

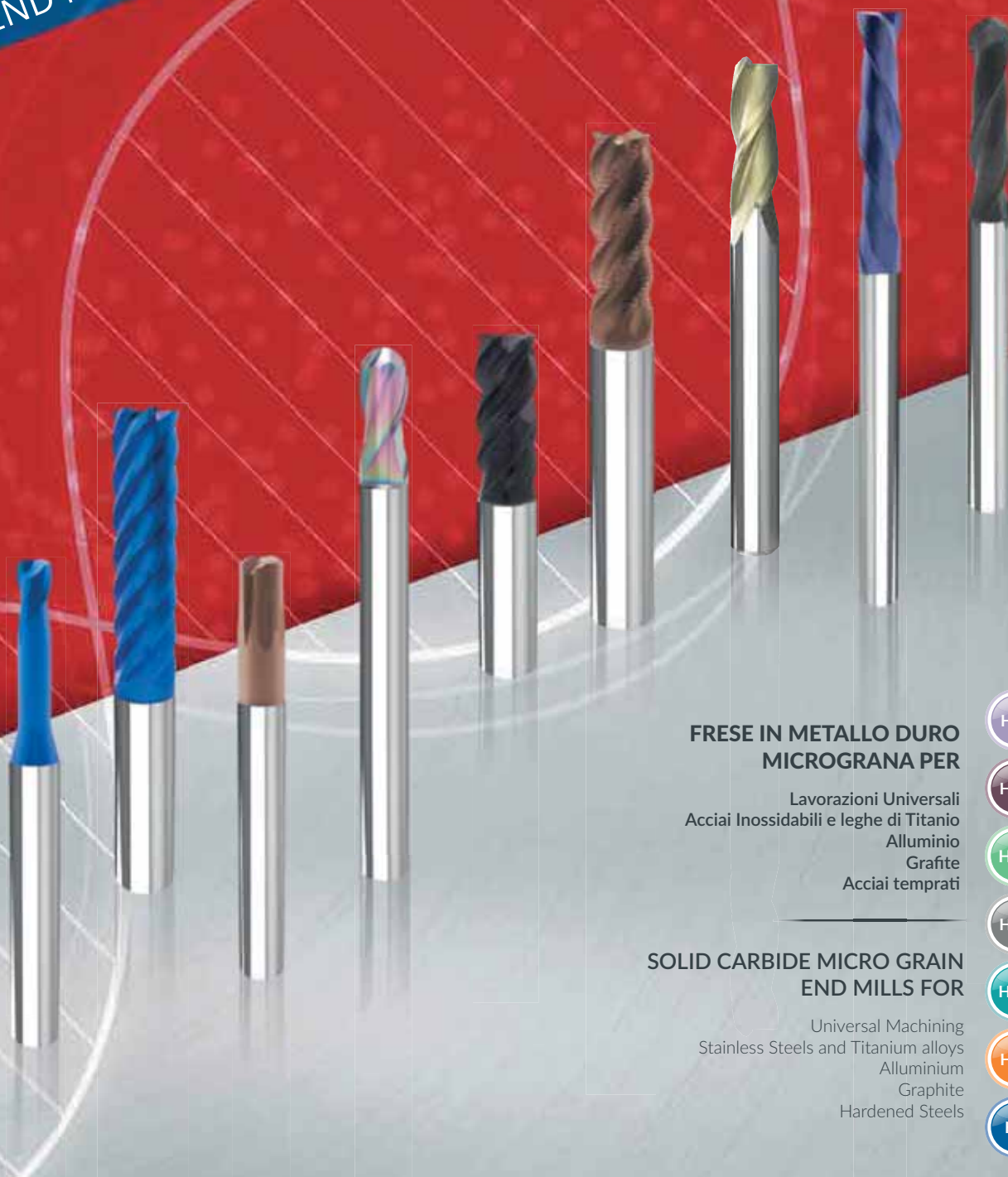


Angelo Ghezzi & C SpA

# FRESE END MILLS

# Evolution

**NEW  
EDITION**



## FRESE IN METALLO DURO MICROGRANA PER

Lavorazioni Universali  
Acciai Inossidabili e leghe di Titanio  
Alluminio  
Grafite  
Acciai temprati

## SOLID CARBIDE MICRO GRAIN END MILLS FOR

Universal Machining  
Stainless Steels and Titanium alloys  
Alluminium  
Graphite  
Hardened Steels

HPF

HPV

HPC

HPX

HPD

HPA

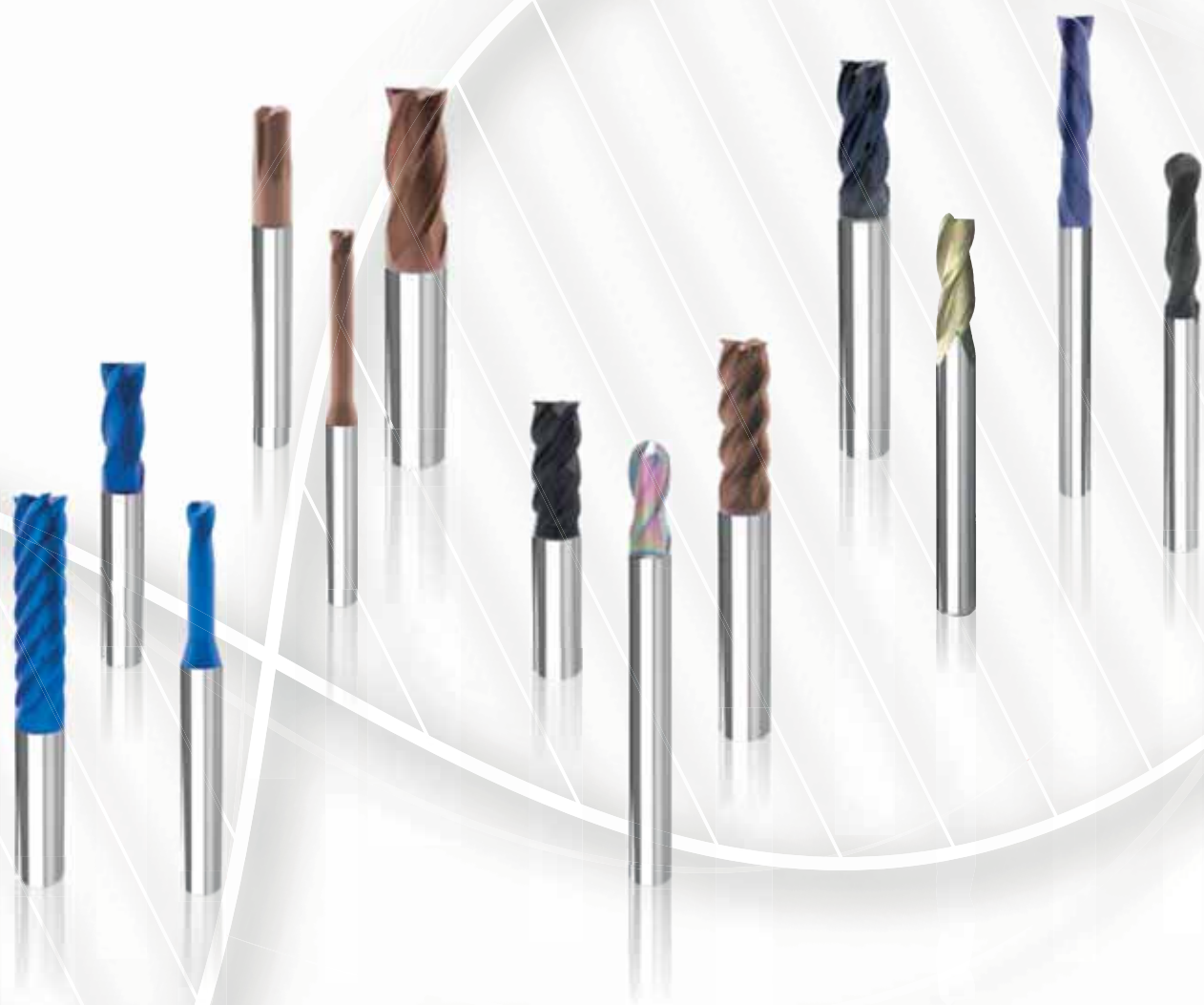
HP

# Talicarb



# **Evolution**

FRESE • END MILLS



**Talicarb**

## IT

La società italiana **TALICARB S.r.l.**, azienda produttiva appartenente al gruppo Angelo Ghezzi & C. Spa dal 1990, è stata oggetto di importanti investimenti non solo in ambito di modernizzazione degli impianti produttivi ma, nel corso degli ultimi anni, sostenuta dalle politiche commerciali del Gruppo Angelo Ghezzi, ha vissuto un forte rilancio sul mercato del proprio marchio TALICARB, intensificando ed ampliando notevolmente la gamma dei prodotti offerti, delineando 4 differenti linee di prodotto:

- Il programma storico di utensili standard in acciaio con riporto in metallo duro saldobrasato. Le soluzioni proposte da Talicarb sono caratterizzate principalmente da prodotti di fresatura ed alesatura.
- Il programma di fresatura in metallo duro integrale, con un'estensione di gamma da Z1 (frese mono-tagliente) fino a soluzioni più avanzate multi-tagliente, è caratterizzato da frese con diverse lunghezze, diverse tipologie di testa (piana o sferica) e differenti geometrie, per soddisfare un ampio range di lavorazioni ed applicazioni. All'interno del programma di fresatura in metallo duro integrale Talicarb è presente inoltre una linea di frese ad alto rendimento "Power" specifica per stampisti.



- Il programma di utensili a fissaggio meccanico, abbinato ad ampia gamma di inserti ISO, nato per soddisfare ogni esigenza di produzione proponendo qualità di metallo duro con triplo strato di rivestimento CVD-PVD, può garantire ottime prestazioni sia in operazioni di sgrossatura che in quelle di finitura.
- Utensili speciali a disegno, a seconda del progetto e dell'esigenza specifica del cliente. In tal senso la flessibilità produttiva dello stabilimento Talicarb risulta essere ad ampio spettro, offrendo soluzioni speciali monolitiche o modulari con qualsiasi tipo di attacco, utensili speciali saldobrasati e utensili speciali a fissaggio meccanico.



## EN

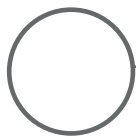
The Italian company **TALICARB Srl**, a production unit belonging to the Angelo Ghezzi & C. Spa group since 1990, has been the subject of important investments not only regarding the modernization of the production plants but, over the last few years, supported by the commercial policies of the Angelo Ghezzi Group experienced a strong relaunch on the market of its TALICARB brand, significantly intensifying and expanding the range of products offered, outlining 4 different product lines:

- The historical program of standard solid carbide brazed tools. The solutions proposed by Talicarb are mainly characterized by milling and reaming products.
- The solid carbide milling program, with a range extension from Z1 (single-edge cutters) to more advanced multi-cutting solutions, is characterized by cutters with different lengths, different types of head (flat or spherical) and different geometries, to satisfy a wide range of processes and applications. Within the Talicarb solid carbide milling

program there is also an high performance line called "Power", with cutters specific for mold makers.

- The program of indexable tools, combined with a wide range of ISO inserts, created to satisfy every production need by offering solid carbide qualities with triple CVD-PVD coating, can guarantee excellent performance in both roughing and finishing.
- Special tools proposed according to drawings, according to the project and the specific needs of the customer. In this sense, the production flexibility of the Talicarb plant is wide-ranging, offering special monolithic or modular solutions with any type of shank, special brazed tools and special tools with indexable inserts.

■ **INDICE GENERALE | GENERAL INDEX**



**Introduzione**  
Introduction

|            |                                                           |              |
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| <b>01.</b> | Guida alla selezione dell'utensile   Tool selection guide | <b>04-15</b> |
| <b>02.</b> | Indice per codice articolo   Index by article code        | <b>16</b>    |



**Frese per lavorazioni universali**  
End mills for universal machining

|            |                                          |              |
|------------|------------------------------------------|--------------|
| <b>01.</b> | Gamma prodotti   Product range           | <b>20-29</b> |
| <b>02.</b> | Parametri di taglio   Cutting parameters | <b>30-33</b> |



**Frese per Acciai Inossidabili e leghe di Titanio**  
End mills for Stainless Steels and Titanium alloys

|            |                                          |              |
|------------|------------------------------------------|--------------|
| <b>01.</b> | Gamma prodotti   Product range           | <b>36-38</b> |
| <b>02.</b> | Parametri di taglio   Cutting parameters | <b>39</b>    |



**Frese per Alluminio**  
End mills for Aluminium

|            |                                          |              |
|------------|------------------------------------------|--------------|
| <b>01.</b> | Gamma prodotti   Product range           | <b>42-43</b> |
| <b>02.</b> | Parametri di taglio   Cutting parameters | <b>44</b>    |



**Frese per Grafite**  
End mills for Graphite

|            |                                          |              |
|------------|------------------------------------------|--------------|
| <b>01.</b> | Gamma prodotti   Product range           | <b>48-56</b> |
| <b>02.</b> | Parametri di taglio   Cutting parameters | <b>57-58</b> |



**Frese per Acciai Temprati ≤55 HRC**  
End mills for Hardened Steels ≤55 HRC

|            |                                          |                |
|------------|------------------------------------------|----------------|
| <b>01.</b> | Gamma prodotti   Product range           | <b>62-102</b>  |
| <b>02.</b> | Parametri di taglio   Cutting parameters | <b>103-109</b> |



**Frese per Acciai Temprati ≤68 HRC**  
End mills for Hardened Steels ≤68 HRC

|            |                                          |                |
|------------|------------------------------------------|----------------|
| <b>01.</b> | Gamma prodotti   Product range           | <b>112-157</b> |
| <b>02.</b> | Parametri di taglio   Cutting parameters | <b>158-166</b> |



**Informazioni**  
Information

|            |                                                      |            |
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| <b>01.</b> | Guida alla lettura   Reading guide                   | <b>170</b> |
| <b>02.</b> | Guida all'ordine   Order Guide                       | <b>171</b> |
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| <b>04.</b> | Gruppo materiali ISO   ISO material group            | <b>173</b> |
| <b>05.</b> | Resistenza e durezza   Tensile strenght and hardness | <b>174</b> |

## ■ Guida alla selezione dell'utensile | Tool selection guide

| <div><div><div>A</div></div></div> <div>Frese per lavorazioni universali<br/>End mills for universal machining</div>                                          | Pagina Catalogo<br>Catalog Page | Codice catalogo<br>Catalog code | Gamma diametri [d mm]<br>Diameter range [d mm] | Angolo Elica [λ]<br>Flute angle [λ] | Angolo di spoglia interna [°]<br>Rake angle [°] | Numero dei denti [Z]<br>No flutes [Z] | Rivestimento utensile<br>Tool coating |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------|------------------------------------------------|-------------------------------------|-------------------------------------------------|---------------------------------------|---------------------------------------|
| ■ TESTA PIANA [divisione irregolare per fresatura trocoidale]   SQUARE [irregular division for trochoidal milling]                                            |                                 |                                 |                                                |                                     |                                                 |                                       |                                       |
|                                                                              | 20                              | 1700HPF                         | 3 ÷ 20                                         | 43°                                 | 2°                                              | 4                                     | HPF                                   |
|                                                                              | 20                              | 1703HPF                         | 3 ÷ 20                                         | 43°                                 | 2°                                              | 4                                     | HPF                                   |
| ■ TESTA PIANA [con disimpegno radiale, divisione irregolare per fresatura trocoidale]   SQUARE [with reduced neck, irregular division for trochoidal milling] |                                 |                                 |                                                |                                     |                                                 |                                       |                                       |
|                                                                             | 21                              | 1705HPF                         | 3 ÷ 20                                         | 45°                                 | 10°                                             | 4                                     | HPF                                   |
|                                                                            | 21                              | 1706HPF                         | 3 ÷ 20                                         | 45°                                 | 10°                                             | 4                                     | HPF                                   |
| ■ TESTA PIANA [elica passo variabile, divisione irregolare]   SQUARE [variable helix, irregular division]                                                     |                                 |                                 |                                                |                                     |                                                 |                                       |                                       |
|                                                                            | 22-23                           | 1707HPF                         | 2 ÷ 20                                         | 38°/41°                             | 12°                                             | 3                                     | HPF                                   |
|                                                                            | 22-23                           | 1708HPF                         | 2 ÷ 20                                         | 38°/41°                             | 12°                                             | 3                                     | HPF                                   |
| ■ TESTA PIANA [elica passo variabile, divisione irregolare]   SQUARE [variable helix, irregular division]                                                     |                                 |                                 |                                                |                                     |                                                 |                                       |                                       |
|                                                                            | 24                              | 1701HPF                         | 3 ÷ 20                                         | 36°/41°                             | 10°                                             | 4                                     | HPF                                   |
| ■ TESTA PIANA [con disimpegno radiale, elica passo variabile, divisione irregolare]   SQUARE [with reduced neck, variable helix, irregular division]          |                                 |                                 |                                                |                                     |                                                 |                                       |                                       |
|  <div>NEW</div>                                                            | 25                              | 1709HPF                         | 3 ÷ 20                                         | 36°/41°                             | 10°                                             | 4                                     | HPF                                   |
| ■ TESTA PIANA [divisione irregolare, rompitrucciolo per sgrossatura]   SQUARE [irregular division, chipbreaker for roughing]                                  |                                 |                                 |                                                |                                     |                                                 |                                       |                                       |
|                                                                            | 26                              | 1702HPF                         | 3 ÷ 20                                         | 38°                                 | 8°                                              | 4                                     | HPF                                   |
|                                                                            | 26                              | 1704HPF                         | 3 ÷ 20                                         | 38°                                 | 8°                                              | 4                                     | HPF                                   |

|  |  |  |  |  |  |  |  |  |  |  |  |                                 |                                 |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------|---------------------------------|
| Cave<br>Slotting                                                                  | Contornatura<br>Side Milling                                                      | Rampa<br>Ramping                                                                  | a Tuffo<br>Plunging                                                               | a Profilare<br>Profiling                                                          | Trocoideale<br>Trochoidal                                                         | Acciai<br>Steels                                                                  | Acciai Inossidabili<br>Stainless Steels                                           | Ghise<br>Cast Irons                                                               | Metalli non ferrosi<br>Non-ferrous metals                                         | Leghe resistenti<br>al calore e Titanio<br>HRSA and Titanium                       | Acciai Temprati<br>Hardened Steels                                                  | Codice catalogo<br>Catalog code | Pagina Catalogo<br>Catalog Page |
| ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | ○                                                                                  | -                                                                                   | 1700HPF                         | 20                              |
| ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | ○                                                                                  | -                                                                                   | 1703HPF                         | 20                              |
| ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                  | -                                                                                   | 1705HPF                         | 21                              |
| ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                  | -                                                                                   | 1706HPF                         | 21                              |
| ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                  | -                                                                                   | 1707HPF                         | 22-23                           |
| ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                  | -                                                                                   | 1708HPF                         | 22-23                           |
| ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                  | -                                                                                   | 1701HPF                         | 24                              |
| ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                  | -                                                                                   | 1709HPF                         | 25                              |
| ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                  | -                                                                                   | 1702HPF                         | 26                              |
| ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                  | -                                                                                   | 1704HPF                         | 26                              |

● **Raccomandato** | Most suitable    ○ **Possibile** | Possible

## ■ Guida alla selezione dell'utensile | Tool selection guide

|                                                                                                                                                                        |                                                |                                                |                                                               |                                                    |                                                                |                                                      |                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------|----------------------------------------------------------------|------------------------------------------------------|------------------------------------------------------|
|  <p><b>Frese per lavorazioni universali</b><br/>End mills for universal machining</p> | <p><b>Pagina Catalogo</b><br/>Catalog Page</p> | <p><b>Codice catalogo</b><br/>Catalog code</p> | <p><b>Gamma diametri [d mm]</b><br/>Diameter range [d mm]</p> | <p><b>Angolo Elica [λ]</b><br/>Flute angle [λ]</p> | <p><b>Angolo di spoglia interna [γ]</b><br/>Rake angle [γ]</p> | <p><b>Numero dei denti [Z]</b><br/>No flutes [Z]</p> | <p><b>Rivestimento utensile</b><br/>Tool coating</p> |
|                                                                                                                                                                        |                                                |                                                |                                                               |                                                    |                                                                |                                                      |                                                      |

### ■ TORICA [con disimpegno radiale, elica passo variabile, divisione irregolare] | CORNER RADIUS [with reduced neck, variable helix, irregular division]

|                                                                                   |            |    |                |        |                    |     |   |     |
|-----------------------------------------------------------------------------------|------------|----|----------------|--------|--------------------|-----|---|-----|
|  | <b>NEW</b> | 27 | <b>1710HPF</b> | 4 ÷ 20 | 36°/38°<br>39°/40° | 12° | 4 | HPF |
|-----------------------------------------------------------------------------------|------------|----|----------------|--------|--------------------|-----|---|-----|

### ■ SFERICA | BALL NOSE

|                                                                                   |            |    |                |        |     |    |   |     |
|-----------------------------------------------------------------------------------|------------|----|----------------|--------|-----|----|---|-----|
|  | <b>NEW</b> | 28 | <b>442RHPF</b> | 1 ÷ 12 | 27° | 4° | 2 | HPF |
|-----------------------------------------------------------------------------------|------------|----|----------------|--------|-----|----|---|-----|

### ■ SFERICA [divisione irregolare] | BALL NOSE [irregular division]

|                                                                                     |            |    |                |        |     |    |   |     |
|-------------------------------------------------------------------------------------|------------|----|----------------|--------|-----|----|---|-----|
|  | <b>NEW</b> | 29 | <b>444RHPF</b> | 2 ÷ 12 | 40° | 4° | 4 | HPF |
|-------------------------------------------------------------------------------------|------------|----|----------------|--------|-----|----|---|-----|

|                                                                                                                                                                                                           |                                                |                                                |                                                               |                                                    |                                                                |                                                      |                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------|----------------------------------------------------------------|------------------------------------------------------|------------------------------------------------------|
|  <p><b>Frese per Acciai Inossidabili e leghe di Titanio</b><br/>End mills for Stainless Steels and Titanium alloys</p> | <p><b>Pagina Catalogo</b><br/>Catalog Page</p> | <p><b>Codice catalogo</b><br/>Catalog code</p> | <p><b>Gamma diametri [d mm]</b><br/>Diameter range [d mm]</p> | <p><b>Angolo Elica [λ]</b><br/>Flute angle [λ]</p> | <p><b>Angolo di spoglia interna [γ]</b><br/>Rake angle [γ]</p> | <p><b>Numero dei denti [Z]</b><br/>No flutes [Z]</p> | <p><b>Rivestimento utensile</b><br/>Tool coating</p> |
|                                                                                                                                                                                                           |                                                |                                                |                                                               |                                                    |                                                                |                                                      |                                                      |

### ■ TESTA PIANA [elica passo variabile] | SQUARE [variable helix]

|                                                                                     |  |    |                |        |         |     |   |     |
|-------------------------------------------------------------------------------------|--|----|----------------|--------|---------|-----|---|-----|
|  |  | 36 | <b>1319HPV</b> | 1 ÷ 12 | 35°/38° | 11° | 4 | HPV |
|-------------------------------------------------------------------------------------|--|----|----------------|--------|---------|-----|---|-----|

### ■ TORICA | CORNER RADIUS [elica passo variabile, divisione irregolare] | SQUARE [variable helix, irregular division]

|                                                                                     |  |       |                |        |         |     |   |     |
|-------------------------------------------------------------------------------------|--|-------|----------------|--------|---------|-----|---|-----|
|  |  | 37-38 | <b>319RHPV</b> | 1 ÷ 12 | 35°/38° | 11° | 4 | HPV |
|-------------------------------------------------------------------------------------|--|-------|----------------|--------|---------|-----|---|-----|

|  |  |  |  |  |  |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Cave<br>Slotting                                                                  | Contornatura<br>Side Milling                                                      | Rampa<br>Ramping                                                                  | a Tuffo<br>Plunging                                                               | A profilare<br>Profiling                                                          | Trocoideale<br>Trochoidal                                                         |
| ●                                                                                 | ●                                                                                 | ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 |
| -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                 | -                                                                                 |
| -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                 | -                                                                                 |

|  |  |  |  |  |  |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Acciai<br>Steels                                                                  | Acciai Inossidabili<br>Stainless Steels                                           | Ghise<br>Cast Irons                                                               | Metalli non ferrosi<br>Non-ferrous metals                                         | Leghe resistenti<br>al calore e Titanio<br>HRSA and Titanium                       | Acciai Temprati<br>Hardened Steels                                                  |
| ●                                                                                 | -                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                  | -                                                                                   |
| ○                                                                                 | ●                                                                                 | ○                                                                                 | -                                                                                 | ●                                                                                  | ●                                                                                   |
| ○                                                                                 | ●                                                                                 | ○                                                                                 | -                                                                                 | ●                                                                                  | ●                                                                                   |

|                                 |         |
|---------------------------------|---------|
| Codice catalogo<br>Catalog code | 1710HPF |
| Pagina Catalogo<br>Catalog Page | 27      |

|                                 |         |
|---------------------------------|---------|
| Codice catalogo<br>Catalog code | 442RHPF |
| Pagina Catalogo<br>Catalog Page | 28      |

|                                 |         |
|---------------------------------|---------|
| Codice catalogo<br>Catalog code | 444RHPF |
| Pagina Catalogo<br>Catalog Page | 29      |

● **Raccomandato** | Most suitable ○ **Possibile** | Possible

|  |  |  |  |  |  |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Cave<br>Slotting                                                                    | Contornatura<br>Side Milling                                                        | Rampa<br>Ramping                                                                    | a Tuffo<br>Plunging                                                                 | A profilare<br>Profiling                                                            | Trocoideale<br>Trochoidal                                                           |
| ●                                                                                   | ●                                                                                   | -                                                                                   | -                                                                                   | -                                                                                   | -                                                                                   |
| ●                                                                                   | ●                                                                                   | -                                                                                   | -                                                                                   | ●                                                                                   | -                                                                                   |

|  |  |  |  |  |  |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Acciai<br>Steels                                                                    | Acciai Inossidabili<br>Stainless Steels                                             | Ghise<br>Cast Irons                                                                 | Metalli non ferrosi<br>Non-ferrous metals                                           | Leghe resistenti<br>al calore e Titanio<br>HRSA and Titanium                         | Acciai Temprati<br>Hardened Steels                                                    |
| -                                                                                   | ●                                                                                   | -                                                                                   | -                                                                                   | ●                                                                                    | -                                                                                     |
| -                                                                                   | ●                                                                                   | -                                                                                   | -                                                                                   | ●                                                                                    | -                                                                                     |

|                                 |         |
|---------------------------------|---------|
| Codice catalogo<br>Catalog code | 1319HPV |
| Pagina Catalogo<br>Catalog Page | 36      |

|                                 |         |
|---------------------------------|---------|
| Codice catalogo<br>Catalog code | 319RHPV |
| Pagina Catalogo<br>Catalog Page | 37-38   |

● **Raccomandato** | Most suitable ○ **Possibile** | Possible

## ■ Guida alla selezione dell'utensile | Tool selection guide

| <br><b>Frese per Alluminio</b><br>End mills for Aluminium | <b>Pagina Catalogo</b><br>Catalog Page | <b>Codice catalogo</b><br>Catalog code | <b>Gamma diametri [d mm]</b><br>Diameter range [d mm] | <b>Angolo Elica [λ]</b><br>Flute angle [λ] | <b>Angolo di spoglia interna [γ]</b><br>Rake angle [γ] | <b>Numero dei denti [Z]</b><br>No flutes [Z] | <b>Rivestimento utensile</b><br>Tool coating |
|--------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------|-------------------------------------------------------|--------------------------------------------|--------------------------------------------------------|----------------------------------------------|----------------------------------------------|
|--------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------|-------------------------------------------------------|--------------------------------------------|--------------------------------------------------------|----------------------------------------------|----------------------------------------------|

### ■ TESTA PIANA [divisione irregolare] | SQUARE [irregular division]

|                                                                                   |    |         |        |     |     |   |     |
|-----------------------------------------------------------------------------------|----|---------|--------|-----|-----|---|-----|
|  | 42 | 1267HPC | 4 ÷ 20 | 44° | 10° | 3 | HPC |
|-----------------------------------------------------------------------------------|----|---------|--------|-----|-----|---|-----|

### ■ TESTA PIANA [con scarico, divisione irregolare] | SQUARE [long neck, irregular division]

|                                                                                   |    |         |        |     |     |   |     |
|-----------------------------------------------------------------------------------|----|---------|--------|-----|-----|---|-----|
|  | 43 | 1268HPC | 4 ÷ 20 | 44° | 10° | 3 | HPC |
|-----------------------------------------------------------------------------------|----|---------|--------|-----|-----|---|-----|

| <br><b>Frese per Grafite</b><br>End mills for Graphite | <b>Pagina Catalogo</b><br>Catalog Page | <b>Codice catalogo</b><br>Catalog code | <b>Gamma diametri [d mm]</b><br>Diameter range [d mm] | <b>Angolo Elica [λ]</b><br>Flute angle [λ] | <b>Angolo di spoglia interna [γ]</b><br>Rake angle [γ] | <b>Numero dei denti [Z]</b><br>No flutes [Z] | <b>Rivestimento utensile</b><br>Tool coating |
|-------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------|-------------------------------------------------------|--------------------------------------------|--------------------------------------------------------|----------------------------------------------|----------------------------------------------|
|-------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------|-------------------------------------------------------|--------------------------------------------|--------------------------------------------------------|----------------------------------------------|----------------------------------------------|

### ■ TESTA PIANA [con scarico] | SQUARE [long neck]

|                                                                                     |       |         |          |     |    |   |     |
|-------------------------------------------------------------------------------------|-------|---------|----------|-----|----|---|-----|
|  | 48-49 | 1402HPX | 0.5 ÷ 12 | 30° | 8° | 2 | HPX |
|-------------------------------------------------------------------------------------|-------|---------|----------|-----|----|---|-----|

### ■ SFERICA [con scarico] | BALL NOSE [long neck]

|                                                                                     |       |         |          |     |     |   |     |
|-------------------------------------------------------------------------------------|-------|---------|----------|-----|-----|---|-----|
|  | 50-51 | 402RHPX | 0.5 ÷ 12 | 30° | 8°  | 2 | HPX |
|  | 52-54 | 422RHPD | 0.5 ÷ 12 | 30° | 10° | 2 | HPD |
|  | 55-56 | 424RHPD | 1.5 ÷ 12 | 30° | 10° | 4 | HPD |

|  |  |  |  |  |  |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Cave<br>Slotting                                                                  | Contornatura<br>Side Milling                                                      | Rampa<br>Ramping                                                                  | a Tuffo<br>Plunging                                                               | A profilare<br>Profiling                                                          | Trocodale<br>Trochoidal                                                           |
| ●                                                                                 | ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 |
| ●                                                                                 | ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 |

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|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Acciai<br>Steels                                                                  | Acciai Inossidabili<br>Stainless Steels                                           | Ghise<br>Cast Irons                                                               | Metalli non ferrosi<br>Non-ferrous metals                                         | Leghe resistenti<br>al calore e Titanio<br>HRSA and Titanium                       | Acciai Temprati<br>Hardened Steels                                                  |
| -                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                 | -                                                                                  | -                                                                                   |
| -                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                 | -                                                                                  | -                                                                                   |

|                |    |
|----------------|----|
| <b>1267HPC</b> | 42 |
| <b>1268HPC</b> | 43 |

● **Raccomandato** | Most suitable ○ **Possibile** | Possible

|  |  |  |  |  |  |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Cave<br>Slotting                                                                    | Contornatura<br>Side Milling                                                        | Rampa<br>Ramping                                                                    | a Tuffo<br>Plunging                                                                 | A profilare<br>Profiling                                                            | Trocodale<br>Trochoidal                                                             |
| ●                                                                                   | ●                                                                                   | -                                                                                   | -                                                                                   | -                                                                                   | -                                                                                   |
| -                                                                                   | -                                                                                   | -                                                                                   | -                                                                                   | ●                                                                                   | -                                                                                   |
| -                                                                                   | -                                                                                   | -                                                                                   | -                                                                                   | ●                                                                                   | -                                                                                   |
| -                                                                                   | -                                                                                   | -                                                                                   | -                                                                                   | ●                                                                                   | -                                                                                   |

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|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Acciai<br>Steels                                                                    | Acciai Inossidabili<br>Stainless Steels                                             | Ghise<br>Cast Irons                                                                 | Metalli non ferrosi<br>Non-ferrous metals                                           | Leghe resistenti<br>al calore e Titanio<br>HRSA and Titanium                         | Acciai Temprati<br>Hardened Steels                                                    |
| -                                                                                   | -                                                                                   | -                                                                                   | -                                                                                   | -                                                                                    | ●                                                                                     |
| -                                                                                   | -                                                                                   | -                                                                                   | -                                                                                   | -                                                                                    | ●                                                                                     |
| -                                                                                   | -                                                                                   | -                                                                                   | -                                                                                   | -                                                                                    | ●                                                                                     |
| -                                                                                   | -                                                                                   | -                                                                                   | -                                                                                   | -                                                                                    | ●                                                                                     |

|                |       |
|----------------|-------|
| <b>1402HPX</b> | 48-49 |
| <b>402RHPX</b> | 50-51 |
| <b>422RHDP</b> | 52-54 |
| <b>424RHDP</b> | 55-56 |

● **Raccomandato** | Most suitable ○ **Possibile** | Possible

## ■ Guida alla selezione dell'utensile | Tool selection guide

| <br><b>Frese per Acciai Temprati ≤55 HRC</b><br>End mills for Hardened Steels ≤55 HRC                                                                                                                     | Pagina Catalogo<br>Catalog Page | Codice catalogo<br>Catalog code | Gamma diametri [d mm]<br>Diameter range [d mm] | Angolo Elica [λ]<br>Flute angle [λ] | Angolo di spoglia interna [γ]<br>Rake angle [γ] | Numero dei denti [Z]<br>No flutes [Z] | Rivestimento utensile<br>Tool coating |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------|------------------------------------------------|-------------------------------------|-------------------------------------------------|---------------------------------------|---------------------------------------|
|                                                                                                                                                                                                                                                                                            |                                 |                                 |                                                |                                     |                                                 |                                       |                                       |
| <b>TESTA PIANA   SQUARE</b><br><br><br> | 62-63                           | <b>1412HPA</b>                  | 0.2 ÷ 20                                       | 30°                                 | 2,2°                                            | 2                                     | HPA                                   |
|                                                                                                                                                                                                                                                                                            | 64-65                           | <b>1414HPA</b>                  | 1 ÷ 20                                         | 30°                                 | 2,2°                                            | 4                                     | HPA                                   |
|                                                                                                                                                                                                                                                                                            | 66-67                           | <b>1360HPA</b>                  | 6 ÷ 20                                         | 45°                                 | 2,2°                                            | 6                                     | HPA                                   |
| <b>TESTA PIANA [con scarico]   SQUARE [long neck]</b><br>                                                                                                                                               | 68-72                           | <b>1430HPA</b>                  | 0.1 ÷ 8                                        | 30°                                 | 2,2°                                            | 2                                     | HPA                                   |
| <b>TESTA PIANA [serie lunga]   SQUARE [long series]</b><br>                                                                                                                                             | 73-74                           | <b>1414LHPA</b>                 | 2 ÷ 20                                         | 30°                                 | 3,2°                                            | 4                                     | HPA                                   |
| <b>TORICA   CORNER RADIUS</b><br><br>                                                                                | 75                              | <b>1440HPA</b>                  | 6 ÷ 12                                         | 0°                                  | 0°                                              | 4                                     | HPA                                   |
|                                                                                                                                                                                                                                                                                            | 76-77                           | <b>1434HPA</b>                  | 1.5 ÷ 12                                       | 30°                                 | 3,2°                                            | 4                                     | HPA                                   |
| <b>TORICA [con scarico]   CORNER RADIUS [long neck]</b><br><br>                                                      | 78-87                           | <b>1433HPA</b>                  | 0.2 ÷ 12                                       | 30°                                 | 2,2°                                            | 2                                     | HPA                                   |
|                                                                                                                                                                                                                                                                                            | 88-94                           | <b>14334HPA</b>                 | 1 ÷ 12                                         | 30°                                 | 3,2°                                            | 4                                     | HPA                                   |

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|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------|---------------------------------|
| Cave<br>Slotting                                                                  | Contornatura<br>Side Milling                                                      | Rampa<br>Ramping                                                                  | a Tuffo<br>Plunging                                                               | A profilare<br>Profiling                                                          | Trocodale<br>Trochoidal                                                           | Acciai<br>Steels                                                                  | Acciai Inossidabili<br>Stainless Steels                                           | Ghise<br>Cast Irons                                                               | Metalli non ferrosi<br>Non-ferrous metals                                         | Leghe resistenti<br>al calore e Titanio<br>HRSA and Titanium                       | Acciai Temprati<br>Hardened Steels                                                  | Codice catalogo<br>Catalog code | Pagina Catalogo<br>Catalog Page |
| ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | ○                                                                                 | ○                                                                                 | ○                                                                                 | -                                                                                 | ○                                                                                  | ●                                                                                   | 1412HPA                         | 62-63                           |
| ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | ○                                                                                 | ○                                                                                 | ○                                                                                 | -                                                                                 | ○                                                                                  | ●                                                                                   | 1414HPA                         | 64-65                           |
| ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | ○                                                                                 | ○                                                                                 | ○                                                                                 | -                                                                                 | ○                                                                                  | ●                                                                                   | 1360HPA                         | 66-67                           |
| ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | ○                                                                                 | ○                                                                                 | ○                                                                                 | -                                                                                 | ○                                                                                  | ●                                                                                   | 1430HP                          | 68-72                           |
| ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | ○                                                                                 | ○                                                                                 | ○                                                                                 | -                                                                                 | ○                                                                                  | ●                                                                                   | 1414LHPA                        | 73-74                           |
| ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                 | -                                                                                 | ○                                                                                 | ○                                                                                 | ○                                                                                 | -                                                                                 | ○                                                                                  | ●                                                                                   | 1440HPA                         | 75                              |
| ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                 | -                                                                                 | ○                                                                                 | ○                                                                                 | ○                                                                                 | -                                                                                 | ○                                                                                  | ●                                                                                   | 1434HPA                         | 76-77                           |
| ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                 | -                                                                                 | ○                                                                                 | ○                                                                                 | ○                                                                                 | -                                                                                 | ○                                                                                  | ●                                                                                   | 1433HPA                         | 78-87                           |
| ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                 | -                                                                                 | ○                                                                                 | ○                                                                                 | ○                                                                                 | -                                                                                 | ○                                                                                  | ●                                                                                   | 14334HPA                        | 88-94                           |

● **Raccomandato** | Most suitable ○ **Possibile** | Possible

## ■ Guida alla selezione dell'utensile | Tool selection guide

| <br><b>Frese per Acciai Temprati ≤55 HRC</b><br>End mills for Hardened Steels ≤55 HRC                                                                                                                                                                                                                             | <b>Pagina Catalogo</b><br>Catalog Page | <b>Codice catalogo</b><br>Catalog code | <b>Gamma diametri [d mm]</b><br>Diameter range [d mm] | <b>Angolo Elica [λ]</b><br>Flute angle [λ] | <b>Angolo di spoglia interna [γ]</b><br>Rake angle [γ] | <b>Numero dei denti [Z]</b><br>No flutes [Z] | <b>Rivestimento utensile</b><br>Tool coating |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------|-------------------------------------------------------|--------------------------------------------|--------------------------------------------------------|----------------------------------------------|----------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                    |                                        |                                        |                                                       |                                            |                                                        |                                              |                                              |
| <b>SFERICA   BALL NOSE</b><br>                                                                                                                                                                                                                                                                                    | 95-96                                  | 416RHPA                                | 0.2 ÷ 20                                              | 30°                                        | 2,2°                                                   | 2                                            | HPA                                          |
|                                                                                                                                                                                                                                                                                                                                                                                                    |                                        |                                        |                                                       |                                            |                                                        |                                              |                                              |
| <b>SFERICA [con scarico]   BALL NOSE [long neck]</b><br>                                                                                                                                                                                                                                                          | 97-102                                 | 431RHPA                                | 0.2 ÷ 12                                              | 30°                                        | 2,2°                                                   | 2                                            | HPA                                          |
| <br><b>Frese per Acciai Temprati ≤68 HRC</b><br>End mills for Hardened Steels ≤68 HRC                                                                                                                                                                                                                           | <b>Pagina Catalogo</b><br>Catalog Page | <b>Codice catalogo</b><br>Catalog code | <b>Gamma diametri [d mm]</b><br>Diameter range [d mm] | <b>Angolo Elica [λ]</b><br>Flute angle [λ] | <b>Angolo di spoglia interna [γ]</b><br>Rake angle [γ] | <b>Numero dei denti [Z]</b><br>No flutes [Z] | <b>Rivestimento utensile</b><br>Tool coating |
|                                                                                                                                                                                                                                                                                                                                                                                                    |                                        |                                        |                                                       |                                            |                                                        |                                              |                                              |
| <b>TESTA PIANA   SQUARE</b><br><br><br> <b>NEW</b><br> | 112-113                                | 1412HP                                 | 0.2 ÷ 12                                              | 30°                                        | 1,4°                                                   | 2                                            | HP                                           |
|                                                                                                                                                                                                                                                                                                                                                                                                    | 114-115                                | 1414HP                                 | 1 ÷ 12                                                | 30°                                        | 2,8°                                                   | 4                                            | HP                                           |
|                                                                                                                                                                                                                                                                                                                                                                                                    | 116-117                                | 14145HP                                | 1 ÷ 20                                                | 45°                                        | 2,8°                                                   | 4                                            | HP                                           |
|                                                                                                                                                                                                                                                                                                                                                                                                    | 118-119                                | 1416HP                                 | 6 ÷ 20                                                | 45°                                        | 2,4°                                                   | 6                                            | HP                                           |
| <b>TESTA PIANA [con scarico]   SQUARE [long neck]</b><br>                                                                                                                                                                                                                                                       | 120-124                                | 1430HP                                 | 0.1 ÷ 8                                               | 30°                                        | 1,4°                                                   | 2                                            | HP                                           |

|  |  |  |  |  |  |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Cave<br>Slotting                                                                  | Contornatura<br>Side Milling                                                      | Rampa<br>Ramping                                                                  | a Tuffo<br>Plunging                                                               | A profilare<br>Profiling                                                          | Trocoideale<br>Trochoidal                                                         |
| -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                 | -                                                                                 |
| -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                 | -                                                                                 |

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|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Acciai<br>Steels                                                                  | Acciai Inossidabili<br>Stainless Steels                                           | Ghise<br>Cast Irons                                                               | Metalli non ferrosi<br>Non-ferrous metals                                         | Leghe resistenti<br>al calore e Titanio<br>HRSA and Titanium                       | Acciai Temprati<br>Hardened Steels                                                  |
| ○                                                                                 | ○                                                                                 | ○                                                                                 | -                                                                                 | ○                                                                                  | ●                                                                                   |
| ○                                                                                 | ○                                                                                 | ○                                                                                 | -                                                                                 | ○                                                                                  | ●                                                                                   |

| Codice catalogo<br>Catalog code | Pagina Catalogo<br>Catalog Page |
|---------------------------------|---------------------------------|
| 416RHPA                         | 95-96                           |
| 431RHPA                         | 97-102                          |

● **Raccomandato** | Most suitable ○ **Possibile** | Possible

|  |  |  |  |  |  |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Cave<br>Slotting                                                                    | Contornatura<br>Side Milling                                                        | Rampa<br>Ramping                                                                    | a Tuffo<br>Plunging                                                                 | A profilare<br>Profiling                                                            | Trocoideale<br>Trochoidal                                                           |
| ●                                                                                   | ●                                                                                   | -                                                                                   | -                                                                                   | -                                                                                   | -                                                                                   |
| ●                                                                                   | ●                                                                                   | -                                                                                   | -                                                                                   | -                                                                                   | -                                                                                   |
| ●                                                                                   | ●                                                                                   | -                                                                                   | -                                                                                   | -                                                                                   | -                                                                                   |
| ●                                                                                   | ●                                                                                   | -                                                                                   | -                                                                                   | -                                                                                   | -                                                                                   |
| ●                                                                                   | ●                                                                                   | -                                                                                   | -                                                                                   | -                                                                                   | -                                                                                   |

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|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Acciai<br>Steels                                                                    | Acciai Inossidabili<br>Stainless Steels                                             | Ghise<br>Cast Irons                                                                 | Metalli non ferrosi<br>Non-ferrous metals                                           | Leghe resistenti<br>al calore e Titanio<br>HRSA and Titanium                         | Acciai Temprati<br>Hardened Steels                                                    |
| ○                                                                                   | -                                                                                   | ○                                                                                   | -                                                                                   | -                                                                                    | ●                                                                                     |
| ○                                                                                   | -                                                                                   | ○                                                                                   | -                                                                                   | -                                                                                    | ●                                                                                     |
| ○                                                                                   | -                                                                                   | ○                                                                                   | -                                                                                   | -                                                                                    | ●                                                                                     |
| ○                                                                                   | -                                                                                   | ○                                                                                   | -                                                                                   | -                                                                                    | ●                                                                                     |
| ○                                                                                   | -                                                                                   | ○                                                                                   | -                                                                                   | -                                                                                    | ●                                                                                     |

| Codice catalogo<br>Catalog code | Pagina Catalogo<br>Catalog Page |
|---------------------------------|---------------------------------|
| 1412HP                          | 112-113                         |
| 1414HP                          | 114-115                         |
| 14145HP                         | 116-117                         |
| 1416HP                          | 118-119                         |
| 1430HP                          | 120-124                         |

● **Raccomandato** | Most suitable ○ **Possibile** | Possible

## ■ Guida alla selezione dell'utensile | Tool selection guide

| <br><b>Frese per Acciai Temprati ≤68 HRC</b><br>End mills for Hardened Steels ≤68 HRC | Pagina Catalogo<br>Catalog Page | Codice catalogo<br>Catalog code |                                                |                                     |                                                 |                                       |                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------|------------------------------------------------|-------------------------------------|-------------------------------------------------|---------------------------------------|---------------------------------------|
|                                                                                                                                                                        |                                 |                                 | Gamma diametri [d mm]<br>Diameter range [d mm] | Angolo Elica [λ]<br>Flute angle [λ] | Angolo di spoglia interna [γ]<br>Rake angle [γ] | Numero dei denti [Z]<br>No flutes [Z] | Rivestimento utensile<br>Tool coating |
| <b>TORICA   CORNER RADIUS</b><br>                                                     | 125-126                         | 1432HP                          | 0.8 ÷ 12                                       | 30°                                 | 1,4°                                            | 2                                     | HP                                    |
|                                                                                                                                                                        | 127-128                         | 1434HP                          | 1.5 ÷ 12                                       | 30°                                 | 2,8°                                            | 4                                     | HP                                    |
| <b>TORICA [con scarico]   CORNER RADIUS [long neck]</b><br>                          | 129-138                         | 1433HP                          | 0.2 ÷ 12                                       | 30°                                 | 1,4°                                            | 2                                     | HP                                    |
|                                                                                                                                                                        | 139-144                         | 14334HP                         | 1 ÷ 12                                         | 30°                                 | 2,8°                                            | 4                                     | HP                                    |
| <b>SFERICA   BALL NOSE</b><br>                                                      | 145-146                         | 416RHP                          | 0.2 ÷ 12                                       | 30°                                 | 1,4°                                            | 2                                     | HP                                    |
| <b>SFERICA [con scarico]   BALL NOSE [long neck]</b><br>                            | 147-152                         | 431RHP                          | 0.2 ÷ 12                                       | 30°                                 | 1,4°                                            | 2                                     | HP                                    |
| <b>SFERICA [con scarico conico]   BALL NOSE [tapered neck]</b><br>                  | 153-157                         | 430RHP                          | 0.5 ÷ 4                                        | 30°                                 | 1,2°                                            | 2                                     | HP                                    |

|  |  |  |  |  |  |  |  |  |  |  |  |                                 |                                 |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------|---------------------------------|
| Cave<br>Slotting                                                                  | Contornatura<br>Side Milling                                                      | Rampa<br>Ramping                                                                  | a Tuffo<br>Plunging                                                               | A profilare<br>Profiling                                                          | Trocoideale<br>Trochoidal                                                         | Acciai<br>Steels                                                                  | Acciai Inossidabili<br>Stainless Steels                                           | Ghise<br>Cast Irons                                                               | Metalli non ferrosi<br>Non-ferrous metals                                         | Leghe resistenti<br>al calore e Titanio<br>HRSA and Titanium                       | Acciai Temprati<br>Hardened Steels                                                  | Codice catalogo<br>Catalog code | Pagina Catalogo<br>Catalog Page |
| ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                 | -                                                                                 | ○                                                                                 | -                                                                                 | ○                                                                                 | -                                                                                 | -                                                                                  | ●                                                                                   | 1432HP                          | 125-126                         |
| ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                 | -                                                                                 | ○                                                                                 | -                                                                                 | ○                                                                                 | -                                                                                 | -                                                                                  | ●                                                                                   | 1434HP                          | 127-128                         |
| ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                 | -                                                                                 | ○                                                                                 | -                                                                                 | ○                                                                                 | -                                                                                 | -                                                                                  | ●                                                                                   | 1433HP                          | 129-138                         |
| ●                                                                                 | ●                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                 | -                                                                                 | ○                                                                                 | -                                                                                 | ○                                                                                 | -                                                                                 | -                                                                                  | ●                                                                                   | 14334HP                         | 139-144                         |
| -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                 | -                                                                                 | ○                                                                                 | -                                                                                 | ○                                                                                 | -                                                                                 | -                                                                                  | ●                                                                                   | 416RHP                          | 145-146                         |
| -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                 | -                                                                                 | ○                                                                                 | -                                                                                 | ○                                                                                 | -                                                                                 | -                                                                                  | ●                                                                                   | 431RHP                          | 147-152                         |
| -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | ●                                                                                 | -                                                                                 | ○                                                                                 | -                                                                                 | ○                                                                                 | -                                                                                 | -                                                                                  | ●                                                                                   | 430RHP                          | 153-157                         |

● **Raccomandato** | Most suitable ○ **Possibile** | Possible

## ■ Indice per codice articolo | Index by article code

| Codice Catalogo<br>Catalog Code | Sezione<br>Section | Status | Pagina Catalogo<br>Catalog page |
|---------------------------------|--------------------|--------|---------------------------------|
| 319RHPV                         | B   HPV            |        | 37-38                           |
| 402RHPX                         | D   HPX            |        | 50-51                           |
| 416RHP                          | F   HP             |        | 145-146                         |
| 416RHPA                         | E   HPA            |        | 95-96                           |
| 422RHPD                         | D   HPD            |        | 52-54                           |
| 424RHPD                         | D   HPD            |        | 55-56                           |
| 430RHP                          | F   HP             |        | 153-157                         |
| 431RHP                          | F   HP             |        | 147-152                         |
| 431RHPA                         | E   HPA            |        | 97-102                          |
| 442RHPF                         | A   HPF            | NEW    | 28                              |
| 444RHPF                         | A   HPF            | NEW    | 29                              |
| 1267HPC                         | C   HPC            |        | 42                              |
| 1268HPC                         | C   HPC            |        | 43                              |
| 1319HPV                         | B   HPV            |        | 36                              |
| 1360HPA                         | E   HPA            |        | 66-67                           |
| 1402HPX                         | D   HPX            |        | 48-49                           |
| 1412HP                          | F   HP             |        | 112-113                         |
| 1412HPA                         | E   HPA            |        | 62-63                           |
| 14145HP                         | F   HP             | NEW    | 116-117                         |
| 1414HP                          | F   HP             |        | 114-115                         |
| 1414HPA                         | E   HPA            |        | 64-65                           |
| 1414LHPA                        | E   HPA            |        | 73-74                           |

| Codice Catalogo<br>Catalog Code | Sezione<br>Section | Status | Pagina Catalogo<br>Catalog page |
|---------------------------------|--------------------|--------|---------------------------------|
| 1416HP                          | F   HP             |        | 118-119                         |
| 1430HP                          | F   HP             |        | 120-124                         |
| 1430HPA                         | E   HPA            |        | 68-72                           |
| 1432HP                          | F   HP             |        | 125-126                         |
| 14334HP                         | F   HP             |        | 139-144                         |
| 14334HPA                        | E   HPA            |        | 88-94                           |
| 1433HP                          | F   HP             |        | 129-138                         |
| 1433HPA                         | E   HPA            |        | 78-87                           |
| 1434HP                          | F   HP             |        | 127-128                         |
| 1434HPA                         | E   HPA            |        | 76-77                           |
| 1440HPA                         | E   HPA            |        | 75                              |
| 1700HPF                         | A   HPF            |        | 20                              |
| 1701HPF                         | A   HPF            |        | 24                              |
| 1702HPF                         | A   HPF            |        | 26                              |
| 1703HPF                         | A   HPF            |        | 20                              |
| 1704HPF                         | A   HPF            |        | 26                              |
| 1705HPF                         | A   HPF            |        | 21                              |
| 1706HPF                         | A   HPF            |        | 21                              |
| 1707HPF                         | A   HPF            |        | 22-23                           |
| 1708HPF                         | A   HPF            |        | 22-23                           |
| 1709HPF                         | A   HPF            | NEW    | 25                              |
| 1710HPF                         | A   HPF            | NEW    | 27                              |





 **Evolution**  
FRESE • END MILLS

**Talicarb**



**FRESE PER LAVORAZIONI UNIVERSALI**  
End Mills for universal machining

# 1700HPF - 1703HPF

**Talicarb**

Frese a testa piana in metallo duro integrale micrograna, divisione irregolare per fresature trocoidali.  
Square end mills in solid carbide micro grain, irregular division for trochoidal milling.

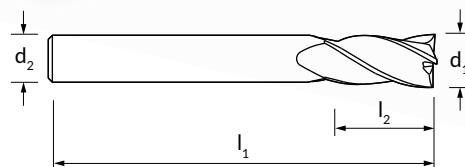
|                                                                                               |                                                                                                 |                                                                                           |                                                                                          |                                                                                                     |
|-----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| <br>TiAlN-Si | <br>Z4         | <br>λ43° | <br>γ2° | <br>α1, α2, α3, α4 |
| <br>h6       | <br>SHRINK FIT | -                                                                                         | <br>P30 | <br>P170           |

## Operazioni di fresatura | Milling strategies:



## Gruppo materiali lavorabili | Group of working materials:

| P                                                                                 | M                                                                                 | K | N | S                                                                                 | H |                                                          |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---|---|-----------------------------------------------------------------------------------|---|----------------------------------------------------------|
|  |  | - | - |  | - | ● Raccomandato - Most suitable<br>○ Possibile - Possible |



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø          | Raggio   Radius |
|----------------------------------|-----------------|
| d ≤ 6: 0/-0.01   d > 6: 0/-0.015 | -               |

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |

|    |     |    |    |
|----|-----|----|----|
| 3  | 57  | 8  | 6  |
| 4  | 57  | 11 | 6  |
| 5  | 57  | 13 | 6  |
| 6  | 57  | 13 | 6  |
| 8  | 64  | 21 | 8  |
| 10 | 72  | 22 | 10 |
| 12 | 83  | 26 | 12 |
| 16 | 92  | 36 | 16 |
| 20 | 104 | 41 | 20 |

| 1700HPF   |                                                                                     |                               |
|-----------|-------------------------------------------------------------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code                                                       | Prezzo utensile<br>Tool Price |
|           |  | €                             |

|        |            |
|--------|------------|
| 441523 | 1700HPF 3  |
| 441524 | 1700HPF 4  |
| 441525 | 1700HPF 5  |
| 441526 | 1700HPF 6  |
| 441527 | 1700HPF 8  |
| 441528 | 1700HPF 10 |
| 441529 | 1700HPF 12 |
| 441530 | 1700HPF 16 |
| 441531 | 1700HPF 20 |

| 1703HPF   |                                                                                       |                               |
|-----------|---------------------------------------------------------------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code                                                         | Prezzo utensile<br>Tool Price |
|           |  | €                             |

|        |            |
|--------|------------|
| 442709 | 1703HPF 3  |
| 442710 | 1703HPF 4  |
| 442711 | 1703HPF 5  |
| 442712 | 1703HPF 6  |
| 442713 | 1703HPF 8  |
| 442714 | 1703HPF 10 |
| 442715 | 1703HPF 12 |
| 442716 | 1703HPF 16 |
| 442717 | 1703HPF 20 |

# 1705HPF - 1706HPF

**Talicarb**

Frese a testa piana con disimpegno radiale in M.D.I. micrograna, divisione irregolare per fresature trocoidali.  
Square end mills with reduced neck in solid carbide micro grain, irregular division for trochoidal milling.

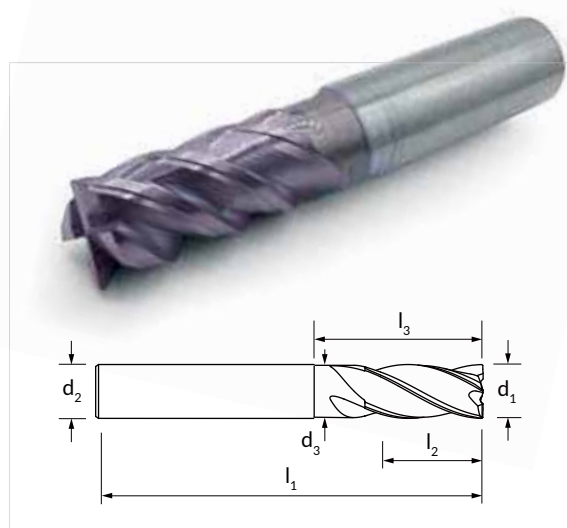
|                                                                                               |                                                                                                 |                                                                                           |                                                                                           |                                                                                                  |
|-----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| <br>TiAlN Si | <br>Z4         | <br>λ45° | <br>γ10° | <br>α1 α2 α3 α4 |
| <br>h6       | <br>SHRINK FIT | -                                                                                         | <br>P30  | <br>P170        |

## Operazioni di fresatura | Milling strategies:

|                                                                                   |                                                                                   |   |   |   |                                                                                   |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---|---|---|-----------------------------------------------------------------------------------|
|  |  | - | - | - |  |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---|---|---|-----------------------------------------------------------------------------------|

## Gruppo materiali lavorabili | Group of working materials:

| P                                                                                 | M                                                                                 | K | N | S                                                                                 | H |                                                          |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---|---|-----------------------------------------------------------------------------------|---|----------------------------------------------------------|
|  |  | - | - |  | - | ● Raccomandato - Most suitable<br>○ Possibile - Possible |



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø          | Raggio   Radius |
|----------------------------------|-----------------|
| d ≤ 6: 0/-0.01   d > 6: 0/-0.015 | -               |

| Diametro resa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter |
|------------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|
| d <sub>1</sub>                     | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  |

|    |     |    |    |    |     |
|----|-----|----|----|----|-----|
| 3  | 57  | 7  | 13 | 6  | 2,8 |
| 4  | 57  | 8  | 16 | 6  | 3,7 |
| 5  | 57  | 10 | 18 | 6  | 4,6 |
| 6  | 57  | 10 | 20 | 6  | 5,5 |
| 8  | 63  | 16 | 26 | 8  | 7,4 |
| 10 | 72  | 19 | 31 | 10 | 9,2 |
| 12 | 83  | 24 | 37 | 12 | 11  |
| 16 | 92  | 32 | 43 | 16 | 15  |
| 20 | 104 | 39 | 53 | 20 | 19  |

| 1705HPF   |                                                                                     |                               |
|-----------|-------------------------------------------------------------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code                                                       | Prezzo utensile<br>Tool Price |
|           |  | €                             |

|        |            |
|--------|------------|
| 445964 | 1705HPF 3  |
| 445965 | 1705HPF 4  |
| 445966 | 1705HPF 5  |
| 445967 | 1705HPF 6  |
| 445968 | 1705HPF 8  |
| 445969 | 1705HPF 10 |
| 445970 | 1705HPF 12 |
| 445971 | 1705HPF 16 |
| 445972 | 1705HPF 20 |

| 1706HPF   |                                                                                       |                               |
|-----------|---------------------------------------------------------------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code                                                         | Prezzo utensile<br>Tool Price |
|           |  | €                             |

|        |            |
|--------|------------|
| 445973 | 1706HPF 3  |
| 445974 | 1706HPF 4  |
| 445975 | 1706HPF 5  |
| 445976 | 1706HPF 6  |
| 445977 | 1706HPF 8  |
| 445978 | 1706HPF 10 |
| 445979 | 1706HPF 12 |
| 445980 | 1706HPF 16 |
| 445981 | 1706HPF 20 |

Per lavorazioni universali  
For universal machining

# 1707HPF - 1708HPF

**Talicarb**

**Frese a testa piana in metallo duro integrale micrograna, elica passo variabile, divisione irregolare.**  
Square end mills in solid carbide micro grain, variable helix, irregular division.

|                                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| <br>TiAlNsi |  |  |  |  |
|             |  | -                                                                                 |  |  |

## Operazioni di fresatura | Milling strategies:

|                                                                                   |                                                                                   |   |   |   |   |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---|---|---|---|
|  |  | - | - | - | - |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---|---|---|---|

## Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |                                                          |
|---|---|---|---|---|---|----------------------------------------------------------|
| ● | ● | ● | - | - | - | ● Raccomandato - Most suitable<br>○ Possibile - Possible |



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø      | Raggio   Radius |
|------------------------------|-----------------|
| d≤6: 0/-0.01   d>6: 0/-0.015 | -               |

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |

|     |    |    |    |
|-----|----|----|----|
| 2   | 54 | 6  | 6  |
| 2.5 | 54 | 6  | 6  |
| 3   | 57 | 7  | 6  |
| 3.5 | 57 | 7  | 6  |
| 4   | 57 | 8  | 6  |
| 4.5 | 57 | 8  | 6  |
| 5   | 57 | 10 | 6  |
| 5.5 | 57 | 10 | 6  |
| 6   | 57 | 10 | 6  |
| 6.5 | 63 | 13 | 8  |
| 7   | 63 | 13 | 8  |
| 7.5 | 63 | 16 | 8  |
| 8   | 63 | 16 | 8  |
| 8.5 | 72 | 16 | 10 |
| 9   | 72 | 16 | 10 |
| 9.5 | 72 | 19 | 10 |
| 10  | 72 | 19 | 10 |
| 11  | 83 | 22 | 12 |

| 1707HPF   |                                                                                     |                               |
|-----------|-------------------------------------------------------------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code                                                       | Prezzo utensile<br>Tool Price |
|           |  | €                             |

|        |             |
|--------|-------------|
| 445982 | 1707HPF 2   |
| 445983 | 1707HPF 2.5 |
| 445984 | 1707HPF 3   |
| 445985 | 1707HPF 3.5 |
| 445986 | 1707HPF 4   |
| 445987 | 1707HPF 4.5 |
| 445988 | 1707HPF 5   |
| 445989 | 1707HPF 5.5 |
| 445990 | 1707HPF 6   |
| 445991 | 1707HPF 6.5 |
| 445992 | 1707HPF 7   |
| 445993 | 1707HPF 7.5 |
| 445994 | 1707HPF 8   |
| 445995 | 1707HPF 8.5 |
| 445996 | 1707HPF 9   |
| 445997 | 1707HPF 9.5 |
| 445998 | 1707HPF 10  |
| 445999 | 1707HPF 11  |

| 1708HPF   |                                                                                       |                               |
|-----------|---------------------------------------------------------------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code                                                         | Prezzo utensile<br>Tool Price |
|           |  | €                             |

|        |             |
|--------|-------------|
| 446006 | 1708HPF 2   |
| 446007 | 1708HPF 2.5 |
| 446008 | 1708HPF 3   |
| 446009 | 1708HPF 3.5 |
| 446010 | 1708HPF 4   |
| 446011 | 1708HPF 4.5 |
| 446012 | 1708HPF 5   |
| 446013 | 1708HPF 5.5 |
| 446014 | 1708HPF 6   |
| 446015 | 1708HPF 6.5 |
| 446016 | 1708HPF 7   |
| 446017 | 1708HPF 7.5 |
| 446018 | 1708HPF 8   |
| 446019 | 1708HPF 8.5 |
| 446020 | 1708HPF 9   |
| 446021 | 1708HPF 9.5 |
| 446022 | 1708HPF 10  |
| 446023 | 1708HPF 11  |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter | 1707HPF   |                               |                               | 1708HPF   |                               |                               |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|-----------|-------------------------------|-------------------------------|-----------|-------------------------------|-------------------------------|
|                                     |                                    |                                      |                                    | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| $d_1$                               | $l_1$                              | $l_2$                                | $d_2$                              |           |                               | €                             |           |                               | €                             |
| 12                                  | 83                                 | 22                                   | 12                                 | 446000    | 1707HPF 12                    |                               | 446024    | 1708HPF 12                    |                               |
| 13                                  | 83                                 | 22                                   | 14                                 | 446001    | 1707HPF 13                    |                               | 446025    | 1708HPF 13                    |                               |
| 14                                  | 83                                 | 22                                   | 14                                 | 446002    | 1707HPF 14                    |                               | 446026    | 1708HPF 14                    |                               |
| 15                                  | 92                                 | 26                                   | 16                                 | 446003    | 1707HPF 15                    |                               | 446027    | 1708HPF 15                    |                               |
| 16                                  | 92                                 | 26                                   | 16                                 | 446004    | 1707HPF 16                    |                               | 446028    | 1708HPF 16                    |                               |
| 20                                  | 104                                | 32                                   | 20                                 | 446005    | 1707HPF 20                    |                               | 446029    | 1708HPF 20                    |                               |

Frese a testa piana in metallo duro integrale micrograna, elica passo variabile, divisione irregolare.  
Square end mills in solid carbide micro grain, variable helix, irregular division.

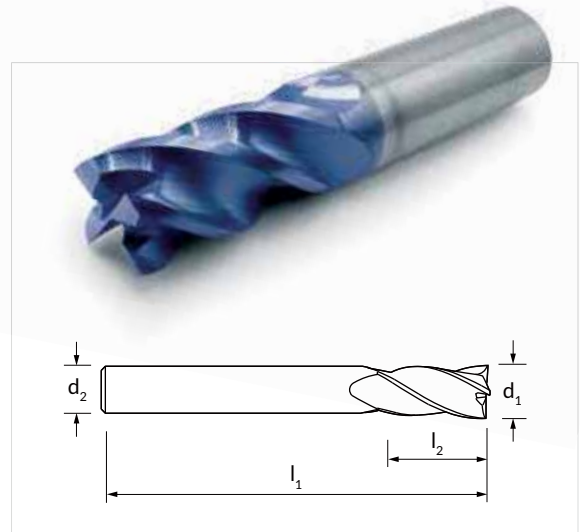
|  |  |   |  |  |
|--|--|---|--|--|
|  |  |   |  |  |
|  |  | - |  |  |

## Operazioni di fresatura | Milling strategies:

|  |  |   |   |   |   |
|--|--|---|---|---|---|
|  |  | - | - | - | - |
|--|--|---|---|---|---|

## Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |                                                          |
|---|---|---|---|---|---|----------------------------------------------------------|
|   |   |   |   |   |   | ● Raccomandato - Most suitable<br>○ Possibile - Possible |



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø          | Raggio   Radius |
|----------------------------------|-----------------|
| d ≤ 6: 0/-0.01   d > 6: 0/-0.015 | -               |

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |

|    |     |    |    |
|----|-----|----|----|
| 3  | 50  | 8  | 6  |
| 4  | 50  | 11 | 6  |
| 5  | 50  | 13 | 6  |
| 6  | 50  | 16 | 6  |
| 8  | 60  | 20 | 8  |
| 10 | 72  | 22 | 10 |
| 12 | 75  | 26 | 12 |
| 14 | 83  | 26 | 14 |
| 16 | 100 | 36 | 16 |
| 20 | 100 | 38 | 20 |

| 1701HPF   |                               |                               |
|-----------|-------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
|           |                               | €                             |

|        |            |
|--------|------------|
| 441532 | 1701HPF 3  |
| 441533 | 1701HPF 4  |
| 441534 | 1701HPF 5  |
| 441535 | 1701HPF 6  |
| 441536 | 1701HPF 8  |
| 441537 | 1701HPF 10 |
| 441538 | 1701HPF 12 |
| 442361 | 1701HPF 14 |
| 441539 | 1701HPF 16 |
| 441540 | 1701HPF 20 |

Frese a testa piana con disimpegno radiale in metallo duro integrale micrograna, elica passo variabile, divisione irregolare.  
Square end mills with reduced neck in solid carbide micro grain, variable helix, irregular division.

|  |  |   |  |  |
|--|--|---|--|--|
|  |  |   |  |  |
|  |  | - |  |  |

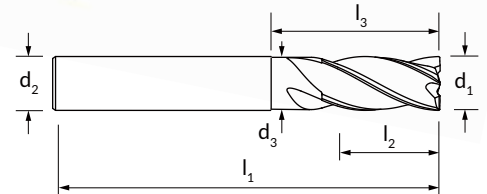
## Operazioni di fresatura | Milling strategies:

|  |  |   |   |   |   |
|--|--|---|---|---|---|
|  |  | - | - | - | - |
|--|--|---|---|---|---|

## Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |                                |
|---|---|---|---|---|---|--------------------------------|
|   |   |   |   |   |   | ● Raccomandato - Most suitable |
|   |   |   |   |   |   | ○ Possibile - Possible         |

NEW



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø          | Raggio   Radius |
|----------------------------------|-----------------|
| d ≤ 6: 0/-0.01   d > 6: 0/-0.015 | -               |

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  |

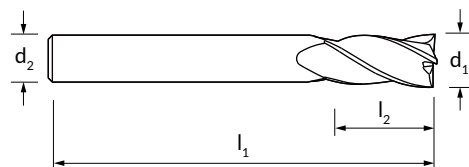
|    |     |    |    |    |     |
|----|-----|----|----|----|-----|
| 3  | 50  | 8  | 14 | 6  | 2,8 |
| 4  | 50  | 11 | 16 | 6  | 3,7 |
| 5  | 50  | 13 | 16 | 6  | 4,6 |
| 6  | 50  | 16 | 20 | 6  | 5,5 |
| 8  | 60  | 20 | 26 | 8  | 7,4 |
| 10 | 72  | 22 | 31 | 10 | 9,2 |
| 12 | 75  | 26 | 37 | 12 | 11  |
| 14 | 83  | 26 | 37 | 14 | 13  |
| 16 | 100 | 36 | 43 | 16 | 15  |
| 20 | 100 | 38 | 53 | 20 | 19  |

| 1709HPF   |                               |                               |
|-----------|-------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
|           |                               | €                             |

|        |            |
|--------|------------|
| 448706 | 1709HPF 3  |
| 448707 | 1709HPF 4  |
| 448708 | 1709HPF 5  |
| 448709 | 1709HPF 6  |
| 448710 | 1709HPF 8  |
| 448711 | 1709HPF 10 |
| 448712 | 1709HPF 12 |
| 448713 | 1709HPF 14 |
| 448714 | 1709HPF 16 |
| 448715 | 1709HPF 20 |

**Frese a testa piana in M.D.I. micrograna, divisione irregolare con rompitrucciolo per lavorazioni di sgrossatura.**  
Square end mills in solid carbide micro grain, irregular division with chipbreaker for roughing machining.

|                                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| <br>TiAlNSi+ |  |  |  |  |
|              |  | -                                                                                 |  |  |



## Operazioni di fresatura | Milling strategies:

|                                                                                   |                                                                                   |   |   |   |   |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---|---|---|---|
|  |  | - | - | - | - |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---|---|---|---|

**Gruppo materiali lavorabili | Group of working materials:**

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | - | - | ● | - |

● Raccomandato - Most suitable  
 ○ Possibile - Possible

## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø      | Raggio   Radius |
|------------------------------|-----------------|
| d≤6: 0/-0.01   d>6: 0/-0.015 | -               |

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter | Numero Ellice<br>Flute Number |  |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|-------------------------------|--|
| $d_1$                               | $l_1$                              | $l_2$                                | $d_2$                              | Z                             |  |

|                  |                                                                                     |                                             |
|------------------|-------------------------------------------------------------------------------------|---------------------------------------------|
| <h1>1702HPF</h1> |                                                                                     |                                             |
| <b>ART. NUM.</b> | <b>Codice d'ordine</b><br><b>Order code</b>                                         | <b>Prezzo utensile</b><br><b>Tool Price</b> |
|                  |  | <b>€</b>                                    |

|           |                                                                                                                        |                                    |
|-----------|------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| 1704HPF   |                                                                                                                        |                                    |
| ART. NUM. | Codice d'ordine<br>Order code<br> | Prezzo utensile<br>Tool Price<br>€ |

|    |     |    |    |   |
|----|-----|----|----|---|
| 3  | 57  | 8  | 6  | 4 |
| 4  | 57  | 11 | 6  | 4 |
| 5  | 57  | 13 | 6  | 4 |
| 6  | 57  | 13 | 6  | 4 |
| 8  | 63  | 21 | 8  | 4 |
| 10 | 72  | 23 | 10 | 4 |
| 12 | 83  | 26 | 12 | 4 |
| 14 | 83  | 26 | 14 | 4 |
| 16 | 92  | 32 | 16 | 4 |
| 18 | 92  | 36 | 18 | 4 |
| 20 | 104 | 38 | 20 | 4 |

|        |         |    |
|--------|---------|----|
| 442563 | 1702HPF | 3  |
| 442561 | 1702HPF | 4  |
| 442562 | 1702HPF | 5  |
| 441541 | 1702HPF | 6  |
| 441542 | 1702HPF | 8  |
| 441543 | 1702HPF | 10 |
| 441544 | 1702HPF | 12 |
| 441545 | 1702HPF | 14 |
| 441546 | 1702HPF | 16 |
| 441547 | 1702HPF | 18 |
| 441548 | 1702HPF | 20 |

|        |         |    |
|--------|---------|----|
| 442740 | 1704HPF | 3  |
| 442741 | 1704HPF | 4  |
| 442742 | 1704HPF | 5  |
| 442743 | 1704HPF | 6  |
| 442744 | 1704HPF | 8  |
| 442745 | 1704HPF | 10 |
| 442746 | 1704HPF | 12 |
| 442747 | 1704HPF | 14 |
| 442748 | 1704HPF | 16 |
| 442749 | 1704HPF | 18 |
| 442750 | 1704HPF | 20 |

**Frese toriche con disimpegno radiale in metallo duro integrale micrograna, elica passo variabile, divisione irregolare.**  
Corner radius end mills with reduced neck in solid carbide micro grain, variable helix, irregular division.

|                                                                                               |                                                                                                 |                                                                                                      |                                                                                           |                                                                                           |
|-----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| <br>TiAINSi+ | <br>z4         | <br>36°-38°-39°-40° | <br>γ12° |          |
| <br>h5       | <br>SHRINK FIT | -                                                                                                    | <br>P33  | <br>P170 |

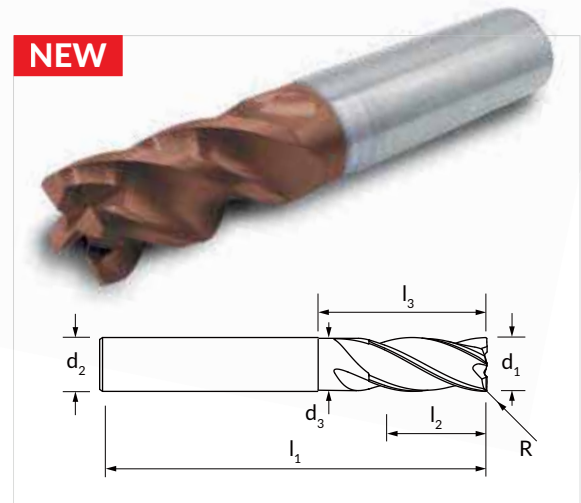
## Operazioni di fresatura | Milling strategies:



## Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |                                                          |
|---|---|---|---|---|---|----------------------------------------------------------|
| ● | - | ● | - | - | - | ● Raccomandato - Most suitable<br>○ Possibile - Possible |

**NEW**



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø | Raggio   Radius |
|-------------------------|-----------------|
| f8                      | -               |

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|
| d <sub>1</sub> (f8)                 | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  |

|    |     |     |    |    |    |      |
|----|-----|-----|----|----|----|------|
| 4  | 0,2 | 57  | 13 | 18 | 6  | 3,8  |
| 5  | 0,2 | 57  | 13 | 18 | 6  | 4,9  |
| 6  | 0,2 | 57  | 13 | 18 | 6  | 5,9  |
| 8  | 0,3 | 63  | 21 | 25 | 8  | 7,9  |
| 10 | 0,5 | 73  | 22 | 30 | 10 | 9,7  |
| 12 | 0,5 | 84  | 26 | 36 | 12 | 11,7 |
| 14 | 0,8 | 84  | 26 | 36 | 14 | 13,7 |
| 16 | 1   | 92  | 36 | 42 | 16 | 15,5 |
| 18 | 1   | 92  | 36 | 42 | 18 | 17,5 |
| 20 | 1   | 103 | 41 | 52 | 20 | 19,5 |

| 1710HPF   |                                                                                       |                               |
|-----------|---------------------------------------------------------------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code                                                         | Prezzo utensile<br>Tool Price |
|           |  | €                             |

|        |            |
|--------|------------|
| 448696 | 1710HPF 4  |
| 448697 | 1710HPF 5  |
| 448698 | 1710HPF 6  |
| 448699 | 1710HPF 8  |
| 448700 | 1710HPF 10 |
| 448701 | 1710HPF 12 |
| 448702 | 1710HPF 14 |
| 448703 | 1710HPF 16 |
| 448704 | 1710HPF 18 |
| 448705 | 1710HPF 20 |

**Frese sferiche in metallo duro integrale micrograna.**  
Ball nose end mills in solid carbide micro grain.

|                                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| <br>Multy Layer |  |  |  | -                                                                                 |
|                 |  | -                                                                                 |  |  |

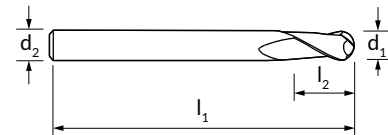
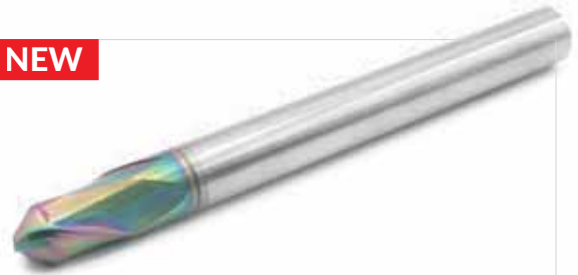
**Operazioni di fresatura | Milling strategies:**

|   |   |   |   |                                                                                   |   |
|---|---|---|---|-----------------------------------------------------------------------------------|---|
| - | - | - | - |  | - |
|---|---|---|---|-----------------------------------------------------------------------------------|---|

**Gruppo materiali lavorabili | Group of working materials:**

|          |          |          |          |          |          |                                                          |
|----------|----------|----------|----------|----------|----------|----------------------------------------------------------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> | ● Raccomandato - Most suitable<br>○ Possibile - Possible |
| ○        | ●        | ○        | -        | ○        | ●        |                                                          |

**NEW**



**Tolleranze | Tolerances:**

| Ø di taglio   Cutting Ø      | Raggio   Radius |
|------------------------------|-----------------|
| d≤6: 0/-0.01   d>6: 0/-0.015 | -               |

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |

|     |     |     |    |
|-----|-----|-----|----|
| 1   | 50  | 1.5 | 4  |
| 1.5 | 50  | 2.3 | 4  |
| 2   | 60  | 3   | 4  |
| 2.5 | 60  | 3.8 | 6  |
| 3   | 50  | 8   | 3  |
| 4   | 60  | 8   | 4  |
| 5   | 70  | 8   | 6  |
| 6   | 80  | 10  | 6  |
| 8   | 90  | 12  | 8  |
| 10  | 100 | 15  | 10 |
| 10  | 150 | 18  | 10 |
| 12  | 110 | 20  | 12 |

| 442RHPF   |                               |                               |
|-----------|-------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
|           |                               | €                             |

|        |         |              |
|--------|---------|--------------|
| 448677 | 442RHPF | 1X1.5X50X4   |
| 448679 | 442RHPF | 1.5X2.3X50X4 |
| 448678 | 442RHPF | 2X3X60X4     |
| 448680 | 442RHPF | 2.5X3.8X60X6 |
| 448681 | 442RHPF | 3X8X50X3     |
| 448682 | 442RHPF | 4X8X60X4     |
| 448683 | 442RHPF | 5X8X70X6     |
| 448684 | 442RHPF | 6X10X80X6    |
| 448685 | 442RHPF | 8X12X90X8    |
| 448686 | 442RHPF | 10X15X100X10 |
| 448687 | 442RHPF | 10X18X150X10 |
| 448688 | 442RHPF | 12X20X110X12 |

Frese sferiche in metallo duro integrale micrograna, divisione irregolare.  
Ball nose end mills in solid carbide micro grain, irregular division.

|                                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| <br>Multy Layer |  |  |  |  |
|                 |  | -                                                                                 |  |  |

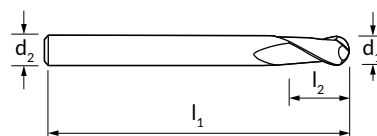
## Operazioni di fresatura | Milling strategies:

|   |   |   |   |                                                                                   |   |
|---|---|---|---|-----------------------------------------------------------------------------------|---|
| - | - | - | - |  | - |
|---|---|---|---|-----------------------------------------------------------------------------------|---|

## Gruppo materiali lavorabili | Group of working materials:

|   |   |   |   |   |   |                                |
|---|---|---|---|---|---|--------------------------------|
| P | M | K | N | S | H | ● Raccomandato - Most suitable |
| ○ | ○ | ○ | - | ○ | ○ | ○ Possibile - Possible         |

NEW



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø      | Raggio   Radius |
|------------------------------|-----------------|
| d≤6: 0/-0.01   d>6: 0/-0.015 | -               |

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |

|    |     |    |    |
|----|-----|----|----|
| 2  | 50  | 4  | 6  |
| 3  | 70  | 4  | 6  |
| 4  | 70  | 6  | 6  |
| 6  | 90  | 9  | 6  |
| 8  | 100 | 12 | 8  |
| 10 | 100 | 15 | 10 |
| 12 | 110 | 18 | 12 |

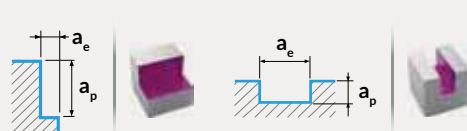
| 444RHPF   |                               |                               |
|-----------|-------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
|           |                               | €                             |

|        |                      |  |
|--------|----------------------|--|
| 448689 | 444RHPF 2X4X50X6     |  |
| 448690 | 444RHPF 3X4X70X6     |  |
| 448691 | 444RHPF 4X6X70X6     |  |
| 448692 | 444RHPF 6X9X90X6     |  |
| 448693 | 444RHPF 8X12X100X8   |  |
| 448694 | 444RHPF 10X15X100X10 |  |
| 448695 | 444RHPF 12X18X110X12 |  |

## 1700HPF - 1703HPF

Z4

Frese a testa piana in metallo duro integrale micrograna, divisione irregolare per fresature trocoidali.  
Square end mills in solid carbide micro grain, irregular division for trochoidal milling.



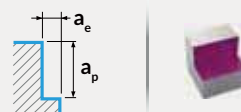
| d <sub>1</sub> | Acciai ≤1100 N/mm <sup>2</sup><br>Steels ≤1100 N/mm <sup>2</sup> |                            |                        |                        | Acciai Inossidabili<br>Stainless Steel |                            |                        |                        | Acciai ≤1100 N/mm <sup>2</sup><br>Steels ≤1100 N/mm <sup>2</sup> |                            |                        |                        | Acciai Inossidabili<br>Stainless Steel |                            |                        |                        |
|----------------|------------------------------------------------------------------|----------------------------|------------------------|------------------------|----------------------------------------|----------------------------|------------------------|------------------------|------------------------------------------------------------------|----------------------------|------------------------|------------------------|----------------------------------------|----------------------------|------------------------|------------------------|
|                | n<br>(min <sup>-1</sup> )                                        | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> )              | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> )                                        | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> )              | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |
|                | Contornatura Side Milling                                        |                            |                        |                        |                                        |                            |                        |                        | Cave Slotting Milling                                            |                            |                        |                        |                                        |                            |                        |                        |
| 3              | 14.331                                                           | 1.146                      | 3,6                    | 1,05                   | 9.023                                  | 433                        | 3,6                    | 1,05                   | 10.616                                                           | 425                        | 2,3                    | 3                      | 6.900                                  | 166                        | 2,3                    | 3                      |
| 4              | 10.748                                                           | 1.290                      | 4,8                    | 1,40                   | 6.768                                  | 541                        | 4,8                    | 1,40                   | 7.962                                                            | 414                        | 4,0                    | 4                      | 5.175                                  | 207                        | 4,0                    | 4                      |
| 5              | 8.599                                                            | 1.204                      | 6,0                    | 1,75                   | 5.414                                  | 541                        | 6,0                    | 1,75                   | 6.369                                                            | 382                        | 5,0                    | 5                      | 4.140                                  | 215                        | 5,0                    | 5                      |
| 6              | 7.166                                                            | 1.146                      | 7,2                    | 2,10                   | 4.512                                  | 469                        | 7,2                    | 2,10                   | 5.308                                                            | 425                        | 6,0                    | 6                      | 3.450                                  | 221                        | 6,0                    | 6                      |
| 8              | 5.374                                                            | 1.075                      | 9,6                    | 2,80                   | 3.384                                  | 406                        | 9,6                    | 2,80                   | 3.981                                                            | 478                        | 8,0                    | 8                      | 2.588                                  | 207                        | 8,0                    | 8                      |
| 10             | 4.299                                                            | 1.118                      | 12,0                   | 3,50                   | 2.707                                  | 433                        | 12,0                   | 3,50                   | 3.185                                                            | 510                        | 10,0                   | 10                     | 2.070                                  | 207                        | 10,0                   | 10                     |
| 12             | 3.583                                                            | 1.075                      | 14,4                   | 4,20                   | 2.256                                  | 451                        | 14,4                   | 4,20                   | 2.654                                                            | 478                        | 12,0                   | 12                     | 1.725                                  | 207                        | 12,0                   | 12                     |
| 16             | 2.687                                                            | 914                        | 19,2                   | 5,60                   | 1.692                                  | 372                        | 19,2                   | 5,60                   | 1.990                                                            | 398                        | 16,0                   | 16                     | 1.294                                  | 181                        | 16,0                   | 16                     |
| 20             | 2.150                                                            | 860                        | 24,0                   | 7,00                   | 1.354                                  | 352                        | 24,0                   | 7,00                   | 1.592                                                            | 382                        | 20,0                   | 20                     | 1.035                                  | 166                        | 20,0                   | 20                     |

• Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

## 1705HPF - 1706HPF

Z4

Frese a testa piana con disimpegno radiale in M.D.I. micrograna, divisione irregolare per fresature trocoidali.  
Square end mills with reduced neck in solid carbide micro grain, irregular division for trochoidal milling.



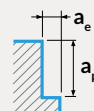
| d <sub>1</sub> | Acciai ≤1100 N/mm <sup>2</sup><br>Steels ≤1100 N/mm <sup>2</sup> |                            |                        |                        | Acciai Inossidabili<br>Stainless Steel |                            |                        |                        | HRSA e Titanio<br>HRSA & Titanium |                            |                        |                        |
|----------------|------------------------------------------------------------------|----------------------------|------------------------|------------------------|----------------------------------------|----------------------------|------------------------|------------------------|-----------------------------------|----------------------------|------------------------|------------------------|
|                | n<br>(min <sup>-1</sup> )                                        | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> )              | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> )         | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |
| 3              | 12.739                                                           | 510                        | 3,9                    | 1,05                   | 8.493                                  | 272                        | 3,9                    | 1,05                   | 4.246                             | 136                        | 3,9                    | 1,05                   |
| 4              | 9.554                                                            | 573                        | 5,2                    | 1,40                   | 6.369                                  | 280                        | 5,2                    | 1,40                   | 3.185                             | 140                        | 5,2                    | 1,40                   |
| 5              | 7.643                                                            | 611                        | 6,5                    | 1,75                   | 5.096                                  | 265                        | 6,5                    | 1,75                   | 2.548                             | 132                        | 6,5                    | 1,75                   |
| 6              | 6.369                                                            | 637                        | 7,8                    | 2,10                   | 4.246                                  | 289                        | 7,8                    | 2,10                   | 2.123                             | 144                        | 7,8                    | 2,10                   |
| 8              | 4.777                                                            | 573                        | 10,4                   | 2,80                   | 3.185                                  | 318                        | 10,4                   | 2,80                   | 1.592                             | 159                        | 10,4                   | 2,80                   |
| 10             | 3.822                                                            | 688                        | 13,0                   | 3,50                   | 2.548                                  | 357                        | 13,0                   | 3,50                   | 1.274                             | 178                        | 13,0                   | 3,50                   |
| 12             | 3.185                                                            | 637                        | 15,6                   | 4,20                   | 2.123                                  | 340                        | 15,6                   | 4,20                   | 1.062                             | 170                        | 15,6                   | 4,20                   |
| 16             | 2.389                                                            | 573                        | 20,8                   | 5,60                   | 1.592                                  | 318                        | 20,8                   | 5,60                   | 796                               | 159                        | 20,8                   | 5,60                   |
| 20             | 1.911                                                            | 535                        | 26,0                   | 7,00                   | 1.274                                  | 306                        | 26,0                   | 7,00                   | 637                               | 153                        | 26,0                   | 7,00                   |

• Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

## 1707HPF - 1708HPF

Z3

Frese a testa piana in metallo duro integrale micrograna, elica passo variabile, divisione irregolare.  
Square end mills in solid carbide micro grain, variable helix, irregular division.



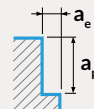
| d <sub>1</sub> | Acciai ≤1100 N/mm <sup>2</sup><br>Steels ≤1100 N/mm <sup>2</sup> |                            |                        |                        | Acciai Inossidabili<br>Stainless Steel |                            |                        |                        | Ghisa<br>Cast Iron        |                            |                        |                        |
|----------------|------------------------------------------------------------------|----------------------------|------------------------|------------------------|----------------------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|
|                | n<br>(min <sup>-1</sup> )                                        | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> )              | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |
| 2              | 15.924                                                           | 239                        | 2,6                    | 1,0                    | 12.739                                 | 191                        | 2,6                    | 1,0                    | 19.904                    | 299                        | 2,6                    | 1,0                    |
| 3              | 10.616                                                           | 255                        | 3,9                    | 1,5                    | 8.493                                  | 204                        | 3,9                    | 1,5                    | 13.270                    | 318                        | 3,9                    | 1,5                    |
| 4              | 7.962                                                            | 287                        | 5,2                    | 2,0                    | 6.369                                  | 153                        | 5,2                    | 2,0                    | 9.952                     | 358                        | 5,2                    | 2,0                    |
| 5              | 6.369                                                            | 287                        | 6,5                    | 2,5                    | 5.096                                  | 153                        | 6,5                    | 2,5                    | 7.962                     | 358                        | 6,5                    | 2,5                    |
| 6              | 5.308                                                            | 287                        | 7,8                    | 3,0                    | 4.246                                  | 127                        | 7,8                    | 3,0                    | 6.635                     | 358                        | 7,8                    | 3,0                    |
| 7              | 4.550                                                            | 300                        | 9,1                    | 3,5                    | 3.640                                  | 164                        | 9,1                    | 3,5                    | 5.687                     | 375                        | 9,1                    | 3,5                    |
| 8              | 3.981                                                            | 299                        | 10,4                   | 4,0                    | 3.185                                  | 143                        | 10,4                   | 4,0                    | 4.976                     | 373                        | 10,4                   | 4,0                    |
| 9              | 3.539                                                            | 297                        | 11,7                   | 4,5                    | 2.831                                  | 170                        | 11,7                   | 4,5                    | 4.423                     | 372                        | 11,7                   | 4,5                    |
| 10             | 3.185                                                            | 334                        | 13,0                   | 5,0                    | 2.548                                  | 153                        | 13,0                   | 5,0                    | 3.981                     | 418                        | 13,0                   | 5,0                    |
| 11             | 2.895                                                            | 330                        | 14,3                   | 5,5                    | 2.316                                  | 174                        | 14,3                   | 5,5                    | 3.619                     | 413                        | 14,3                   | 5,5                    |
| 12             | 2.654                                                            | 318                        | 15,6                   | 6,0                    | 2.123                                  | 159                        | 15,6                   | 6,0                    | 3.317                     | 398                        | 15,6                   | 6,0                    |
| 13             | 2.450                                                            | 294                        | 16,9                   | 6,5                    | 1.960                                  | 176                        | 16,9                   | 6,5                    | 3.062                     | 367                        | 16,9                   | 6,5                    |
| 14             | 2.275                                                            | 307                        | 18,2                   | 7,0                    | 1.820                                  | 164                        | 18,2                   | 7,0                    | 2.843                     | 384                        | 18,2                   | 7,0                    |
| 15             | 2.123                                                            | 318                        | 19,5                   | 7,5                    | 1.699                                  | 178                        | 19,5                   | 7,5                    | 2.654                     | 398                        | 19,5                   | 7,5                    |
| 16             | 1.990                                                            | 311                        | 20,8                   | 8,0                    | 1.592                                  | 167                        | 20,8                   | 8,0                    | 2.488                     | 388                        | 20,8                   | 8,0                    |
| 20             | 1.592                                                            | 287                        | 26,0                   | 10,0                   | 1.274                                  | 172                        | 26,0                   | 10,0                   | 1.990                     | 358                        | 26,0                   | 10,0                   |

• Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

## 1701HPF- 1709HPF

Z4

Frese a testa piana / con disimpegno radiale in metallo duro integrale micrograna, elica passo variabile, divisione irregolare.  
Square / with reduced neck end mills in solid carbide micro grain, variable helix, irregular division.



| d <sub>1</sub> | Acciai ≤1100 N/mm <sup>2</sup><br>Steels ≤1100 N/mm <sup>2</sup> |                            |                        |                        | Acciai Inossidabili<br>Stainless Steel |                            |                        |                        | HRSA e Titanio<br>HRSA & Titanium |                            |                        |                        |
|----------------|------------------------------------------------------------------|----------------------------|------------------------|------------------------|----------------------------------------|----------------------------|------------------------|------------------------|-----------------------------------|----------------------------|------------------------|------------------------|
|                | n<br>(min <sup>-1</sup> )                                        | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> )              | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> )         | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |
| 4              | 8.758                                                            | 420                        | 6,0                    | 0,80                   | 6.369                                  | 306                        | 6,0                    | 0,80                   | 3.185                             | 153                        | 6,0                    | 0,80                   |
| 6              | 5.839                                                            | 420                        | 9,0                    | 1,20                   | 4.246                                  | 306                        | 9,0                    | 1,20                   | 2.123                             | 153                        | 9,0                    | 1,20                   |
| 8              | 4.379                                                            | 403                        | 12,0                   | 1,60                   | 3.185                                  | 293                        | 12,0                   | 1,60                   | 1.592                             | 146                        | 12,0                   | 1,60                   |
| 10             | 3.503                                                            | 392                        | 15,0                   | 2,00                   | 2.548                                  | 285                        | 15,0                   | 2,00                   | 1.274                             | 143                        | 15,0                   | 2,00                   |
| 12             | 2.919                                                            | 409                        | 18,0                   | 2,40                   | 2.123                                  | 297                        | 18,0                   | 2,40                   | 1.062                             | 149                        | 18,0                   | 2,40                   |
| 14             | 2.502                                                            | 400                        | 21,0                   | 2,80                   | 1.820                                  | 291                        | 21,0                   | 2,80                   | 910                               | 146                        | 21,0                   | 2,80                   |
| 16             | 2.189                                                            | 394                        | 24,0                   | 3,20                   | 1.592                                  | 287                        | 24,0                   | 3,20                   | 796                               | 143                        | 24,0                   | 3,20                   |
| 18             | 1.946                                                            | 405                        | 27,0                   | 3,60                   | 1.415                                  | 294                        | 27,0                   | 3,60                   | 708                               | 147                        | 27,0                   | 3,60                   |
| 20             | 1.752                                                            | 420                        | 30,0                   | 4,00                   | 1.274                                  | 306                        | 30,0                   | 4,00                   | 637                               | 153                        | 30,0                   | 4,00                   |

• Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

## 1702HPF - 1704HPF

## Z (3-4-6)

Frese a testa piana in M.D.I. micrograna, divisione irregolare con rompitrucciolo per lavorazioni di sgrossatura.

Square end mills in solid carbide micro grain, irregular division with chipbreaker for roughing machining.



|                           | Acciai $\leq 1100$ N/mm <sup>2</sup><br>Steels $\leq 1100$ N/mm <sup>2</sup> |                   |               |               | Acciai Inossidabili<br>Stainless Steel |                   |               |               | HRSA e Titanio<br>HRSA & Titanium |                   |               |               |
|---------------------------|------------------------------------------------------------------------------|-------------------|---------------|---------------|----------------------------------------|-------------------|---------------|---------------|-----------------------------------|-------------------|---------------|---------------|
| $d_1$                     | n<br>(min <sup>-1</sup> )                                                    | $V_f$<br>(mm/min) | $a_p$<br>(mm) | $a_e$<br>(mm) | n<br>(min <sup>-1</sup> )              | $V_f$<br>(mm/min) | $a_p$<br>(mm) | $a_e$<br>(mm) | n<br>(min <sup>-1</sup> )         | $V_f$<br>(mm/min) | $a_p$<br>(mm) | $a_e$<br>(mm) |
| Contornatura Side Milling |                                                                              |                   |               |               |                                        |                   |               |               |                                   |                   |               |               |

|    |        |     |      |      |       |     |      |      |       |     |      |      |
|----|--------|-----|------|------|-------|-----|------|------|-------|-----|------|------|
| 3  | 13.270 | 597 | 3,3  | 1,5  | 5.308 | 159 | 3,3  | 1,5  | 4.246 | 127 | 3,3  | 1,5  |
| 4  | 9.952  | 597 | 4,4  | 2,0  | 9.952 | 448 | 4,4  | 2,0  | 9.952 | 448 | 4,4  | 2,0  |
| 5  | 7.962  | 796 | 5,5  | 2,5  | 7.962 | 637 | 5,5  | 2,5  | 7.962 | 637 | 5,5  | 2,5  |
| 6  | 6.635  | 796 | 6,6  | 3,0  | 6.635 | 663 | 6,6  | 3,0  | 6.635 | 663 | 6,6  | 3,0  |
| 8  | 4.976  | 796 | 8,8  | 4,0  | 4.976 | 597 | 8,8  | 4,0  | 4.976 | 597 | 8,8  | 4,0  |
| 10 | 3.981  | 796 | 11,0 | 5,0  | 3.981 | 557 | 11,0 | 5,0  | 3.981 | 557 | 11,0 | 5,0  |
| 12 | 3.317  | 663 | 13,2 | 6,0  | 3.317 | 531 | 13,2 | 6,0  | 3.317 | 531 | 13,2 | 6,0  |
| 16 | 2.488  | 821 | 17,6 | 8,0  | 2.488 | 597 | 17,6 | 8,0  | 2.488 | 597 | 17,6 | 8,0  |
| 20 | 1.990  | 717 | 22,0 | 10,0 | 1.990 | 537 | 22,0 | 10,0 | 1.990 | 537 | 22,0 | 10,0 |

• Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

|  | Cave Slotting Milling |  |  |  |  |  |  |  |  |  |  |  |
|--|-----------------------|--|--|--|--|--|--|--|--|--|--|--|
|--|-----------------------|--|--|--|--|--|--|--|--|--|--|--|

|    |       |     |    |    |       |     |    |    |       |     |    |    |
|----|-------|-----|----|----|-------|-----|----|----|-------|-----|----|----|
| 3  | 7.962 | 358 | 3  | 3  | 4.246 | 127 | 3  | 3  | 3.185 | 96  | 3  | 3  |
| 4  | 5.971 | 358 | 4  | 4  | 3.185 | 143 | 4  | 4  | 2.389 | 107 | 4  | 4  |
| 5  | 4.777 | 478 | 5  | 5  | 2.548 | 204 | 5  | 5  | 1.911 | 153 | 5  | 5  |
| 6  | 3.981 | 478 | 6  | 6  | 2.123 | 212 | 6  | 6  | 1.592 | 159 | 6  | 6  |
| 8  | 2.986 | 478 | 8  | 8  | 1.592 | 191 | 8  | 8  | 1.194 | 143 | 8  | 8  |
| 10 | 2.389 | 478 | 10 | 10 | 1.274 | 178 | 10 | 10 | 955   | 134 | 10 | 10 |
| 12 | 1.990 | 398 | 12 | 12 | 1.062 | 170 | 12 | 12 | 796   | 127 | 12 | 12 |
| 16 | 1.493 | 493 | 16 | 16 | 796   | 191 | 16 | 16 | 597   | 143 | 16 | 16 |
| 20 | 1.194 | 430 | 20 | 20 | 637   | 172 | 20 | 20 | 478   | 129 | 20 | 20 |

• Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

## 1710HPF

Z4

Frese toriche con disimpegno radiale in metallo duro integrale micrograna, elica passo variabile, divisione irregolare.  
Corner radius end mills with reduced neck in solid carbide micro grain, variable helix, irregular division.



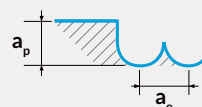
|                | Acciai ≤800 N/mm <sup>2</sup><br>Steels ≤800 N/mm <sup>2</sup> |                            |                        |                        | Acciai ≤1100 N/mm <sup>2</sup><br>Steels ≤1100 N/mm <sup>2</sup> |                            |                        |                        | Ghisa<br>Cast Iron        |                            |                        |                        |
|----------------|----------------------------------------------------------------|----------------------------|------------------------|------------------------|------------------------------------------------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|
| d <sub>i</sub> | n<br>(min <sup>-1</sup> )                                      | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> )                                        | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |
| 4              | 15.924                                                         | 1.274                      | 4                      | 4                      | 6.369                                                            | 382                        | 4                      | 4                      | 14.331                    | 1.146                      | 4                      | 4                      |
| 5              | 12.739                                                         | 1.529                      | 5                      | 5                      | 5.096                                                            | 408                        | 5                      | 5                      | 11.465                    | 1.146                      | 5                      | 5                      |
| 6              | 10.616                                                         | 1.274                      | 6                      | 6                      | 4.246                                                            | 425                        | 6                      | 6                      | 9.554                     | 1.146                      | 6                      | 6                      |
| 8              | 7.962                                                          | 1.274                      | 8                      | 8                      | 3.185                                                            | 382                        | 8                      | 8                      | 7.166                     | 1.433                      | 8                      | 8                      |
| 10             | 6.369                                                          | 1.656                      | 10                     | 10                     | 2.548                                                            | 510                        | 10                     | 10                     | 5.732                     | 1.605                      | 10                     | 10                     |
| 12             | 5.308                                                          | 1.486                      | 12                     | 12                     | 2.123                                                            | 510                        | 12                     | 12                     | 4.777                     | 1.529                      | 12                     | 12                     |
| 14             | 4.550                                                          | 1.456                      | 14                     | 14                     | 1.820                                                            | 400                        | 14                     | 14                     | 4.095                     | 819                        | 14                     | 14                     |
| 16             | 3.981                                                          | 1.433                      | 16                     | 16                     | 1.592                                                            | 414                        | 16                     | 16                     | 3.583                     | 1.290                      | 16                     | 16                     |
| 18             | 3.539                                                          | 1.415                      | 18                     | 18                     | 1.415                                                            | 396                        | 18                     | 18                     | 3.185                     | 1.210                      | 18                     | 18                     |
| 20             | 3.185                                                          | 1.401                      | 20                     | 20                     | 1.274                                                            | 433                        | 20                     | 20                     | 2.866                     | 1.146                      | 20                     | 20                     |

• Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

## 442RHPF - 444RHPF

Z (2-4)

Frese sferiche in Metallo Duro Integrale micrograna.  
Ball nose end mills in solid carbide micro grain.



|                     | Acciai Temprati<br>Hardened Steels |                            |                        |                        |                           |                            |                        |                        |  |
|---------------------|------------------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|--|
| Durezza<br>Hardness | ≤ 45 HRC                           |                            |                        |                        | ≤ 55 HRC                  |                            |                        |                        |  |
| R                   | n<br>(min <sup>-1</sup> )          | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |  |
| 0,50                | 38.500                             | 1.560                      | 0,10                   | 0,300                  | 36.900                    | 1.250                      | 0,080                  | 0,240                  |  |
| 0,75                | 25.380                             | 1.600                      | 0,15                   | 0,450                  | 28.700                    | 1.280                      | 0,120                  | 0,360                  |  |
| 1,00                | 30.370                             | 1.850                      | 0,20                   | 0,600                  | 24.600                    | 1.480                      | 0,160                  | 0,480                  |  |
| 1,25                | 28.700                             | 1.600                      | 0,25                   | 0,640                  | 27.900                    | 1.280                      | 0,200                  | 0,430                  |  |
| 2,00                | 17.670                             | 2.450                      | 0,40                   | 1,380                  | 17.140                    | 1.960                      | 0,320                  | 1,100                  |  |
| 2,50                | 16.500                             | 2.570                      | 0,50                   | 1,800                  | 16.000                    | 2.060                      | 0,400                  | 1,500                  |  |
| 3,00                | 15.500                             | 2.700                      | 0,60                   | 2,300                  | 15.000                    | 2.160                      | 0,480                  | 1,870                  |  |
| 4,00                | 10.900                             | 2.300                      | 0,80                   | 3,100                  | 10.600                    | 1.840                      | 0,640                  | 2,480                  |  |
| 5,00                | 8.900                              | 2.200                      | 1,00                   | 3,750                  | 8.700                     | 1.780                      | 0,800                  | 3,000                  |  |
| 6,00                | 6.670                              | 1.850                      | 1,20                   | 4,400                  | 6.480                     | 1480                       | 0,960                  | 3,500                  |  |

• Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters



**Evolution**  
FRESE • END MILLS

**Talcarb**



**FRESE PER ACCIAI INOSSIDABILI E LEGHE DI TITANIO**  
End Mills for Stainless Steels and Titanium Alloys

Frese a testa piana in metallo duro integrale micrograna, elica passo variabile.  
Square end mills in solid carbide micro grain, variable helix.

|  |  |   |  |   |
|--|--|---|--|---|
|  |  |   |  | - |
|  |  | - |  |   |

## Operazioni di fresatura | Milling strategies:

|  |  |   |   |   |   |
|--|--|---|---|---|---|
|  |  | - | - | - | - |
|--|--|---|---|---|---|

## Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |                                                          |
|---|---|---|---|---|---|----------------------------------------------------------|
| - | ● | - | - | ● | - | ● Raccomandato - Most suitable<br>○ Possibile - Possible |



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø          | Raggio   Radius |
|----------------------------------|-----------------|
| d ≤ 6: 0/-0.01   d > 6: 0/-0.015 | -               |

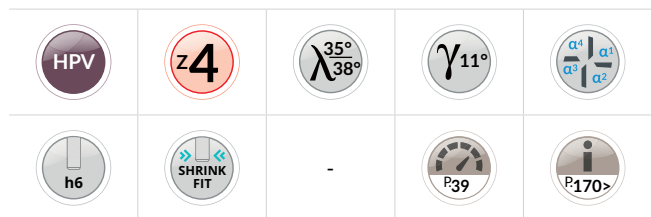
| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |

|     |    |     |    |
|-----|----|-----|----|
| 1   | 50 | 2.5 | 4  |
| 1.5 | 50 | 4   | 4  |
| 2   | 50 | 6   | 4  |
| 2.5 | 50 | 7   | 4  |
| 3   | 60 | 10  | 6  |
| 4   | 60 | 12  | 6  |
| 5   | 60 | 15  | 6  |
| 6   | 50 | 15  | 6  |
| 6   | 70 | 20  | 6  |
| 8   | 60 | 19  | 8  |
| 10  | 70 | 22  | 10 |
| 12  | 75 | 26  | 12 |

| 1319HPV   |                               |                               |
|-----------|-------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
|           |                               | €                             |

|        |                     |
|--------|---------------------|
| 440871 | 1319HPV 1X2.5X50X4  |
| 440872 | 1319HPV 1.5X4X50X4  |
| 440873 | 1319HPV 2X6X50X4    |
| 440874 | 1319HPV 2.5X7X50X4  |
| 440875 | 1319HPV 3X10X60X6   |
| 440876 | 1319HPV 4X12X60X6   |
| 440877 | 1319HPV 5X15X60X6   |
| 440878 | 1319HPV 6X15X50X6   |
| 440879 | 1319HPV 6X20X70X6   |
| 440880 | 1319HPV 8X19X60X8   |
| 440881 | 1319HPV 10X22X70X10 |
| 440882 | 1319HPV 12X26X75X12 |

**Frese toriche in metallo duro integrale microgran, elica passo variabile, divisione irregolare.**  
**Corner radius end mills in solid carbide micro grain, variable helix, irregular division.**

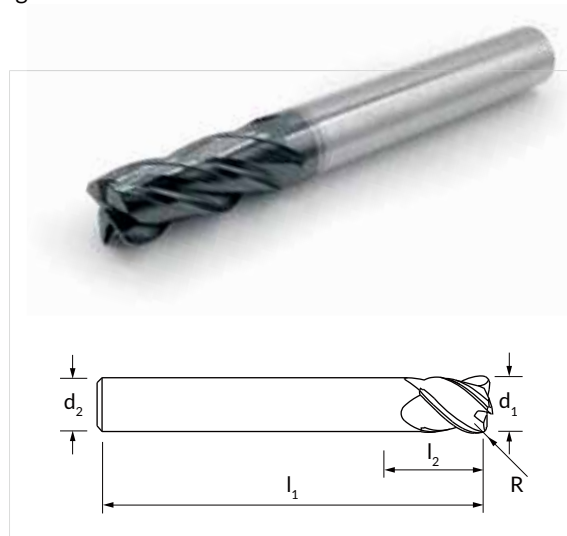


## Operazioni di fresatura | Milling strategies:



## Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |                                                          |
|---|---|---|---|---|---|----------------------------------------------------------|
| - | ● | - | - | ● | - | ● Raccomandato - Most suitable<br>○ Possibile - Possible |



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø      | Raggio   Radius |
|------------------------------|-----------------|
| d≤6: 0/-0.01   d>6: 0/-0.015 | ±0.01           |

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |
| 1                                   | 0.1                             | 50                                 | 2.5                                  | 4                                  |
| 1                                   | 0.2                             | 50                                 | 2.5                                  | 4                                  |
| 1.5                                 | 0.1                             | 50                                 | 4.0                                  | 4                                  |
| 1.5                                 | 0.2                             | 50                                 | 4.0                                  | 4                                  |
| 2                                   | 0.1                             | 50                                 | 6.0                                  | 4                                  |
| 2                                   | 0.2                             | 50                                 | 6.0                                  | 4                                  |
| 2.5                                 | 0.2                             | 50                                 | 7.0                                  | 4                                  |
| 3                                   | 0.2                             | 60                                 | 10                                   | 6                                  |
| 3                                   | 0.5                             | 60                                 | 10                                   | 6                                  |
| 4                                   | 0.2                             | 60                                 | 12                                   | 6                                  |
| 4                                   | 0.5                             | 60                                 | 12                                   | 6                                  |
| 5                                   | 0.2                             | 60                                 | 15                                   | 6                                  |
| 5                                   | 0.5                             | 60                                 | 15                                   | 6                                  |
| 6                                   | 0.3                             | 60                                 | 15                                   | 6                                  |
| 6                                   | 0.5                             | 60                                 | 15                                   | 6                                  |
| 6                                   | 1                               | 60                                 | 15                                   | 6                                  |
| 8                                   | 0.3                             | 80                                 | 20                                   | 8                                  |
| 8                                   | 0.5                             | 80                                 | 20                                   | 8                                  |

| 319RHPV   |                               |            |                               |
|-----------|-------------------------------|------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code | HA<br>6535 | Prezzo utensile<br>Tool Price |
|           |                               |            | €                             |
| 440883    | 319RHPV 1X.1X2.5X50X4         |            |                               |
| 440884    | 319RHPV 1X.2X2.5X50X4         |            |                               |
| 440885    | 319RHPV 1.5X.1X4X50X4         |            |                               |
| 440886    | 319RHPV 1.5X.2X4X50X4         |            |                               |
| 440887    | 319RHPV 2X.1X6X50X4           |            |                               |
| 440888    | 319RHPV 2X.2X6X50X4           |            |                               |
| 440889    | 319RHPV 2.5X.2X7X50X4         |            |                               |
| 440890    | 319RHPV 3X.2X10X60X6          |            |                               |
| 440891    | 319RHPV 3X.5X10X60X6          |            |                               |
| 440892    | 319RHPV 4X.2X12X60X6          |            |                               |
| 440893    | 319RHPV 4X.5X12X60X6          |            |                               |
| 440894    | 319RHPV 5X.2X15X60X6          |            |                               |
| 440895    | 319RHPV 5X.5X15X60X6          |            |                               |
| 440896    | 319RHPV 6X.3X15X60X6          |            |                               |
| 440897    | 319RHPV 6X.5X15X60X6          |            |                               |
| 440898    | 319RHPV 6X1X15X60X6           |            |                               |
| 440899    | 319RHPV 8X.3X20X80X8          |            |                               |
| 440900    | 319RHPV 8X.5X20X80X8          |            |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

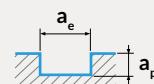
**Frese toriche in metallo duro integrale microgran, elica passo variabile, divisione irregolare.**  
 Corner radius end mills in solid carbide micro grain, variable helix, irregular division.

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter | 319RHPV   |                               |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|-----------|-------------------------------|-------------------------------|
|                                     |                                 |                                    |                                      |                                    | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |           |                               | €                             |
| 8                                   | 1                               | 80                                 | 20                                   | 8                                  | 440901    | 319RHPV 8X1X20X80X8           |                               |
| 10                                  | 0.3                             | 80                                 | 25                                   | 10                                 | 440902    | 319RHPV 10X.3X25X80X10        |                               |
| 10                                  | 0.5                             | 80                                 | 25                                   | 10                                 | 440903    | 319RHPV 10X.5X25X80X10        |                               |
| 10                                  | 1                               | 80                                 | 25                                   | 10                                 | 440904    | 319RHPV 10X1X25X80X10         |                               |
| 10                                  | 1.5                             | 80                                 | 25                                   | 10                                 | 440905    | 319RHPV 10X1.5X25X80X10       |                               |
| 10                                  | 2                               | 80                                 | 25                                   | 10                                 | 440906    | 319RHPV 10X2X25X80X10         |                               |
| 12                                  | 0.5                             | 80                                 | 30                                   | 12                                 | 440907    | 319RHPV 12X.5X30X80X12        |                               |
| 12                                  | 1                               | 80                                 | 30                                   | 12                                 | 440908    | 319RHPV 12X1X30X80X12         |                               |
| 12                                  | 1.5                             | 80                                 | 30                                   | 12                                 | 440909    | 319RHPV 12X1.5X30X80X12       |                               |
| 12                                  | 2                               | 80                                 | 30                                   | 12                                 | 440910    | 319RHPV 12X2X30X80X12         |                               |

## 1319HPV

Z4

Frese a testa piana in metallo duro integrale micrograna ad elica variabile.  
Square end mills in solid carbide micro grain with variable helix.



|                     | Acciai Legati - Ghisa<br>Alloy Steels - Cast Iron |                            |                        |                        | Acciai Inos. Serie 300 - Titanio<br>Stainless Steels 300 Series - Titanium |                            |                        |                        | Acciai Inossidabili Serie 400<br>Stainless Steels 400 Series |                            |                        |                        |
|---------------------|---------------------------------------------------|----------------------------|------------------------|------------------------|----------------------------------------------------------------------------|----------------------------|------------------------|------------------------|--------------------------------------------------------------|----------------------------|------------------------|------------------------|
| Durezza<br>Hardness | -HB230                                            |                            |                        |                        |                                                                            |                            |                        |                        |                                                              |                            |                        |                        |
| d <sub>1</sub>      | n<br>(min <sup>-1</sup> )                         | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> )                                                  | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> )                                    | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |
| 1                   | 40.500                                            | 300                        | 1                      | 1                      | 20.000                                                                     | 250                        | 1                      | 1                      | 28.000                                                       | 160                        | 1                      | 1                      |
| 1,5                 | 27.000                                            | 300                        | 1,5                    | 1,5                    | 13.000                                                                     | 180                        | 1,5                    | 1,5                    | 18.500                                                       | 160                        | 1,5                    | 1,5                    |
| 2                   | 20.300                                            | 300                        | 2                      | 2                      | 10.000                                                                     | 150                        | 2                      | 2                      | 14.000                                                       | 160                        | 2                      | 2                      |
| 2,5                 | 16.200                                            | 300                        | 2,5                    | 2,5                    | 8.000                                                                      | 120                        | 2,5                    | 2,5                    | 11.000                                                       | 165                        | 2,5                    | 2,5                    |
| 3                   | 13.500                                            | 275                        | 3                      | 3                      | 6.690                                                                      | 105                        | 3                      | 3                      | 9.350                                                        | 145                        | 3                      | 3                      |
| 4                   | 10.100                                            | 370                        | 4                      | 4                      | 5.050                                                                      | 135                        | 4                      | 4                      | 7.000                                                        | 185                        | 4                      | 4                      |
| 5                   | 8.090                                             | 410                        | 5                      | 5                      | 4.050                                                                      | 165                        | 5                      | 5                      | 5.600                                                        | 230                        | 5                      | 5                      |
| 6                   | 6.750                                             | 480                        | 6                      | 6                      | 3.350                                                                      | 190                        | 6                      | 6                      | 4.700                                                        | 265                        | 6                      | 6                      |
| 8                   | 5.050                                             | 620                        | 8                      | 8                      | 2.500                                                                      | 250                        | 8                      | 8                      | 3.500                                                        | 340                        | 8                      | 8                      |
| 10                  | 4.050                                             | 780                        | 10                     | 10                     | 2.050                                                                      | 320                        | 10                     | 10                     | 2.800                                                        | 430                        | 10                     | 10                     |
| 12                  | 3.370                                             | 750                        | 12                     | 12                     | 1.680                                                                      | 310                        | 12                     | 12                     | 2.350                                                        | 435                        | 12                     | 12                     |

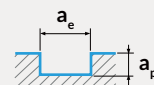
• Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

Per Acciai Inossidabili e leghe di Titanio  
For Stainless Steels and Titanium alloys

## 319RHPV

Z4

Frese toriche in metallo duro integrale microgran, elica passo variabile, divisione irregolare.  
Corner radius end mills in solid carbide micro grain, variable helix, irregular division.



|                     | Acciai Legati - Ghisa<br>Alloy Steels - Cast Iron |                            |                        |                        | Acciai Inos. Serie 300 - Titanio<br>Stainless Steels 300 Series - Titanium |                            |                        |                        | Acciai Inossidabili Serie 400<br>Stainless Steels 400 Series |                            |                        |                        |
|---------------------|---------------------------------------------------|----------------------------|------------------------|------------------------|----------------------------------------------------------------------------|----------------------------|------------------------|------------------------|--------------------------------------------------------------|----------------------------|------------------------|------------------------|
| Durezza<br>Hardness | -HB230                                            |                            |                        |                        |                                                                            |                            |                        |                        |                                                              |                            |                        |                        |
| d <sub>1</sub>      | n<br>(min <sup>-1</sup> )                         | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> )                                                  | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> )                                    | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |
| 1                   | 40.500                                            | 300                        | 1                      | 1                      | 20.000                                                                     | 250                        | 1                      | 1                      | 28.000                                                       | 160                        | 1                      | 1                      |
| 1,5                 | 27.000                                            | 300                        | 1,5                    | 1,5                    | 13.000                                                                     | 180                        | 1,5                    | 1,5                    | 18.500                                                       | 160                        | 1,5                    | 1,5                    |
| 2                   | 20.300                                            | 300                        | 2                      | 2                      | 10.000                                                                     | 150                        | 2                      | 2                      | 14.000                                                       | 160                        | 2                      | 2                      |
| 2,5                 | 16.200                                            | 300                        | 2,5                    | 2,5                    | 8.000                                                                      | 120                        | 2,5                    | 2,5                    | 11.000                                                       | 165                        | 2,5                    | 2,5                    |
| 3                   | 13.500                                            | 275                        | 3                      | 3                      | 6.690                                                                      | 105                        | 3                      | 3                      | 9.350                                                        | 145                        | 3                      | 3                      |
| 4                   | 10.100                                            | 370                        | 4                      | 4                      | 5.050                                                                      | 135                        | 4                      | 4                      | 7.000                                                        | 185                        | 4                      | 4                      |
| 5                   | 8.090                                             | 410                        | 5                      | 5                      | 4.050                                                                      | 165                        | 5                      | 5                      | 5.600                                                        | 230                        | 5                      | 5                      |
| 6                   | 6.750                                             | 480                        | 6                      | 6                      | 3.350                                                                      | 190                        | 6                      | 6                      | 4.700                                                        | 265                        | 6                      | 6                      |
| 8                   | 5.050                                             | 620                        | 8                      | 8                      | 2.500                                                                      | 250                        | 8                      | 8                      | 3.500                                                        | 340                        | 8                      | 8                      |
| 10                  | 4.050                                             | 780                        | 10                     | 10                     | 2.050                                                                      | 320                        | 10                     | 10                     | 2.800                                                        | 430                        | 10                     | 10                     |
| 12                  | 3.370                                             | 750                        | 12                     | 12                     | 1.680                                                                      | 310                        | 12                     | 12                     | 2.350                                                        | 435                        | 12                     | 12                     |

• Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters



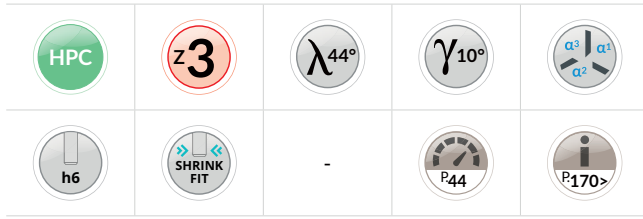
**Evolution**  
FRESE • END MILLS

**Talcarb**



**FRESE PER ALLUMINIO**  
End mills for Aluminium

**Frese a testa piana in metallo duro integrale micrograna, divisione irregolare.**  
Square end mills in solid carbide micro grain, irregular division.

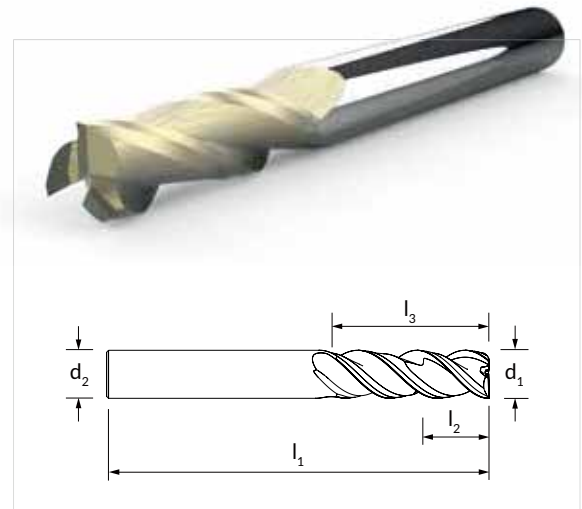


## Operazioni di fresatura | Milling strategies:



**Gruppo materiali lavorabili | Group of working materials:**

| P | M | K | N | S | H |                                                          |
|---|---|---|---|---|---|----------------------------------------------------------|
| - | - | - | ● | - | - | ● Raccomandato - Most suitable<br>○ Possibile - Possible |



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø | Raggio   Radius |
|-------------------------|-----------------|
| f8                      | -               |

|                                     |                                    |                                      |                                    |                                    |  |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|--|
| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter |  |
| $d_1$ (f8)                          | $l_1$                              | $l_2$                                | $l_3$                              | $d_2$                              |  |

|    |     |      |    |    |
|----|-----|------|----|----|
| 4  | 57  | 5,2  | 12 | 6  |
| 5  | 57  | 6,5  | 15 | 6  |
| 6  | 62  | 7,8  | 18 | 6  |
| 8  | 68  | 10,4 | 24 | 8  |
| 10 | 80  | 13   | 30 | 10 |
| 12 | 93  | 15,6 | 36 | 12 |
| 16 | 108 | 20,8 | 48 | 16 |
| 20 | 126 | 26   | 60 | 20 |

| 1267HPC   |                                                                                       |                               |
|-----------|---------------------------------------------------------------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code                                                         | Prezzo utensile<br>Tool Price |
|           |  | €                             |

|        |         |    |
|--------|---------|----|
| 445948 | 1267HPC | 4  |
| 445949 | 1267HPC | 5  |
| 445950 | 1267HPC | 6  |
| 445951 | 1267HPC | 8  |
| 445952 | 1267HPC | 10 |
| 445953 | 1267HPC | 12 |
| 445954 | 1267HPC | 16 |
| 445955 | 1267HPC | 20 |

Frese a testa piana a scarico lungo in metallo duro integrale micrograna, divisione irregolare.  
Square end mills long neck in solid carbide micro grain, irregular division.

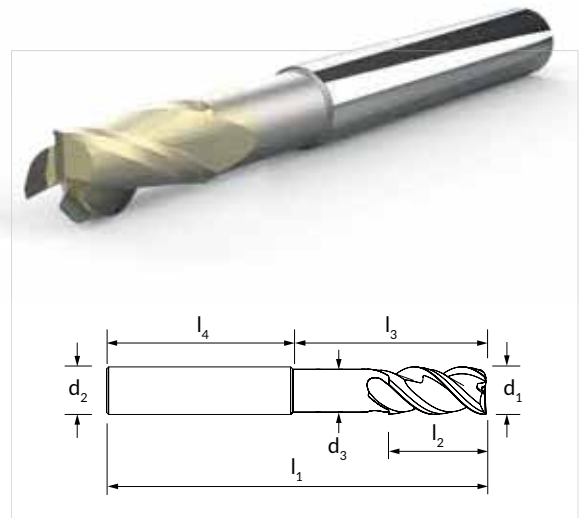
|  |  |   |  |  |
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## Operazioni di fresatura | Milling strategies:

|  |  |  |   |   |   |
|--|--|--|---|---|---|
|  |  |  | - | - | - |
|--|--|--|---|---|---|

## Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |                                                          |
|---|---|---|---|---|---|----------------------------------------------------------|
| - | - | - | ● | - | - | ● Raccomandato - Most suitable<br>○ Possibile - Possible |



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø | Raggio   Radius |
|-------------------------|-----------------|
| f8                      | -               |

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Lunghezza codolo<br>Length of shank | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|-------------------------------------|------------------------------------|---------------------------------|
| d <sub>1</sub> (f8)                 | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | l <sub>4</sub>                      | d <sub>2</sub>                     | d <sub>3</sub>                  |

|    |     |    |    |    |    |      |
|----|-----|----|----|----|----|------|
| 4  | 60  | 8  | 16 | 43 | 6  | 3.8  |
| 5  | 63  | 10 | 20 | 43 | 6  | 4.7  |
| 6  | 72  | 12 | 24 | 48 | 6  | 5.4  |
| 8  | 80  | 16 | 32 | 48 | 8  | 7.2  |
| 10 | 88  | 20 | 40 | 48 | 10 | 9.0  |
| 12 | 100 | 24 | 48 | 52 | 12 | 11.0 |
| 16 | 125 | 32 | 64 | 61 | 16 | 15.0 |
| 20 | 141 | 40 | 80 | 61 | 20 | 19.0 |
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| 1268HPC   |                               |                               |
|-----------|-------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
|           |                               | €                             |

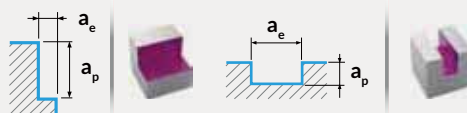
|        |            |  |
|--------|------------|--|
| 445956 | 1268HPC 4  |  |
| 445957 | 1268HPC 5  |  |
| 445958 | 1268HPC 6  |  |
| 445959 | 1268HPC 8  |  |
| 445960 | 1268HPC 10 |  |
| 445961 | 1268HPC 12 |  |
| 445962 | 1268HPC 16 |  |
| 445963 | 1268HPC 20 |  |
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|        |            |  |

Per Alluminio  
For Aluminium

## 1267HPC

Z3

Frese a testa piana in metallo duro integrale micrograna, divisione irregolare.  
Square end mills in solid carbide micro grain, irregular division.



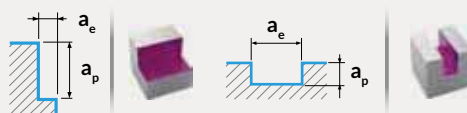
| Alluminio e materiali non ferrosi<br>Aluminum and Non ferrous materials |                           |                            |                        |                        |                           |                            |                        |                        |
|-------------------------------------------------------------------------|---------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|
| d <sub>1</sub>                                                          | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |
|                                                                         | Contornatura Side Milling |                            |                        |                        | Cave Slot Milling         |                            |                        |                        |
| 4                                                                       | 28.662                    | 3.439                      | 6,0                    | 2,0                    | 28.662                    | 3.439                      | 6,0                    | 4                      |
| 5                                                                       | 22.930                    | 3.783                      | 7,5                    | 2,5                    | 22.930                    | 3.783                      | 7,5                    | 5                      |
| 6                                                                       | 19.108                    | 4.013                      | 9,0                    | 3,0                    | 19.108                    | 4.013                      | 9,0                    | 6                      |
| 8                                                                       | 14.331                    | 4.084                      | 12,0                   | 4,0                    | 14.331                    | 4.084                      | 12,0                   | 8                      |
| 10                                                                      | 11.465                    | 4.127                      | 15,0                   | 5,0                    | 11.465                    | 4.127                      | 15,0                   | 10                     |
| 12                                                                      | 9.554                     | 3.869                      | 18,0                   | 6,0                    | 9.554                     | 3.869                      | 18,0                   | 12                     |
| 16                                                                      | 7.166                     | 3.225                      | 24,0                   | 8,0                    | 7.166                     | 3.225                      | 24,0                   | 16                     |
| 20                                                                      | 5.732                     | 3.010                      | 30,0                   | 10,0                   | 5.732                     | 3.010                      | 30,0                   | 20                     |

- Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

## 1268HPC

Z3

Frese a testa piana a scarico lungo in metallo duro integrale micrograna, divisione irregolare.  
Square end mills long neck in solid carbide micro grain, irregular division.



| Alluminio e materiali non ferrosi<br>Aluminum and Non ferrous materials |                           |                            |                        |                        |                           |                            |                        |                        |
|-------------------------------------------------------------------------|---------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|
| d <sub>1</sub>                                                          | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |
|                                                                         | Contornatura Side Milling |                            |                        |                        | Cave Slot Milling         |                            |                        |                        |
| 4                                                                       | 28.662                    | 2.580                      | 6,0                    | 1,2                    | 18.312                    | 1.483                      | 2,0                    | 4                      |
| 5                                                                       | 22.930                    | 3.096                      | 7,5                    | 1,5                    | 14.650                    | 1.538                      | 2,5                    | 5                      |
| 6                                                                       | 19.108                    | 3.153                      | 9,0                    | 1,8                    | 12.208                    | 1.465                      | 3,0                    | 6                      |
| 8                                                                       | 14.331                    | 3.225                      | 12,0                   | 2,4                    | 9.156                     | 1.511                      | 4,0                    | 8                      |
| 10                                                                      | 11.465                    | 3.096                      | 15,0                   | 3,0                    | 7.325                     | 1.538                      | 5,0                    | 10                     |
| 12                                                                      | 9.554                     | 3.296                      | 18,0                   | 3,6                    | 6.104                     | 1.465                      | 6,0                    | 12                     |
| 16                                                                      | 7.166                     | 2.580                      | 24,0                   | 4,8                    | 4.578                     | 1.305                      | 8,0                    | 16                     |
| 20                                                                      | 5.732                     | 2.494                      | 30,0                   | 6,0                    | 3.662                     | 1.209                      | 10,0                   | 20                     |

- Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters





 **Evolution**  
FRESE • END MILLS

**Talicarb**



**FRESE PER GRAFITE**  
End mills for Graphite

Frese a testa piana con scarico in metallo duro integrale micrograna.  
Square end mills long neck in solid carbide micro grain.

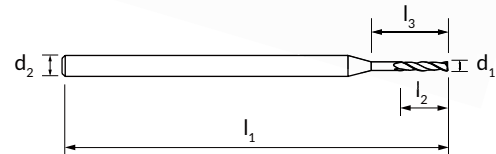
|  |  |   |  |   |
|--|--|---|--|---|
|  |  |   |  | - |
|  |  | - |  |   |

## Operazioni di fresatura | Milling strategies:

|  |  |   |   |   |   |
|--|--|---|---|---|---|
|  |  | - | - | - | - |
|--|--|---|---|---|---|

## Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |                                                          |
|---|---|---|---|---|---|----------------------------------------------------------|
| - | - | - | - | - | - | ● Raccomandato - Most suitable<br>○ Possibile - Possible |



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø      | Raggio   Radius |
|------------------------------|-----------------|
| d≤6: 0/-0.01   d>6: 0/-0.015 | -               |

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter |  |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|--|
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     |  |
| 0.5                                 | 50                                 | 0.7                                  | 6                                  | 4                                  |  |
| 0.5                                 | 50                                 | 1                                    | -                                  | 4                                  |  |
| 0.5                                 | 50                                 | 2                                    | -                                  | 4                                  |  |
| 1                                   | 60                                 | 5                                    | 10                                 | 4                                  |  |
| 1                                   | 60                                 | 5                                    | 15                                 | 4                                  |  |
| 1                                   | 60                                 | 5                                    | 20                                 | 4                                  |  |
| 1                                   | 60                                 | 5                                    | -                                  | 4                                  |  |
| 1.5                                 | 60                                 | 10                                   | 15                                 | 4                                  |  |
| 1.5                                 | 60                                 | 10                                   | 20                                 | 4                                  |  |
| 1.5                                 | 60                                 | 10                                   | -                                  | 4                                  |  |
| 2                                   | 60                                 | 10                                   | 15                                 | 4                                  |  |
| 2                                   | 60                                 | 10                                   | 20                                 | 4                                  |  |
| 2                                   | 70                                 | 10                                   | 25                                 | 4                                  |  |
| 2                                   | 80                                 | 10                                   | 30                                 | 4                                  |  |
| 2                                   | 60                                 | 10                                   | -                                  | 4                                  |  |
| 3                                   | 75                                 | 15                                   | 25                                 | 4                                  |  |
| 3                                   | 80                                 | 15                                   | 30                                 | 4                                  |  |
| 3                                   | 70                                 | 15                                   | -                                  | 4                                  |  |

| 1402HPX   |                               |  |                               |
|-----------|-------------------------------|--|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code |  | Prezzo utensile<br>Tool Price |
|           |                               |  | €                             |
| 441030    | 1402HPX .5X.7X6X50X4          |  |                               |
| 441029    | 1402HPX .5X1X50X4             |  |                               |
| 441237    | 1402HPX .5X2X50X4             |  |                               |
| 441032    | 1402HPX 1X5X10X60X4           |  |                               |
| 441033    | 1402HPX 1X5X15X60X4           |  |                               |
| 441034    | 1402HPX 1X5X20X60X4           |  |                               |
| 441031    | 1402HPX 1X5X60X4              |  |                               |
| 441036    | 1402HPX 1.5X10X15X60X4        |  |                               |
| 441037    | 1402HPX 1.5X10X20X60X4        |  |                               |
| 441035    | 1402HPX 1.5X10X60X4           |  |                               |
| 441239    | 1402HPX 2X10X15X60X4          |  |                               |
| 441240    | 1402HPX 2X10X20X60X4          |  |                               |
| 441241    | 1402HPX 2X10X25X70X4          |  |                               |
| 441242    | 1402HPX 2X10X30X80X4          |  |                               |
| 441238    | 1402HPX 2X10X60X4             |  |                               |
| 441244    | 1402HPX 3X15X25X75X4          |  |                               |
| 441245    | 1402HPX 3X15X30X80X4          |  |                               |
| 441243    | 1402HPX 3X15X70X4             |  |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | 1402HPX   |                               |                               |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|-----------|-------------------------------|-------------------------------|
|                                     |                                    |                                      |                                    |                                    | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| $d_1$                               | $l_1$                              | $l_2$                                | $l_3$                              | $d_2$                              |           |                               | €                             |
| 4                                   | 80                                 | 20                                   | -                                  | 4                                  | 441246    | 1402HPX 4X20X80X4             |                               |
| 4                                   | 100                                | 20                                   | -                                  | 4                                  | 441247    | 1402HPX 4X20X100X4            |                               |
| 5                                   | 100                                | 30                                   | -                                  | 6                                  | 441248    | 1402HPX 5X30X100X6            |                               |
| 6                                   | 100                                | 30                                   | -                                  | 6                                  | 441249    | 1402HPX 6X30X100X6            |                               |
| 6                                   | 150                                | 40                                   | -                                  | 6                                  | 441250    | 1402HPX 6X40X150X6            |                               |
| 8                                   | 150                                | 45                                   | -                                  | 8                                  | 441251    | 1402HPX 8X45X150X8            |                               |
| 10                                  | 150                                | 50                                   | -                                  | 10                                 | 441252    | 1402HPX 10X50X150X10          |                               |
| 12                                  | 150                                | 60                                   | -                                  | 12                                 | 441253    | 1402HPX 12X60X150X12          |                               |

**Frese sferiche con scarico in metallo duro integrale micrograna.**  
Ball nose end mills long neck in solid carbide micro grain.

|  |  |   |  |   |
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|  |  |   |  | - |
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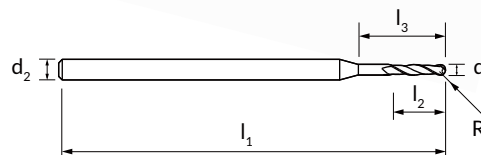
## Operazioni di fresatura | Milling strategies:

|   |   |   |   |  |   |
|---|---|---|---|--|---|
| - | - | - | - |  | - |
|---|---|---|---|--|---|

## Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| - | - | - | - | - | ● |

● Raccomandato - Most suitable  
○ Possibile - Possible



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø           | Raggio   Radius                         |
|-----------------------------------|-----------------------------------------|
| d ≤ 6: 0/-0.01<br>d > 6: 0/-0.015 | R ≤ 0.25: 0/-0.005<br>R > 0.25: 0/-0.01 |

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     |

|     |      |     |    |    |   |
|-----|------|-----|----|----|---|
| 0.5 | 0.25 | 50  | 2  | 5  | 4 |
| 0.5 | 0.25 | 50  | 2  | -  | 4 |
| 1   | 0.5  | 60  | 5  | 10 | 4 |
| 1   | 0.5  | 60  | 5  | 15 | 4 |
| 1   | 0.5  | 80  | 5  | 20 | 4 |
| 1   | 0.5  | 80  | 5  | 25 | 4 |
| 1   | 0.5  | 60  | 5  | -  | 4 |
| 1.5 | 0.75 | 60  | 10 | 15 | 4 |
| 1.5 | 0.75 | 60  | 10 | 20 | 4 |
| 1.5 | 0.75 | 60  | 10 | -  | 4 |
| 2   | 1    | 60  | 10 | 20 | 4 |
| 2   | 1    | 80  | 10 | 30 | 4 |
| 2   | 1    | 100 | 10 | 30 | 4 |
| 2   | 1    | 80  | 10 | 40 | 4 |
| 2   | 1    | 100 | 10 | 40 | 4 |
| 2   | 1    | 60  | 10 | -  | 4 |
| 2.5 | 1.25 | 70  | 10 | 20 | 4 |
| 3   | 1.5  | 70  | 10 | 20 | 4 |

| 402RHPX   |                               |                               |
|-----------|-------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
|           |                               | €                             |

|        |         |                     |
|--------|---------|---------------------|
| 441254 | 402RHPX | .5X.25X2X5X50X4     |
| 441255 | 402RHPX | .5X.25X2X50X4       |
| 441257 | 402RHPX | 1X.5X5X10X60X4      |
| 441258 | 402RHPX | 1X.5X5X15X60X4      |
| 441259 | 402RHPX | 1X.5X5X20X80X4      |
| 441260 | 402RHPX | 1X.5X5X25X80X4      |
| 441256 | 402RHPX | 1X.5X5X60X4         |
| 441262 | 402RHPX | 1.5X.75X10X15X60X4  |
| 441263 | 402RHPX | 1.5X.75X10X20X60X4  |
| 441261 | 402RHPX | 1.5X.75X10X60X4     |
| 441268 | 402RHPX | 2X1X10X20X60X4      |
| 441269 | 402RHPX | 2X1X10X30X80X4      |
| 441270 | 402RHPX | 2X1X10X30X100X4     |
| 441271 | 402RHPX | 2X1X10X40X80X4      |
| 441272 | 402RHPX | 2X1X10X40X100X4     |
| 441444 | 402RHPX | 2X1X10X60X4         |
| 441273 | 402RHPX | 2.5X1.25X10X20X70X4 |
| 441274 | 402RHPX | 3X1.5X10X20X70X4    |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

|                                     |                                 |                                    |                                      |                                    |                                    | 402RHPX   |                               |                                                                                     |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|-----------|-------------------------------|-------------------------------------------------------------------------------------|-------------------------------|
| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | ART. NUM. | Codice d'ordine<br>Order code |  | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     |           |                               |                                                                                     | €                             |
| 3                                   | 1.5                             | 80                                 | 10                                   | 30                                 | 4                                  | 441275    | 402RHPX                       | 3X1.5X10X30X80X4                                                                    |                               |
| 4                                   | 2                               | 100                                | 20                                   | -                                  | 4                                  | 441277    | 402RHPX                       | 4X2X20X100X4                                                                        |                               |
| 4                                   | 2                               | 130                                | 20                                   | -                                  | 4                                  | 441278    | 402RHPX                       | 4X2X20X130X4                                                                        |                               |
| 4                                   | 2                               | 80                                 | 20                                   | -                                  | 4                                  | 441276    | 402RHPX                       | 4X2X20X80X4                                                                         |                               |
| 5                                   | 2.5                             | 100                                | 25                                   | -                                  | 6                                  | 441279    | 402RHPX                       | 5X2.5X25X100X6                                                                      |                               |
| 6                                   | 3                               | 100                                | 30                                   | -                                  | 6                                  | 441281    | 402RHPX                       | 6X3X30X100X6                                                                        |                               |
| 6                                   | 3                               | 80                                 | 30                                   | -                                  | 6                                  | 441280    | 402RHPX                       | 6X3X30X80X6                                                                         |                               |
| 6                                   | 3                               | 150                                | 40                                   | -                                  | 6                                  | 441282    | 402RHPX                       | 6X3X40X150X6                                                                        |                               |
| 8                                   | 4                               | 120                                | 45                                   | -                                  | 8                                  | 441283    | 402RHPX                       | 8X4X45X120X8                                                                        |                               |
| 8                                   | 4                               | 150                                | 45                                   | -                                  | 8                                  | 441284    | 402RHPX                       | 8X4X45X150X8                                                                        |                               |
| 10                                  | 5                               | 120                                | 50                                   | -                                  | 10                                 | 441285    | 402RHPX                       | 10X5X50X120X10                                                                      |                               |
| 10                                  | 5                               | 150                                | 50                                   | -                                  | 10                                 | 441286    | 402RHPX                       | 10X5X50X150X10                                                                      |                               |
| 12                                  | 6                               | 130                                | 50                                   | -                                  | 12                                 | 441287    | 402RHPX                       | 12X6X50X130X12                                                                      |                               |
| 12                                  | 6                               | 150                                | 50                                   | -                                  | 12                                 | 441288    | 402RHPX                       | 12X6X50X150X12                                                                      |                               |

**Frese sferiche con scarico in metallo duro integrale micrograna.**  
Ball nose end mills long neck in solid carbide micro grain.

|  |  |   |  |   |
|--|--|---|--|---|
|  |  |   |  | - |
|  |  | - |  |   |

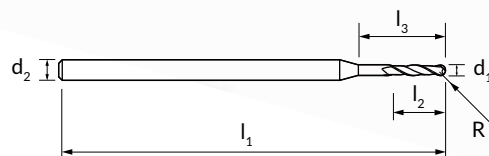
## Operazioni di fresatura | Milling strategies:

|   |   |   |   |  |   |
|---|---|---|---|--|---|
| - | - | - | - |  | - |
|---|---|---|---|--|---|

## Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| - | - | - | - | - | ● |

● Raccomandato - Most suitable  
○ Possibile - Possible



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø           | Raggio   Radius                         |
|-----------------------------------|-----------------------------------------|
| d ≤ 6: 0/-0.01<br>d > 6: 0/-0.015 | R ≤ 0.25: 0/-0.005<br>R > 0.25: 0/-0.01 |

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     |
| 0.5                                 | 0.25                            | 45                                 | 2                                    | 3                                  | 4                                  |
| 0.5                                 | 0.25                            | 45                                 | 2                                    | 4                                  | 4                                  |
| 0.5                                 | 0.25                            | 45                                 | 2                                    | -                                  | 4                                  |
| 0.5                                 | 0.25                            | 45                                 | 2                                    | 5                                  | 4                                  |
| 0.5                                 | 0.25                            | 45                                 | 2                                    | 6                                  | 4                                  |
| 0.5                                 | 0.25                            | 45                                 | 2                                    | 8                                  | 4                                  |
| 0.6                                 | 0.3                             | 45                                 | 2                                    | 10                                 | 4                                  |
| 0.6                                 | 0.3                             | 45                                 | 2                                    | 12                                 | 4                                  |
| 0.6                                 | 0.3                             | 45                                 | 2                                    | 3                                  | 4                                  |
| 0.6                                 | 0.3                             | 45                                 | 2                                    | 4                                  | 4                                  |
| 0.6                                 | 0.3                             | 45                                 | 2                                    | -                                  | 4                                  |
| 0.6                                 | 0.3                             | 45                                 | 2                                    | 5                                  | 4                                  |
| 0.6                                 | 0.3                             | 45                                 | 2                                    | 6                                  | 4                                  |
| 0.6                                 | 0.3                             | 45                                 | 2                                    | 8                                  | 4                                  |
| 0.8                                 | 0.4                             | 45                                 | 3                                    | 10                                 | 4                                  |
| 0.8                                 | 0.4                             | 45                                 | 3                                    | 15                                 | 4                                  |
| 0.8                                 | 0.4                             | 50                                 | 3                                    | 20                                 | 4                                  |
| 0.8                                 | 0.4                             | 45                                 | 3                                    | 4                                  | 4                                  |

| 422RHPD   |                               |  |                               |
|-----------|-------------------------------|--|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code |  | Prezzo utensile<br>Tool Price |
|           |                               |  | €                             |
| 440947    | 422RHPD .5X.25X2X3X45X4       |  |                               |
| 440948    | 422RHPD .5X.25X2X4X45X4       |  |                               |
| 440946    | 422RHPD .5X.25X2X45X4         |  |                               |
| 440949    | 422RHPD .5X.25X2X5X45X4       |  |                               |
| 440950    | 422RHPD .5X.25X2X6X45X4       |  |                               |
| 440951    | 422RHPD .5X.25X2X8X45X4       |  |                               |
| 440958    | 422RHPD .6X.3X2X10X45X4       |  |                               |
| 440959    | 422RHPD .6X.3X2X12X45X4       |  |                               |
| 440953    | 422RHPD .6X.3X2X3X45X4        |  |                               |
| 440954    | 422RHPD .6X.3X2X4X45X4        |  |                               |
| 440952    | 422RHPD .6X.3X2X45X4          |  |                               |
| 440955    | 422RHPD .6X.3X2X5X45X4        |  |                               |
| 440956    | 422RHPD .6X.3X2X6X45X4        |  |                               |
| 440957    | 422RHPD .6X.3X2X8X45X4        |  |                               |
| 440965    | 422RHPD .8X.4X3X10X45X4       |  |                               |
| 440966    | 422RHPD .8X.4X3X15X45X4       |  |                               |
| 440967    | 422RHPD .8X.4X3X20X50X4       |  |                               |
| 440961    | 422RHPD .8X.4X3X4X45X4        |  |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     |

|     |      |     |    |    |   |
|-----|------|-----|----|----|---|
| 0.8 | 0.4  | 45  | 3  | -  | 4 |
| 0.8 | 0.4  | 45  | 3  | 5  | 4 |
| 0.8 | 0.4  | 45  | 3  | 6  | 4 |
| 0.8 | 0.4  | 45  | 3  | 8  | 4 |
| 1   | 0.5  | 60  | 3  | 10 | 4 |
| 1   | 0.5  | 60  | 3  | 12 | 4 |
| 1   | 0.5  | 60  | 3  | 15 | 4 |
| 1   | 0.5  | 60  | 3  | 20 | 4 |
| 1   | 0.5  | 80  | 3  | 25 | 4 |
| 1   | 0.5  | 80  | 3  | 30 | 4 |
| 1   | 0.5  | 80  | 3  | 35 | 4 |
| 1   | 0.5  | 60  | 3  | 4  | 4 |
| 1   | 0.5  | 80  | 3  | 40 | 4 |
| 1   | 0.5  | 60  | 3  | 5  | 4 |
| 1   | 0.5  | 60  | 3  | 6  | 4 |
| 1   | 0.5  | 60  | 3  | -  | 4 |
| 1   | 0.5  | 60  | 3  | 8  | 4 |
| 1.5 | 0.75 | 60  | 6  | 10 | 4 |
| 1.5 | 0.75 | 60  | 6  | 12 | 4 |
| 1.5 | 0.75 | 60  | 6  | 15 | 4 |
| 1.5 | 0.75 | 60  | 6  | 20 | 4 |
| 1.5 | 0.75 | 80  | 6  | 25 | 4 |
| 1.5 | 0.75 | 80  | 6  | 30 | 4 |
| 1.5 | 0.75 | 80  | 6  | 35 | 4 |
| 1.5 | 0.75 | 80  | 6  | 40 | 4 |
| 1.5 | 0.75 | 60  | 6  | -  | 4 |
| 1.5 | 0.75 | 60  | 6  | 8  | 4 |
| 2   | 1    | 80  | 8  | 10 | 4 |
| 2   | 1    | 80  | 8  | 15 | 4 |
| 2   | 1    | 80  | 8  | 20 | 4 |
| 2   | 1    | 80  | 8  | 25 | 4 |
| 2   | 1    | 80  | 8  | 30 | 4 |
| 2   | 1    | 80  | 8  | 35 | 4 |
| 2   | 1    | 80  | 8  | 40 | 4 |
| 2   | 1    | 100 | 8  | 45 | 4 |
| 2   | 1    | 100 | 8  | 50 | 4 |
| 2   | 1    | 60  | 8  | -  | 4 |
| 2   | 1    | 100 | 8  | 60 | 4 |
| 3   | 1.5  | 100 | 12 | 20 | 4 |

| 422RHPD   |                               |                                                                                     |                               |
|-----------|-------------------------------|-------------------------------------------------------------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code |  | Prezzo utensile<br>Tool Price |
|           |                               |                                                                                     | €                             |

|        |         |                   |
|--------|---------|-------------------|
| 440960 | 422RHPD | .8X.4X3X45X4      |
| 440962 | 422RHPD | .8X.4X3X5X45X4    |
| 440963 | 422RHPD | .8X.4X3X6X45X4    |
| 440964 | 422RHPD | .8X.4X3X8X45X4    |
| 440973 | 422RHPD | 1X.5X3X10X60X4    |
| 440974 | 422RHPD | 1X.5X3X12X60X4    |
| 440975 | 422RHPD | 1X.5X3X15X60X4    |
| 440976 | 422RHPD | 1X.5X3X20X60X4    |
| 440977 | 422RHPD | 1X.5X3X25X80X4    |
| 440978 | 422RHPD | 1X.5X3X30X80X4    |
| 440979 | 422RHPD | 1X.5X3X35X80X4    |
| 440969 | 422RHPD | 1X.5X3X4X60X4     |
| 440980 | 422RHPD | 1X.5X3X40X80X4    |
| 440970 | 422RHPD | 1X.5X3X5X60X4     |
| 440971 | 422RHPD | 1X.5X3X6X60X4     |
| 440968 | 422RHPD | 1X.5X3X60X4       |
| 440972 | 422RHPD | 1X.5X3X8X60X4     |
| 440983 | 422RHPD | 1.5X.75X6X10X60X4 |
| 440984 | 422RHPD | 1.5X.75X6X12X60X4 |
| 440985 | 422RHPD | 1.5X.75X6X15X60X4 |
| 440986 | 422RHPD | 1.5X.75X6X20X60X4 |
| 440987 | 422RHPD | 1.5X.75X6X25X80X4 |
| 440988 | 422RHPD | 1.5X.75X6X30X80X4 |
| 440989 | 422RHPD | 1.5X.75X6X35X80X4 |
| 440990 | 422RHPD | 1.5X.75X6X40X80X4 |
| 440981 | 422RHPD | 1.5X.75X6X60X4    |
| 440982 | 422RHPD | 1.5X.75X6X8X60X4  |
| 440992 | 422RHPD | 2X1X8X10X80X4     |
| 440993 | 422RHPD | 2X1X8X15X80X4     |
| 440994 | 422RHPD | 2X1X8X20X80X4     |
| 440995 | 422RHPD | 2X1X8X25X80X4     |
| 440996 | 422RHPD | 2X1X8X30X80X4     |
| 440997 | 422RHPD | 2X1X8X35X80X4     |
| 440998 | 422RHPD | 2X1X8X40X80X4     |
| 440999 | 422RHPD | 2X1X8X45X100X4    |
| 441000 | 422RHPD | 2X1X8X50X100X4    |
| 440991 | 422RHPD | 2X1X8X60X4        |
| 441001 | 422RHPD | 2X1X8X60X100X4    |
| 441002 | 422RHPD | 3X1.5X12X20X100X4 |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

Frese sferiche con scarico in metallo duro integrale micrograna.  
Ball nose end mills long neck in solid carbide micro grain.

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     |

|    |     |     |    |    |    |
|----|-----|-----|----|----|----|
| 3  | 1.5 | 100 | 12 | 25 | 4  |
| 3  | 1.5 | 100 | 12 | 30 | 4  |
| 3  | 1.5 | 100 | 12 | 35 | 4  |
| 3  | 1.5 | 100 | 12 | 40 | 4  |
| 3  | 1.5 | 100 | 12 | 50 | 4  |
| 3  | 1.5 | 100 | 12 | 60 | 4  |
| 4  | 2   | 100 | 16 | -  | 4  |
| 4  | 2   | 130 | 16 | -  | 4  |
| 4  | 2   | 150 | 16 | -  | 4  |
| 4  | 2   | 80  | 16 | 30 | 4  |
| 4  | 2   | 100 | 16 | 40 | 4  |
| 4  | 2   | 130 | 16 | 40 | 4  |
| 4  | 2   | 150 | 16 | 50 | 4  |
| 4  | 2   | 60  | 16 | -  | 4  |
| 4  | 2   | 80  | 16 | -  | 4  |
| 5  | 2.5 | 105 | 16 | 20 | 6  |
| 6  | 3   | 105 | 25 | -  | 6  |
| 6  | 3   | 150 | 25 | -  | 6  |
| 6  | 3   | 105 | 25 | 40 | 6  |
| 6  | 3   | 150 | 25 | 50 | 6  |
| 6  | 3   | 75  | 25 | -  | 6  |
| 8  | 4   | 105 | 30 | -  | 8  |
| 8  | 4   | 150 | 35 | -  | 8  |
| 10 | 5   | 105 | 35 | -  | 10 |
| 10 | 5   | 150 | 40 | -  | 10 |
| 12 | 6   | 150 | 50 | -  | 12 |

| 422RHPD   |                               |                               |
|-----------|-------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
|           |                               | €                             |

|        |                           |
|--------|---------------------------|
| 441003 | 422RHPD 3X1.5X12X25X100X4 |
| 441004 | 422RHPD 3X1.5X12X30X100X4 |
| 441005 | 422RHPD 3X1.5X12X35X100X4 |
| 441006 | 422RHPD 3X1.5X12X40X100X4 |
| 441007 | 422RHPD 3X1.5X12X50X100X4 |
| 441008 | 422RHPD 3X1.5X12X60X100X4 |
| 441012 | 422RHPD 4X2X16X100X4      |
| 441014 | 422RHPD 4X2X16X130X4      |
| 441016 | 422RHPD 4X2X16X150X4      |
| 441011 | 422RHPD 4X2X16X30X80X4    |
| 441013 | 422RHPD 4X2X16X40X100X4   |
| 441015 | 422RHPD 4X2X16X40X130X4   |
| 441017 | 422RHPD 4X2X16X50X150X4   |
| 441009 | 422RHPD 4X2X16X60X4       |
| 441010 | 422RHPD 4X2X16X80X4       |
| 441018 | 422RHPD 5X2.5X16X20X105X6 |
| 441020 | 422RHPD 6X3X25X105X6      |
| 441022 | 422RHPD 6X3X25X150X6      |
| 441021 | 422RHPD 6X3X25X40X105X6   |
| 441023 | 422RHPD 6X3X25X50X150X6   |
| 441019 | 422RHPD 6X3X25X75X6       |
| 441024 | 422RHPD 8X4X30X105X8      |
| 441025 | 422RHPD 8X4X35X150X8      |
| 441026 | 422RHPD 10X5X35X105X10    |
| 441027 | 422RHPD 10X5X40X150X10    |
| 441028 | 422RHPD 12X6X50X150X12    |

**Frese sferiche con scarico in metallo duro integrale micrograna.**  
Ball nose end mills long neck in solid carbide micro grain.

|  |  |   |  |   |
|--|--|---|--|---|
|  |  |   |  | - |
|  |  | - |  |   |

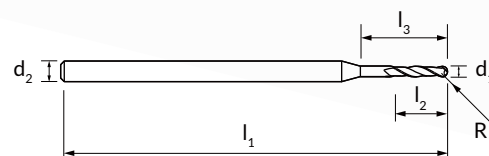
## Operazioni di fresatura | Milling strategies:

|   |   |   |   |  |   |
|---|---|---|---|--|---|
| - | - | - | - |  | - |
|---|---|---|---|--|---|

## Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| - | - | - | - | - | ● |

● Raccomandato - Most suitable  
○ Possibile - Possible



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø           | Raggio   Radius                         |
|-----------------------------------|-----------------------------------------|
| d ≤ 6: 0/-0.01<br>d > 6: 0/-0.015 | R ≤ 0.25: 0/-0.005<br>R > 0.25: 0/-0.01 |

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     |
| 1.5                                 | 0.75                            | 60                                 | 4.5                                  | 10                                 | 4                                  |
| 1.5                                 | 0.75                            | 60                                 | 4.5                                  | 15                                 | 4                                  |
| 1.5                                 | 0.75                            | 60                                 | 4.5                                  | 20                                 | 4                                  |
| 1.5                                 | 0.75                            | 60                                 | 4.5                                  | 25                                 | 4                                  |
| 1.5                                 | 0.75                            | 60                                 | 4.5                                  | -                                  | 4                                  |
| 2                                   | 1                               | 80                                 | 6                                    | 10                                 | 4                                  |
| 2                                   | 1                               | 80                                 | 6                                    | 20                                 | 4                                  |
| 2                                   | 1                               | 80                                 | 6                                    | 30                                 | 4                                  |
| 2                                   | 1                               | 80                                 | 6                                    | 40                                 | 4                                  |
| 2                                   | 1                               | 60                                 | 6                                    | -                                  | 4                                  |
| 3                                   | 1.5                             | 100                                | 8                                    | 15                                 | 4                                  |
| 3                                   | 1.5                             | 100                                | 8                                    | 20                                 | 4                                  |
| 3                                   | 1.5                             | 100                                | 8                                    | 30                                 | 4                                  |
| 3                                   | 1.5                             | 100                                | 8                                    | 40                                 | 4                                  |
| 3                                   | 1.5                             | 100                                | 8                                    | 50                                 | 4                                  |
| 3                                   | 1.5                             | 60                                 | 8                                    | -                                  | 4                                  |
| 4                                   | 2                               | 100                                | 16                                   | -                                  | 4                                  |
| 4                                   | 2                               | 130                                | 16                                   | -                                  | 4                                  |

| 424RHPD   |                               |                     |                               |
|-----------|-------------------------------|---------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code |                     | Prezzo utensile<br>Tool Price |
|           |                               |                     | €                             |
| 440911    | 424RHPD                       | 1.5X.75X4.5X10X60X4 |                               |
| 440913    | 424RHPD                       | 1.5X.75X4.5X15X60X4 |                               |
| 440914    | 424RHPD                       | 1.5X.75X4.5X20X60X4 |                               |
| 440915    | 424RHPD                       | 1.5X.75X4.5X25X60X4 |                               |
| 440912    | 424RHPD                       | 1.5X.75X4.5X60X4    |                               |
| 440917    | 424RHPD                       | 2X1X6X10X80X4       |                               |
| 440918    | 424RHPD                       | 2X1X6X20X80X4       |                               |
| 440919    | 424RHPD                       | 2X1X6X30X80X4       |                               |
| 440920    | 424RHPD                       | 2X1X6X40X80X4       |                               |
| 440916    | 424RHPD                       | 2X1X6X60X4          |                               |
| 440922    | 424RHPD                       | 3X1.5X8X15X100X4    |                               |
| 440923    | 424RHPD                       | 3X1.5X8X20X100X4    |                               |
| 440924    | 424RHPD                       | 3X1.5X8X30X100X4    |                               |
| 440925    | 424RHPD                       | 3X1.5X8X40X100X4    |                               |
| 440926    | 424RHPD                       | 3X1.5X8X50X100X4    |                               |
| 440921    | 424RHPD                       | 3X1.5X8X60X4        |                               |
| 440929    | 424RHPD                       | 4X2X16X100X4        |                               |
| 440930    | 424RHPD                       | 4X2X16X130X4        |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

**Frese sferiche con scarico in metallo duro integrale micrograna.**  
**Ball nose end mills long neck in solid carbide micro grain.**

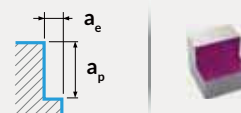
| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     |
| 4                                   | 2                               | 60                                 | 16                                   | -                                  | 4                                  |
| 4                                   | 2                               | 80                                 | 16                                   | -                                  | 4                                  |
| 6                                   | 3                               | 75                                 | 16                                   | 25                                 | 6                                  |
| 6                                   | 3                               | 105                                | 16                                   | 25                                 | 6                                  |
| 6                                   | 3                               | 150                                | 16                                   | 30                                 | 6                                  |
| 8                                   | 4                               | 75                                 | 20                                   | 30                                 | 8                                  |
| 8                                   | 4                               | 105                                | 20                                   | 30                                 | 8                                  |
| 8                                   | 4                               | 150                                | 20                                   | 35                                 | 8                                  |
| 8                                   | 4                               | 200                                | 20                                   | 40                                 | 8                                  |
| 10                                  | 5                               | 75                                 | 22                                   | 35                                 | 10                                 |
| 10                                  | 5                               | 105                                | 22                                   | 35                                 | 10                                 |
| 10                                  | 5                               | 160                                | 22                                   | 40                                 | 10                                 |
| 10                                  | 5                               | 200                                | 22                                   | 50                                 | 10                                 |
| 12                                  | 6                               | 105                                | 25                                   | 50                                 | 12                                 |
| 12                                  | 6                               | 150                                | 25                                   | 50                                 | 12                                 |
| 12                                  | 6                               | 200                                | 25                                   | 60                                 | 12                                 |

| 424RHPD   |                               |                                                                                     |                               |
|-----------|-------------------------------|-------------------------------------------------------------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code |  | Prezzo utensile<br>Tool Price |
|           |                               |                                                                                     | €                             |
| 440927    | 424RHPD 4X2X16X60X4           |                                                                                     |                               |
| 440928    | 424RHPD 4X2X16X80X4           |                                                                                     |                               |
| 440931    | 424RHPD 6X3X16X25X75X6        |                                                                                     |                               |
| 440932    | 424RHPD 6X3X16X25X105X6       |                                                                                     |                               |
| 440933    | 424RHPD 6X3X16X30X150X6       |                                                                                     |                               |
| 440934    | 424RHPD 8X4X20X30X75X8        |                                                                                     |                               |
| 440936    | 424RHPD 8X4X20X30X105X8       |                                                                                     |                               |
| 440937    | 424RHPD 8X4X20X35X150X8       |                                                                                     |                               |
| 440938    | 424RHPD 8X4X20X40X200X8       |                                                                                     |                               |
| 440939    | 424RHPD 10X5X22X35X75X10      |                                                                                     |                               |
| 440940    | 424RHPD 10X5X22X35X105X10     |                                                                                     |                               |
| 440941    | 424RHPD 10X5X22X40X160X10     |                                                                                     |                               |
| 440942    | 424RHPD 10X5X22X50X200X10     |                                                                                     |                               |
| 440943    | 424RHPD 12X6X25X50X105X12     |                                                                                     |                               |
| 440944    | 424RHPD 12X6X25X50X150X12     |                                                                                     |                               |
| 440945    | 424RHPD 12X6X25X60X200X12     |                                                                                     |                               |

## 1402HPX

Z2

Frese a testa piana con scarico in metallo duro integrale micrograna.  
Square end mills long neck in solid carbide micro grain.



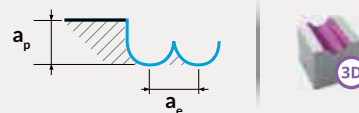
| d <sub>1</sub> | Grafite<br>Graphite       |                            |                        |                        |  |
|----------------|---------------------------|----------------------------|------------------------|------------------------|--|
|                | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |  |
| 2              | 8.000                     | 250                        | 2,0                    | 0,2                    |  |
| 3              | 8.000                     | 380                        | 3,0                    | 0,3                    |  |
| 4              | 8.000                     | 510                        | 4,0                    | 0,4                    |  |
| 5              | 8.000                     | 640                        | 5,0                    | 0,5                    |  |
| 6              | 8.000                     | 770                        | 6,0                    | 0,6                    |  |
| 8              | 8.000                     | 1.000                      | 8,0                    | 0,8                    |  |
| 10             | 8.000                     | 1.250                      | 10,0                   | 1,0                    |  |

• Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

## 402RHPX

Z2

Frese sferiche con scarico in metallo duro integrale micrograna.  
Ball nose end mills long neck in solid carbide micro grain.



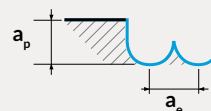
| R    | Grafite<br>Graphite       |                            |                        |                        |  |
|------|---------------------------|----------------------------|------------------------|------------------------|--|
|      | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |  |
| 0,25 | 32.000                    | 1.000                      | 0,50                   | 0,08                   |  |
| 0,50 | 32.000                    | 1.600                      | 1,00                   | 0,15                   |  |
| 0,75 | 28.000                    | 1.600                      | 1,50                   | 0,23                   |  |
| 1,00 | 24.000                    | 1.600                      | 2,00                   | 0,30                   |  |
| 1,50 | 16.000                    | 1.600                      | 3,00                   | 0,45                   |  |
| 2,00 | 12.000                    | 1.600                      | 4,00                   | 0,60                   |  |
| 2,50 | 9.600                     | 1.400                      | 5,00                   | 0,75                   |  |
| 3,00 | 8.000                     | 1.200                      | 6,00                   | 0,90                   |  |
| 4,00 | 6.400                     | 640                        | 8,00                   | 1,20                   |  |
| 5,00 | 5.200                     | 650                        | 10,00                  | 1,50                   |  |
| 6,00 | 4.300                     | 600                        | 12,00                  | 1,80                   |  |
| 5,00 | 3.200                     | 280                        | 10,00                  | 1,50                   |  |
| 6,00 | 2.700                     | 330                        | 12,00                  | 1,80                   |  |

• Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

## 422RHPD

Z2

Frese sferiche con scarico in metallo duro integrale micrograna.  
Ball nose end mills long neck in solid carbide micro grain.



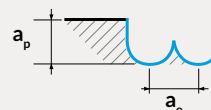
| d <sub>1</sub> | Grafite<br>Graphite       |                            |                        |                        |  |
|----------------|---------------------------|----------------------------|------------------------|------------------------|--|
|                | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |  |
| 1,5            | 16.000                    | 320                        | 0,20                   | 0,30                   |  |
| 2,0            | 16.000                    | 592                        | 0,40                   | 0,40                   |  |
| 3,0            | 16.000                    | 960                        | 0,60                   | 0,60                   |  |
| 40             | 16.000                    | 1.520                      | 0,80                   | 0,80                   |  |
| 6,0            | 15.000                    | 2.100                      | 1,20                   | 1,20                   |  |
| 8,0            | 13.000                    | 2.210                      | 1,60                   | 1,60                   |  |
| 10,0           | 12.000                    | 2.280                      | 2,00                   | 2,00                   |  |
| 120            | 10.000                    | 2.300                      | 2,40                   | 2,40                   |  |

- Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

## 424RHPD

Z4

Frese sferiche con scarico in metallo duro integrale micrograna.  
Ball nose end mills long neck in solid carbide micro grain.



| d <sub>1</sub> | Grafite<br>Graphite       |                            |                        |                        |  |
|----------------|---------------------------|----------------------------|------------------------|------------------------|--|
|                | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |  |
| 1,5            | 16.000                    | 700                        | 0,20                   | 0,30                   |  |
| 2,0            | 16.000                    | 1.200                      | 0,40                   | 0,40                   |  |
| 3,0            | 16.000                    | 2.000                      | 0,60                   | 0,60                   |  |
| 4,0            | 16.000                    | 3.100                      | 0,80                   | 0,80                   |  |
| 6,0            | 15.000                    | 4.400                      | 1,20                   | 1,20                   |  |
| 80             | 13.000                    | 4.500                      | 1,60                   | 1,60                   |  |
| 10,0           | 12.000                    | 4.600                      | 2,00                   | 2,00                   |  |
| 12,0           | 10.000                    | 4.700                      | 2,40                   | 2,40                   |  |

- Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters





**Evolution**  
FRESE • END MILLS

**Talicarb**

HPA



**FRESE PER ACCIAI TEMPRATI FINO A 55 HRC**  
End Mills for hardened steels up to 55 HRC

Frese a testa piana in metallo duro integrale micrograna.  
Square end mills in solid carbide micro grain.

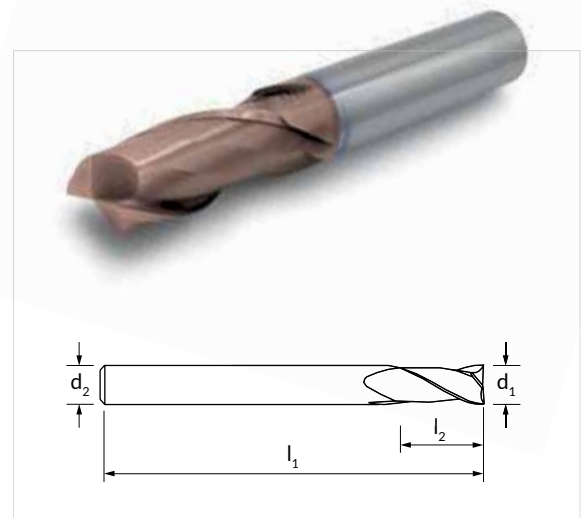
|  |  |   |  |   |
|--|--|---|--|---|
|  |  |   |  | - |
|  |  | - |  |   |

## Operazioni di fresatura | Milling strategies:

|  |  |   |   |   |   |
|--|--|---|---|---|---|
|  |  | - | - | - | - |
|--|--|---|---|---|---|

## Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |                                                          |
|---|---|---|---|---|---|----------------------------------------------------------|
|   |   |   |   |   |   | ● Raccomandato - Most suitable<br>○ Possibile - Possible |



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø      | Raggio   Radius |
|------------------------------|-----------------|
| d≤6: 0/-0.01   d>6: 0/-0.015 | -               |

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |

|     |    |     |   |
|-----|----|-----|---|
| 0.2 | 45 | 0.3 | 4 |
| 0.3 | 45 | 0.5 | 4 |
| 0.4 | 45 | 0.8 | 4 |
| 0.5 | 45 | 1   | 4 |
| 0.6 | 45 | 1.2 | 4 |
| 0.7 | 45 | 1.4 | 4 |
| 0.8 | 45 | 1.6 | 4 |
| 1   | 45 | 2.5 | 4 |
| 1   | 45 | 2.5 | 6 |
| 1.2 | 45 | 3   | 4 |
| 1.5 | 45 | 4   | 4 |
| 1.5 | 45 | 4   | 6 |
| 2   | 45 | 6   | 4 |
| 2   | 45 | 6   | 6 |
| 2.5 | 45 | 8   | 4 |
| 2.5 | 45 | 8   | 6 |
| 3   | 45 | 8   | 4 |
| 3   | 45 | 8   | 6 |

| 1412HPA   |                               |                               |
|-----------|-------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
|           |                               | €                             |

|        |                     |
|--------|---------------------|
| 445723 | 1412HPA .2X.3X45X4  |
| 445724 | 1412HPA .3X.5X45X4  |
| 445725 | 1412HPA .4X.8X45X4  |
| 445726 | 1412HPA .5X1X45X4   |
| 445727 | 1412HPA .6X1.2X45X4 |
| 445728 | 1412HPA .7X1.4X45X4 |
| 445729 | 1412HPA .8X1.6X45X4 |
| 445345 | 1412HPA 1X2.5X45X4  |
| 445730 | 1412HPA 1X2.5X45X6  |
| 445731 | 1412HPA 1.2X3X45X4  |
| 445346 | 1412HPA 1.5X4X45X4  |
| 445732 | 1412HPA 1.5X4X45X6  |
| 445347 | 1412HPA 2X6X45X4    |
| 442505 | 1412HPA 2X6X45X6    |
| 445348 | 1412HPA 2.5X8X45X4  |
| 445733 | 1412HPA 2.5X8X45X6  |
| 445368 | 1412HPA 3X8X45X4    |
| 445734 | 1412HPA 3X8X45X6    |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter | 1412HPA   |                               |                               |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|-----------|-------------------------------|-------------------------------|
|                                     |                                    |                                      |                                    | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |           |                               | €                             |
| 3.5                                 | 45                                 | 8                                    | 4                                  | 445349    | 1412HPA 3.5X8X45X4            |                               |
| 4                                   | 45                                 | 10                                   | 4                                  | 445350    | 1412HPA 4X10X45X4             |                               |
| 4                                   | 45                                 | 10                                   | 6                                  | 445735    | 1412HPA 4X10X45X6             |                               |
| 4.5                                 | 45                                 | 10                                   | 6                                  | 445351    | 1412HPA 4.5X10X45X6           |                               |
| 5                                   | 50                                 | 13                                   | 6                                  | 445352    | 1412HPA 5X13X50X6             |                               |
| 5.5                                 | 50                                 | 13                                   | 6                                  | 445353    | 1412HPA 5.5X13X50X6           |                               |
| 6                                   | 50                                 | 15                                   | 6                                  | 440825    | 1412HPA 6X15X50X6             |                               |
| 6.5                                 | 60                                 | 15                                   | 8                                  | 445354    | 1412HPA 6.5X15X60X8           |                               |
| 7                                   | 60                                 | 16                                   | 8                                  | 445355    | 1412HPA 7X16X60X8             |                               |
| 7.5                                 | 60                                 | 16                                   | 8                                  | 445356    | 1412HPA 7.5X16X60X8           |                               |
| 8                                   | 60                                 | 19                                   | 8                                  | 445357    | 1412HPA 8X19X60X8             |                               |
| 8.5                                 | 70                                 | 19                                   | 10                                 | 445358    | 1412HPA 8.5X19X70X10          |                               |
| 9                                   | 70                                 | 19                                   | 10                                 | 445359    | 1412HPA 9X19X70X10            |                               |
| 9.5                                 | 70                                 | 19                                   | 10                                 | 445360    | 1412HPA 9.5X19X70X10          |                               |
| 10                                  | 70                                 | 22                                   | 10                                 | 445361    | 1412HPA 10X22X70X10           |                               |
| 10.5                                | 75                                 | 22                                   | 12                                 | 445363    | 1412HPA 10.5X22X75X12         |                               |
| 11                                  | 75                                 | 22                                   | 12                                 | 445364    | 1412HPA 11X22X75X12           |                               |
| 12                                  | 75                                 | 26                                   | 12                                 | 445365    | 1412HPA 12X26X75X12           |                               |
| 14                                  | 80                                 | 26                                   | 14                                 | 445366    | 1412HPA 14X26X80X14           |                               |
| 16                                  | 100                                | 35                                   | 16                                 | 445367    | 1412HPA 16X35X100X16          |                               |
| 20                                  | 100                                | 40                                   | 20                                 | 445736    | 1412HPA 20X40X100X20          |                               |

Frese a testa piana in metallo duro integrale micrograna.  
Square end mills in solid carbide micro grain.

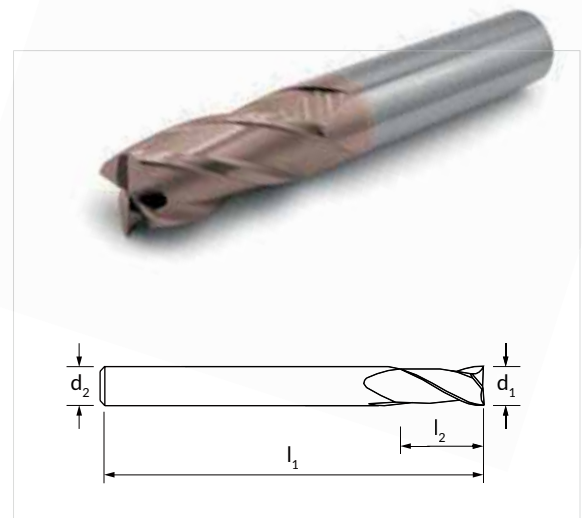
|  |  |   |  |   |
|--|--|---|--|---|
|  |  |   |  | - |
|  |  | - |  |   |

## Operazioni di fresatura | Milling strategies:

|  |  |   |   |   |   |
|--|--|---|---|---|---|
|  |  | - | - | - | - |
|--|--|---|---|---|---|

## Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |                                                          |
|---|---|---|---|---|---|----------------------------------------------------------|
|   |   |   |   |   |   | ● Raccomandato - Most suitable<br>○ Possibile - Possible |



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø      | Raggio   Radius |
|------------------------------|-----------------|
| d≤6: 0/-0.01   d>6: 0/-0.015 | -               |

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |
| 1                                   | 45                                 | 2.5                                  | 4                                  |
| 1                                   | 45                                 | 2.5                                  | 6                                  |
| 1.5                                 | 45                                 | 4                                    | 4                                  |
| 1.5                                 | 45                                 | 4                                    | 6                                  |
| 2                                   | 45                                 | 6                                    | 4                                  |
| 2                                   | 45                                 | 6                                    | 6                                  |
| 2.5                                 | 45                                 | 8                                    | 4                                  |
| 2.5                                 | 45                                 | 8                                    | 6                                  |
| 3                                   | 45                                 | 8                                    | 4                                  |
| 3                                   | 45                                 | 8                                    | 6                                  |
| 3.5                                 | 45                                 | 8                                    | 4                                  |
| 4                                   | 45                                 | 10                                   | 4                                  |
| 4                                   | 45                                 | 10                                   | 6                                  |
| 4.5                                 | 45                                 | 10                                   | 6                                  |
| 5                                   | 50                                 | 13                                   | 6                                  |
| 5.5                                 | 50                                 | 13                                   | 6                                  |
| 6                                   | 50                                 | 15                                   | 6                                  |
| 6.5                                 | 50                                 | 15                                   | 8                                  |

| 1414HPA   |                               |                               |
|-----------|-------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
|           |                               | €                             |
| 441445    | 1414HPA 1X2.5X45X4            |                               |
| 442286    | 1414HPA 1X2.5X45X6            |                               |
| 441446    | 1414HPA 1.5X4X45X4            |                               |
| 442287    | 1414HPA 1.5X4X45X6            |                               |
| 441447    | 1414HPA 2X6X45X4              |                               |
| 442288    | 1414HPA 2X6X45X6              |                               |
| 441448    | 1414HPA 2.5X8X45X4            |                               |
| 442289    | 1414HPA 2.5X8X45X6            |                               |
| 442290    | 1414HPA 3X8X45X4              |                               |
| 442291    | 1414HPA 3X8X45X6              |                               |
| 442292    | 1414HPA 3.5X8X45X4            |                               |
| 440031    | 1414HPA 4X10X45X4             |                               |
| 442293    | 1414HPA 4X10X45X6             |                               |
| 442294    | 1414HPA 4.5X10X45X6           |                               |
| 442295    | 1414HPA 5X13X50X6             |                               |
| 442296    | 1414HPA 5.5X13X50X6           |                               |
| 442297    | 1414HPA 6X15X50X6             |                               |
| 442298    | 1414HPA 6.5X15X50X8           |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter | 1414HPA   |                               |                               |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|-----------|-------------------------------|-------------------------------|
|                                     |                                    |                                      |                                    | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |           |                               | €                             |
| 7                                   | 60                                 | 16                                   | 8                                  | 442299    | 1414HPA 7X16X60X8             |                               |
| 7.5                                 | 60                                 | 16                                   | 8                                  | 442300    | 1414HPA 7.5X16X60X8           |                               |
| 8                                   | 60                                 | 19                                   | 8                                  | 442301    | 1414HPA 8X19X60X8             |                               |
| 8.5                                 | 70                                 | 19                                   | 10                                 | 442302    | 1414HPA 8.5X19X70X10          |                               |
| 9                                   | 70                                 | 19                                   | 10                                 | 442303    | 1414HPA 9X19X70X10            |                               |
| 10                                  | 70                                 | 22                                   | 10                                 | 442304    | 1414HPA 10X22X70X10           |                               |
| 10.5                                | 75                                 | 22                                   | 12                                 | 442305    | 1414HPA 10.5X22X75X12         |                               |
| 12                                  | 75                                 | 26                                   | 12                                 | 442306    | 1414HPA 12X26X75X12           |                               |
| 14                                  | 80                                 | 26                                   | 14                                 | 442307    | 1414HPA 14X26X80X14           |                               |
| 16                                  | 100                                | 35                                   | 16                                 | 442308    | 1414HPA 16X35X100X16          |                               |
| 20                                  | 100                                | 40                                   | 20                                 | 442309    | 1414HPA 20X40X100X20          |                               |

Frese a testa piana in metallo duro integrale micrograna.  
Square end mills in solid carbide micro grain.

|  |  |   |  |   |
|--|--|---|--|---|
|  |  |   |  | - |
|  |  | - |  |   |

## Operazioni di fresatura | Milling strategies:

|  |  |   |   |   |   |
|--|--|---|---|---|---|
|  |  | - | - | - | - |
|--|--|---|---|---|---|

## Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |                                |
|---|---|---|---|---|---|--------------------------------|
|   |   |   |   |   |   | ● Raccomandato - Most suitable |
|   |   |   |   |   |   | ○ Possibile - Possible         |



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø      | Raggio   Radius |
|------------------------------|-----------------|
| d≤6: 0/-0.01   d>6: 0/-0.015 | -               |

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |
| 6                                   | 50                                 | 15                                   | 6                                  |
| 6                                   | 60                                 | 20                                   | 6                                  |
| 6                                   | 65                                 | 25                                   | 6                                  |
| 6                                   | 70                                 | 30                                   | 6                                  |
| 8                                   | 65                                 | 25                                   | 8                                  |
| 8                                   | 70                                 | 30                                   | 8                                  |
| 8                                   | 90                                 | 35                                   | 8                                  |
| 8                                   | 90                                 | 40                                   | 8                                  |
| 10                                  | 80                                 | 35                                   | 10                                 |
| 10                                  | 100                                | 45                                   | 10                                 |
| 10                                  | 110                                | 55                                   | 10                                 |
| 12                                  | 90                                 | 40                                   | 12                                 |
| 12                                  | 100                                | 50                                   | 12                                 |
| 12                                  | 105                                | 60                                   | 12                                 |
| 16                                  | 100                                | 45                                   | 16                                 |
| 16                                  | 105                                | 50                                   | 16                                 |
| 16                                  | 150                                | 80                                   | 16                                 |
| 20                                  | 105                                | 50                                   | 20                                 |

| 1360HPA   |                               |                               |
|-----------|-------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
|           |                               | €                             |
| 438641    | 1360HPA 6X15X50X6             |                               |
| 437439    | 1360HPA 6X20X60X6             |                               |
| 438642    | 1360HPA 6X25X65X6             |                               |
| 438643    | 1360HPA 6X30X70X6             |                               |
| 438644    | 1360HPA 8X25X65X8             |                               |
| 437440    | 1360HPA 8X30X70X8             |                               |
| 438645    | 1360HPA 8X35X90X8             |                               |
| 438646    | 1360HPA 8X40X90X8             |                               |
| 437441    | 1360HPA 10X35X80X10           |                               |
| 438647    | 1360HPA 10X45X100X10          |                               |
| 438648    | 1360HPA 10X55X110X10          |                               |
| 438649    | 1360HPA 12X40X90X12           |                               |
| 437442    | 1360HPA 12X50X100X12          |                               |
| 438650    | 1360HPA 12X60X105X12          |                               |
| 438651    | 1360HPA 16X45X100X16          |                               |
| 437443    | 1360HPA 16X50X105X16          |                               |
| 438652    | 1360HPA 16X80X150X16          |                               |
| 437444    | 1360HPA 20X50X105X20          |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter | 1360HPA   |                               |                               |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|-----------|-------------------------------|-------------------------------|
|                                     |                                    |                                      |                                    | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |           |                               | €                             |
| 20                                  | 150                                | 80                                   | 20                                 | 437764    | 1360HPA 20X80X150X20          |                               |
| 20                                  | 160                                | 100                                  | 20                                 | 438653    | 1360HPA 20X100X160X20         |                               |

**Frese a testa piana con scarico in metallo duro integrale micrograna.**  
Square end mills long neck in solid carbide micro grain.

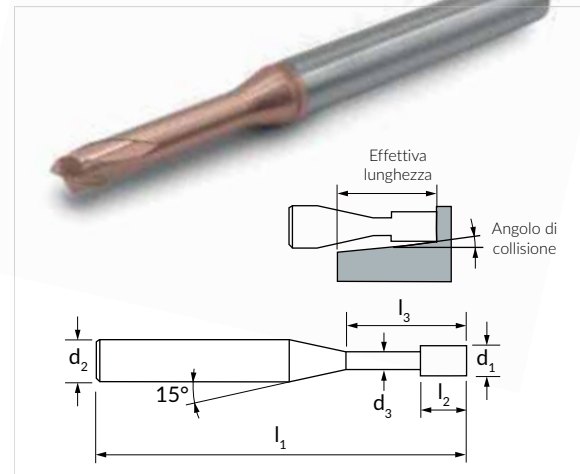
|  |  |   |  |   |
|--|--|---|--|---|
|  |  |   |  | - |
|  |  | - |  |   |

## Operazioni di fresatura | Milling strategies:

|  |  |   |   |   |   |
|--|--|---|---|---|---|
|  |  | - | - | - | - |
|--|--|---|---|---|---|

## Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |                                                          |
|---|---|---|---|---|---|----------------------------------------------------------|
|   |   |   |   |   |   | ● Raccomandato - Most suitable<br>○ Possibile - Possible |



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø      | Raggio   Radius |
|------------------------------|-----------------|
| d≤6: 0/-0.01   d>6: 0/-0.015 | -               |

| 1430HPA                             |                                    |                                      |                                    |                                    |                                 |                                                                                                                                                            |      |       |      |      | 1430HPA   |                               |                               |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|------|------|-----------|-------------------------------|-------------------------------|
| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |      |       |      |      | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30°                                                                                                                                                        | 1°   | 1°30' | 2°   | 3°   |           |                               | €                             |
| 0.1                                 | 45                                 | 0.15                                 | 0.30                               | 4                                  | 0.085                           | 0.33                                                                                                                                                       | 0.35 | 0.36  | 0.37 | 0.40 | 445717    | 1430HPA .1X.3X45X4            |                               |
| 0.1                                 | 45                                 | 0.15                                 | 0.50                               | 4                                  | 0.085                           | 0.54                                                                                                                                                       | 0.56 | 0.58  | 0.60 | 0.65 | 445718    | 1430HPA .1X.5X45X4            |                               |
| 0.1                                 | 45                                 | 0.15                                 | 1.00                               | 4                                  | 0.085                           | 1.06                                                                                                                                                       | 1.09 | 1.13  | 1.18 | 1.27 | 445719    | 1430HPA .1X1X45X4             |                               |
| 0.15                                | 45                                 | 0.20                                 | 0.30                               | 4                                  | 0.13                            | 0.34                                                                                                                                                       | 0.36 | 0.37  | 0.38 | 0.41 | 445720    | 1430HPA .15X.3X45X4           |                               |
| 0.15                                | 45                                 | 0.20                                 | 0.50                               | 4                                  | 0.13                            | 0.55                                                                                                                                                       | 0.57 | 0.59  | 0.61 | 0.66 | 445782    | 1430HPA .15X.5X45X4           |                               |
| 0.15                                | 45                                 | 0.20                                 | 1.00                               | 4                                  | 0.13                            | 1.07                                                                                                                                                       | 1.10 | 1.14  | 1.19 | 1.28 | 445783    | 1430HPA .15X1X45X4            |                               |
| 0.2                                 | 45                                 | 0.30                                 | 0.50                               | 4                                  | 0.18                            | 0.55                                                                                                                                                       | 0.57 | 0.59  | 0.61 | 0.66 | 445721    | 1430HPA .2X.5X45X4            |                               |
| 0.2                                 | 45                                 | 0.30                                 | 1.00                               | 4                                  | 0.18                            | 1.07                                                                                                                                                       | 1.10 | 1.14  | 1.19 | 1.28 | 445722    | 1430HPA .2X1X45X4             |                               |
| 0.2                                 | 45                                 | 0.30                                 | 1.50                               | 4                                  | 0.18                            | 1.58                                                                                                                                                       | 1.64 | 1.70  | 1.76 | 1.91 | 445784    | 1430HPA .2X1.5X45X4           |                               |
| 0.2                                 | 45                                 | 0.30                                 | 2.00                               | 4                                  | 0.18                            | 2.10                                                                                                                                                       | 2.17 | 2.25  | 2.34 | 2.53 | 445785    | 1430HPA .2X2X45X4             |                               |
| 0.2                                 | 45                                 | 0.30                                 | 3.00                               | 4                                  | 0.18                            | 3.13                                                                                                                                                       | 3.24 | 3.36  | 3.49 | 3.77 | 445786    | 1430HPA .2X3X45X4             |                               |
| 0.2                                 | 45                                 | 0.30                                 | 4.00                               | 4                                  | 0.18                            | 4.17                                                                                                                                                       | 4.31 | 4.47  | 4.64 | 5.01 | 445787    | 1430HPA .2X4X45X4             |                               |
| 0.3                                 | 45                                 | 0.40                                 | 1.00                               | 4                                  | 0.28                            | 1.07                                                                                                                                                       | 1.10 | 1.14  | 1.19 | 1.28 | 445788    | 1430HPA .3X1X45X4             |                               |
| 0.3                                 | 45                                 | 0.40                                 | 1.50                               | 4                                  | 0.28                            | 1.58                                                                                                                                                       | 1.64 | 1.70  | 1.76 | 1.91 | 445789    | 1430HPA .3X1.5X45X4           |                               |
| 0.3                                 | 45                                 | 0.40                                 | 2.00                               | 4                                  | 0.28                            | 2.10                                                                                                                                                       | 2.17 | 2.25  | 2.34 | 2.53 | 445790    | 1430HPA .3X2X45X4             |                               |
| 0.3                                 | 45                                 | 0.40                                 | 3.00                               | 4                                  | 0.28                            | 3.13                                                                                                                                                       | 3.24 | 3.36  | 3.49 | 3.77 | 445791    | 1430HPA .3X3X45X4             |                               |
| 0.3                                 | 45                                 | 0.40                                 | 4.00                               | 4                                  | 0.28                            | 4.17                                                                                                                                                       | 4.31 | 4.47  | 4.64 | 5.01 | 445792    | 1430HPA .3X4X45X4             |                               |
| 0.3                                 | 45                                 | 0.40                                 | 6.00                               | 4                                  | 0.28                            | 6.24                                                                                                                                                       | 6.45 | 6.69  | 6.94 | 7.50 | 445793    | 1430HPA .3X6X45X4             |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

|                                     |                                    |                                      |                                    |                                    |                                 |                                                                                                                                                            |       |       |       |       | 1430HPA   |                               |                               |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-----------|-------------------------------|-------------------------------|
| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |       |       |       | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30'                                                                                                                                                        | 1°    | 1°30' | 2°    | 3°    |           |                               | €                             |
| 0.3                                 | 45                                 | 0.40                                 | 8.00                               | 4                                  | 0.28                            | 8.30                                                                                                                                                       | 8.59  | 8.90  | 9.24  | 9.99  | 445794    | 1430HPA .3X8X45X4             |                               |
| 0.4                                 | 45                                 | 0.60                                 | 1.00                               | 4                                  | 0.37                            | 1.09                                                                                                                                                       | 1.12  | 1.17  | 1.21  | 1.31  | 445795    | 1430HPA .4X1X45X4             |                               |
| 0.4                                 | 45                                 | 0.60                                 | 1.50                               | 4                                  | 0.37                            | 1.60                                                                                                                                                       | 1.66  | 1.72  | 1.78  | 1.93  | 445796    | 1430HPA .4X1.5X45X4           |                               |
| 0.4                                 | 45                                 | 0.60                                 | 2.00                               | 4                                  | 0.37                            | 2.12                                                                                                                                                       | 2.19  | 2.27  | 2.36  | 2.55  | 445797    | 1430HPA .4X2X45X4             |                               |
| 0.4                                 | 45                                 | 0.60                                 | 2.50                               | 4                                  | 0.37                            | 2.64                                                                                                                                                       | 2.73  | 2.83  | 2.93  | 3.17  | 445798    | 1430HPA .4X2.5X45X4           |                               |
| 0.4                                 | 45                                 | 0.60                                 | 3.00                               | 4                                  | 0.37                            | 3.15                                                                                                                                                       | 3.26  | 3.38  | 3.51  | 3.79  | 445799    | 1430HPA .4X3X45X4             |                               |
| 0.4                                 | 45                                 | 0.60                                 | 3.50                               | 4                                  | 0.37                            | 3.67                                                                                                                                                       | 3.80  | 3.94  | 4.08  | 4.42  | 445800    | 1430HPA .4X3.5X45X4           |                               |
| 0.4                                 | 45                                 | 0.60                                 | 4.00                               | 4                                  | 0.37                            | 4.19                                                                                                                                                       | 4.33  | 4.49  | 4.66  | 5.04  | 445801    | 1430HPA .4X4X45X4             |                               |
| 0.4                                 | 45                                 | 0.60                                 | 5.00                               | 4                                  | 0.37                            | 5.22                                                                                                                                                       | 5.40  | 5.60  | 5.81  | 6.28  | 445802    | 1430HPA .4X5X45X4             |                               |
| 0.4                                 | 45                                 | 0.60                                 | 6.00                               | 4                                  | 0.37                            | 6.25                                                                                                                                                       | 6.47  | 6.71  | 6.96  | 7.52  | 445803    | 1430HPA .4X6X45X4             |                               |
| 0.4                                 | 45                                 | 0.60                                 | 8.00                               | 4                                  | 0.37                            | 8.32                                                                                                                                                       | 8.61  | 8.92  | 9.26  | 10.01 | 445804    | 1430HPA .4X8X45X4             |                               |
| 0.4                                 | 45                                 | 0.60                                 | 10.00                              | 4                                  | 0.37                            | 10.39                                                                                                                                                      | 10.75 | 11.14 | 11.56 | 12.50 | 445805    | 1430HPA .4X10X45X4            |                               |
| 0.4                                 | 45                                 | 0.60                                 | 12.00                              | 4                                  | 0.37                            | 12.46                                                                                                                                                      | 12.89 | 13.36 | 13.86 | 14.98 | 445806    | 1430HPA .4X12X45X4            |                               |
| 0.5                                 | 45                                 | 0.70                                 | 1.00                               | 4                                  | 0.47                            | 1.09                                                                                                                                                       | 1.12  | 1.17  | 1.21  | 1.31  | 445807    | 1430HPA .5X1X45X4             |                               |
| 0.5                                 | 45                                 | 0.70                                 | 1.50                               | 4                                  | 0.47                            | 1.60                                                                                                                                                       | 1.66  | 1.72  | 1.78  | 1.93  | 445808    | 1430HPA .5X1.5X45X4           |                               |
| 0.5                                 | 45                                 | 0.70                                 | 2.00                               | 4                                  | 0.47                            | 2.12                                                                                                                                                       | 2.19  | 2.27  | 2.36  | 2.55  | 445809    | 1430HPA .5X2X45X4             |                               |
| 0.5                                 | 45                                 | 0.70                                 | 2.50                               | 4                                  | 0.47                            | 2.64                                                                                                                                                       | 2.73  | 2.83  | 2.93  | 3.17  | 445810    | 1430HPA .5X2.5X45X4           |                               |
| 0.5                                 | 45                                 | 0.70                                 | 3.00                               | 4                                  | 0.47                            | 3.15                                                                                                                                                       | 3.26  | 3.38  | 3.51  | 3.79  | 445811    | 1430HPA .5X3X45X4             |                               |
| 0.5                                 | 45                                 | 0.70                                 | 3.50                               | 4                                  | 0.47                            | 3.67                                                                                                                                                       | 3.80  | 3.94  | 4.08  | 4.42  | 445812    | 1430HPA .5X3.5X45X4           |                               |
| 0.5                                 | 45                                 | 0.70                                 | 4.00                               | 4                                  | 0.47                            | 4.19                                                                                                                                                       | 4.33  | 4.49  | 4.66  | 5.04  | 445813    | 1430HPA .5X4X45X4             |                               |
| 0.5                                 | 45                                 | 0.70                                 | 5.00                               | 4                                  | 0.47                            | 5.22                                                                                                                                                       | 5.40  | 5.60  | 5.81  | 6.28  | 445814    | 1430HPA .5X5X45X4             |                               |
| 0.5                                 | 45                                 | 0.70                                 | 6.00                               | 4                                  | 0.47                            | 6.25                                                                                                                                                       | 6.47  | 6.71  | 6.96  | 7.52  | 445815    | 1430HPA .5X6X45X4             |                               |
| 0.5                                 | 45                                 | 0.70                                 | 8.00                               | 4                                  | 0.47                            | 8.32                                                                                                                                                       | 8.61  | 8.92  | 9.26  | 10.01 | 445816    | 1430HPA .5X8X45X4             |                               |
| 0.5                                 | 45                                 | 0.70                                 | 10.00                              | 4                                  | 0.47                            | 10.39                                                                                                                                                      | 10.75 | 11.14 | 11.56 | 12.50 | 445817    | 1430HPA .5X10X45X4            |                               |
| 0.5                                 | 45                                 | 0.70                                 | 12.00                              | 4                                  | 0.47                            | 12.46                                                                                                                                                      | 12.89 | 13.36 | 13.86 | 14.98 | 445818    | 1430HPA .5X12X45X4            |                               |
| 0.6                                 | 45                                 | 0.70                                 | 1.50                               | 4                                  | 0.57                            | 1.60                                                                                                                                                       | 1.66  | 1.72  | 1.78  | 1.93  | 445819    | 1430HPA .6X1.5X45X4           |                               |
| 0.6                                 | 45                                 | 0.70                                 | 2.00                               | 4                                  | 0.57                            | 2.12                                                                                                                                                       | 2.19  | 2.27  | 2.36  | 2.55  | 445820    | 1430HPA .6X2X45X4             |                               |
| 0.6                                 | 45                                 | 0.70                                 | 3.00                               | 4                                  | 0.57                            | 3.15                                                                                                                                                       | 3.26  | 3.38  | 3.51  | 3.79  | 445821    | 1430HPA .6X3X45X4             |                               |
| 0.6                                 | 45                                 | 0.70                                 | 4.00                               | 4                                  | 0.57                            | 4.19                                                                                                                                                       | 4.33  | 4.49  | 4.66  | 5.04  | 445822    | 1430HPA .6X4X45X4             |                               |
| 0.6                                 | 45                                 | 0.70                                 | 5.00                               | 4                                  | 0.57                            | 5.22                                                                                                                                                       | 5.40  | 5.60  | 5.81  | 6.28  | 445823    | 1430HPA .6X5X45X4             |                               |
| 0.6                                 | 45                                 | 0.70                                 | 6.00                               | 4                                  | 0.57                            | 6.25                                                                                                                                                       | 6.47  | 6.71  | 6.96  | 7.52  | 445824    | 1430HPA .6X6X45X4             |                               |
| 0.6                                 | 45                                 | 0.70                                 | 8.00                               | 4                                  | 0.57                            | 8.32                                                                                                                                                       | 8.61  | 8.92  | 9.26  | 10.01 | 445825    | 1430HPA .6X8X45X4             |                               |
| 0.6                                 | 45                                 | 0.70                                 | 10.00                              | 4                                  | 0.57                            | 10.39                                                                                                                                                      | 10.75 | 11.14 | 11.56 | 12.50 | 445826    | 1430HPA .6X10X45X4            |                               |
| 0.6                                 | 45                                 | 0.70                                 | 12.00                              | 4                                  | 0.57                            | 12.46                                                                                                                                                      | 12.89 | 13.36 | 13.86 | 14.98 | 445827    | 1430HPA .6X12X45X4            |                               |
| 0.6                                 | 50                                 | 0.70                                 | 16.00                              | 4                                  | 0.57                            | 16.59                                                                                                                                                      | 17.17 | 17.79 | 18.46 | 19.95 | 445828    | 1430HPA .6X16X50X4            |                               |
| 0.7                                 | 45                                 | 0.80                                 | 2.00                               | 4                                  | 0.66                            | 2.14                                                                                                                                                       | 2.21  | 2.29  | 2.38  | 2.57  | 445829    | 1430HPA .7X2X45X4             |                               |
| 0.7                                 | 45                                 | 0.80                                 | 3.00                               | 4                                  | 0.66                            | 3.17                                                                                                                                                       | 3.28  | 3.40  | 3.53  | 3.82  | 445830    | 1430HPA .7X3X45X4             |                               |
| 0.7                                 | 45                                 | 0.80                                 | 4.00                               | 4                                  | 0.66                            | 4.21                                                                                                                                                       | 4.35  | 4.51  | 4.68  | 5.06  | 445831    | 1430HPA .7X4X45X4             |                               |
| 0.7                                 | 45                                 | 0.80                                 | 6.00                               | 4                                  | 0.66                            | 6.27                                                                                                                                                       | 6.49  | 6.73  | 6.98  | 7.55  | 445832    | 1430HPA .7X6X45X4             |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

Per Acciai Temprati ≤55 HRC  
For Hardened Steels ≤55 HRC

Frese a testa piana con scarico in metallo duro integrale micrograna.  
Square end mills long neck in solid carbide micro grain.

| 1430HPA                             |                                    |                                      |                                    |                                    |                                 |                                                                                                                                                            |       |       |       |        | 1430HPA   |                               |                               |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|--------|-----------|-------------------------------|-------------------------------|
| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |       |       |        | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30'                                                                                                                                                        | 1°    | 1°30' | 2°    | 3°     |           |                               | €                             |
| 0.7                                 | 45                                 | 0.80                                 | 8.00                               | 4                                  | 0.66                            | 8.34                                                                                                                                                       | 8.63  | 8.94  | 9.28  | 10.03  | 445833    | 1430HPA .7X8X45X4             |                               |
| 0.7                                 | 45                                 | 0.80                                 | 10.00                              | 4                                  | 0.66                            | 10.41                                                                                                                                                      | 10.77 | 11.16 | 11.58 | 12.52  | 445834    | 1430HPA .7X10X45X4            |                               |
| 0.8                                 | 45                                 | 1.00                                 | 2.00                               | 4                                  | 0.77                            | 2.12                                                                                                                                                       | 2.19  | 2.27  | 2.36  | 2.55   | 445835    | 1430HPA .8X2X45X4             |                               |
| 0.8                                 | 45                                 | 1.00                                 | 3.00                               | 4                                  | 0.77                            | 3.15                                                                                                                                                       | 3.26  | 3.38  | 3.51  | 3.79   | 445836    | 1430HPA .8X3X45X4             |                               |
| 0.8                                 | 45                                 | 1.00                                 | 4.00                               | 4                                  | 0.77                            | 4.19                                                                                                                                                       | 4.33  | 4.49  | 4.66  | 5.04   | 445837    | 1430HPA .8X4X45X4             |                               |
| 0.8                                 | 45                                 | 1.00                                 | 5.00                               | 4                                  | 0.77                            | 5.22                                                                                                                                                       | 5.40  | 5.60  | 5.81  | 6.28   | 445838    | 1430HPA .8X5X45X4             |                               |
| 0.8                                 | 45                                 | 1.00                                 | 6.00                               | 4                                  | 0.77                            | 6.25                                                                                                                                                       | 6.47  | 6.71  | 6.96  | 7.52   | 445839    | 1430HPA .8X6X45X4             |                               |
| 0.8                                 | 45                                 | 1.00                                 | 8.00                               | 4                                  | 0.77                            | 8.32                                                                                                                                                       | 8.61  | 8.92  | 9.26  | 10.01  | 445840    | 1430HPA .8X8X45X4             |                               |
| 0.8                                 | 45                                 | 1.00                                 | 10.00                              | 4                                  | 0.77                            | 10.39                                                                                                                                                      | 10.75 | 11.14 | 11.56 | 12.50  | 445841    | 1430HPA .8X10X45X4            |                               |
| 0.8                                 | 45                                 | 1.00                                 | 12.00                              | 4                                  | 0.77                            | 12.46                                                                                                                                                      | 12.89 | 13.36 | 13.86 | 14.98  | 445842    | 1430HPA .8X12X45X4            |                               |
| 0.8                                 | 50                                 | 1.00                                 | 16.00                              | 4                                  | 0.77                            | 16.59                                                                                                                                                      | 17.17 | 17.79 | 18.46 | 19.95  | 445843    | 1430HPA .8X16X50X4            |                               |
| 0.8                                 | 50                                 | 1.00                                 | 20.00                              | 4                                  | 0.77                            | 20.73                                                                                                                                                      | 21.45 | 22.22 | 23.06 | 24.93  | 445844    | 1430HPA .8X20X50X4            |                               |
| 0.8                                 | 60                                 | 1.00                                 | 25.00                              | 4                                  | 0.77                            | 25.89                                                                                                                                                      | 26.80 | 27.76 | 28.81 | Libero | 445845    | 1430HPA .8X25X60X4            |                               |
| 0.9                                 | 45                                 | 1.10                                 | 2.00                               | 4                                  | 0.85                            | 2.16                                                                                                                                                       | 2.23  | 2.32  | 2.40  | 2.60   | 445846    | 1430HPA .9X2X45X4             |                               |
| 0.9                                 | 45                                 | 1.10                                 | 4.00                               | 4                                  | 0.85                            | 4.23                                                                                                                                                       | 4.37  | 4.53  | 4.70  | 5.08   | 445847    | 1430HPA .9X4X45X4             |                               |
| 0.9                                 | 45                                 | 1.10                                 | 6.00                               | 4                                  | 0.85                            | 6.29                                                                                                                                                       | 6.51  | 6.75  | 7.00  | 7.57   | 445848    | 1430HPA .9X6X45X4             |                               |
| 0.9                                 | 45                                 | 1.10                                 | 8.00                               | 4                                  | 0.85                            | 8.36                                                                                                                                                       | 8.65  | 8.96  | 9.30  | 10.06  | 445849    | 1430HPA .9X8X45X4             |                               |
| 0.9                                 | 45                                 | 1.10                                 | 10.00                              | 4                                  | 0.85                            | 10.43                                                                                                                                                      | 10.79 | 11.18 | 11.60 | 12.54  | 445850    | 1430HPA .9X10X45X4            |                               |
| 1.0                                 | 45                                 | 1.20                                 | 2.00                               | 4                                  | 0.95                            | 2.16                                                                                                                                                       | 2.23  | 2.32  | 2.40  | 2.60   | 445851    | 1430HPA 1X2X45X4              |                               |
| 1.0                                 | 45                                 | 1.20                                 | 3.00                               | 4                                  | 0.95                            | 3.19                                                                                                                                                       | 3.30  | 3.42  | 3.55  | 3.84   | 445852    | 1430HPA 1X3X45X4              |                               |
| 1.0                                 | 45                                 | 1.20                                 | 4.00                               | 4                                  | 0.95                            | 4.23                                                                                                                                                       | 4.37  | 4.53  | 4.70  | 5.08   | 445853    | 1430HPA 1X4X45X4              |                               |
| 1.0                                 | 45                                 | 1.20                                 | 5.00                               | 4                                  | 0.95                            | 5.26                                                                                                                                                       | 5.44  | 5.64  | 5.85  | 6.33   | 445854    | 1430HPA 1X5X45X4              |                               |
| 1.0                                 | 45                                 | 1.20                                 | 6.00                               | 4                                  | 0.95                            | 6.29                                                                                                                                                       | 6.51  | 6.75  | 7.00  | 7.57   | 445855    | 1430HPA 1X6X45X4              |                               |
| 1.0                                 | 45                                 | 1.20                                 | 8.00                               | 4                                  | 0.95                            | 8.36                                                                                                                                                       | 8.65  | 8.96  | 9.30  | 10.06  | 445856    | 1430HPA 1X8X45X4              |                               |
| 1.0                                 | 45                                 | 1.20                                 | 10.00                              | 4                                  | 0.95                            | 10.43                                                                                                                                                      | 10.79 | 11.18 | 11.60 | 12.54  | 445857    | 1430HPA 1X10X45X4             |                               |
| 1.0                                 | 45                                 | 1.20                                 | 12.00                              | 4                                  | 0.95                            | 12.50                                                                                                                                                      | 12.93 | 13.40 | 13.90 | 15.03  | 445858    | 1430HPA 1X12X45X4             |                               |
| 1.0                                 | 45                                 | 1.20                                 | 14.00                              | 4                                  | 0.95                            | 14.56                                                                                                                                                      | 15.07 | 15.61 | 16.20 | 17.52  | 445859    | 1430HPA 1X14X45X4             |                               |
| 1.0                                 | 50                                 | 1.20                                 | 16.00                              | 4                                  | 0.95                            | 16.63                                                                                                                                                      | 17.21 | 17.83 | 18.50 | 20.00  | 445860    | 1430HPA 1X16X50X4             |                               |
| 1.0                                 | 50                                 | 1.20                                 | 18.00                              | 4                                  | 0.95                            | 18.70                                                                                                                                                      | 19.35 | 20.05 | 20.80 | 22.49  | 445861    | 1430HPA 1X18X50X4             |                               |
| 1.0                                 | 50                                 | 1.20                                 | 20.00                              | 4                                  | 0.95                            | 20.76                                                                                                                                                      | 21.49 | 22.26 | 23.10 | 24.97  | 445862    | 1430HPA 1X20X50X4             |                               |
| 1.0                                 | 60                                 | 1.20                                 | 25.00                              | 4                                  | 0.95                            | 25.93                                                                                                                                                      | 26.84 | 27.81 | 28.85 | Libero | 445863    | 1430HPA 1X25X60X4             |                               |
| 1.0                                 | 70                                 | 1.20                                 | 30.00                              | 4                                  | 0.95                            | 31.10                                                                                                                                                      | 32.19 | 33.35 | 34.60 | Libero | 445864    | 1430HPA 1X30X70X4             |                               |
| 1.2                                 | 45                                 | 1.50                                 | 4.00                               | 4                                  | 1.14                            | 4.25                                                                                                                                                       | 4.39  | 4.55  | 4.72  | 5.11   | 445865    | 1430HPA 1.2X4X45X4            |                               |
| 1.2                                 | 45                                 | 1.50                                 | 6.00                               | 4                                  | 1.14                            | 6.31                                                                                                                                                       | 6.53  | 6.77  | 7.02  | 7.59   | 445866    | 1430HPA 1.2X6X45X4            |                               |
| 1.2                                 | 45                                 | 1.50                                 | 8.00                               | 4                                  | 1.14                            | 8.38                                                                                                                                                       | 8.67  | 8.99  | 9.32  | 10.08  | 445867    | 1430HPA 1.2X8X45X4            |                               |
| 1.2                                 | 45                                 | 1.50                                 | 10.00                              | 4                                  | 1.14                            | 10.45                                                                                                                                                      | 10.81 | 11.20 | 11.62 | 12.57  | 445868    | 1430HPA 1.2X10X45X4           |                               |
| 1.2                                 | 45                                 | 1.50                                 | 12.00                              | 4                                  | 1.14                            | 12.51                                                                                                                                                      | 12.95 | 13.42 | 13.92 | 15.05  | 445869    | 1430HPA 1.2X12X45X4           |                               |
| 1.2                                 | 50                                 | 1.50                                 | 16.00                              | 4                                  | 1.14                            | 16.65                                                                                                                                                      | 17.23 | 17.85 | 18.52 | 20.02  | 445870    | 1430HPA 1.2X16X50X4           |                               |
| 1.2                                 | 50                                 | 1.50                                 | 20.00                              | 4                                  | 1.14                            | 20.78                                                                                                                                                      | 21.51 | 22.29 | 23.12 | 25.00  | 445871    | 1430HPA 1.2X20X50X4           |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |        |        |        | 1430HPA   |                               |                               |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|--------|--------|-----------|-------------------------------|-------------------------------|
|                                     |                                    |                                      |                                    |                                    |                                 | 30'                                                                                                                                                        | 1°    | 1°30'  | 2°     | 3°     | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  |                                                                                                                                                            |       |        |        |        |           |                               | €                             |
| 1.2                                 | 60                                 | 1.50                                 | 25.00                              | 4                                  | 1.14                            | 25.95                                                                                                                                                      | 26.86 | 27.83  | 28.87  | Libero | 445872    | 1430HPA 1.2X25X60X4           |                               |
| 1.5                                 | 45                                 | 1.80                                 | 4.00                               | 4                                  | 1.44                            | 4.25                                                                                                                                                       | 4.39  | 4.55   | 4.72   | 5.11   | 445873    | 1430HPA 1.5X4X45X4            |                               |
| 1.5                                 | 45                                 | 1.80                                 | 6.00                               | 4                                  | 1.44                            | 6.31                                                                                                                                                       | 6.53  | 6.77   | 7.02   | 7.59   | 445874    | 1430HPA 1.5X6X45X4            |                               |
| 1.5                                 | 45                                 | 1.80                                 | 8.00                               | 4                                  | 1.44                            | 8.38                                                                                                                                                       | 8.67  | 8.99   | 9.32   | 10.08  | 445875    | 1430HPA 1.5X8X45X4            |                               |
| 1.5                                 | 45                                 | 1.80                                 | 10.00                              | 4                                  | 1.44                            | 10.45                                                                                                                                                      | 10.81 | 11.20  | 11.62  | 12.57  | 445876    | 1430HPA 1.5X10X45X4           |                               |
| 1.5                                 | 45                                 | 1.80                                 | 12.00                              | 4                                  | 1.44                            | 12.51                                                                                                                                                      | 12.95 | 13.42  | 13.92  | 15.05  | 445877    | 1430HPA 1.5X12X45X4           |                               |
| 1.5                                 | 50                                 | 1.80                                 | 16.00                              | 4                                  | 1.44                            | 16.65                                                                                                                                                      | 17.23 | 17.85  | 18.52  | 20.02  | 445878    | 1430HPA 1.5X16X50X4           |                               |
| 1.5                                 | 50                                 | 1.80                                 | 18.00                              | 4                                  | 1.44                            | 18.72                                                                                                                                                      | 19.37 | 20.07  | 20.82  | 22.51  | 445879    | 1430HPA 1.5X18X50X4           |                               |
| 1.5                                 | 50                                 | 1.80                                 | 20.00                              | 4                                  | 1.44                            | 20.78                                                                                                                                                      | 21.51 | 22.29  | 23.12  | Libero | 445880    | 1430HPA 1.5X20X50X4           |                               |
| 1.5                                 | 60                                 | 1.80                                 | 25.00                              | 4                                  | 1.44                            | 25.95                                                                                                                                                      | 26.86 | 27.83  | 28.87  | Libero | 445881    | 1430HPA 1.5X25X60X4           |                               |
| 1.5                                 | 70                                 | 1.80                                 | 30.00                              | 4                                  | 1.44                            | 31.12                                                                                                                                                      | 32.21 | 33.37  | 34.62  | Libero | 445882    | 1430HPA 1.5X30X70X4           |                               |
| 1.5                                 | 80                                 | 1.80                                 | 40.00                              | 4                                  | 1.44                            | 41.46                                                                                                                                                      | 42.90 | 44.45  | Libero | Libero | 445883    | 1430HPA 1.5X40X80X4           |                               |
| 1.6                                 | 45                                 | 2.00                                 | 8.00                               | 4                                  | 1.55                            | 8.36                                                                                                                                                       | 8.65  | 8.96   | 9.30   | 10.06  | 445884    | 1430HPA 1.6X8X45X4            |                               |
| 1.6                                 | 45                                 | 2.00                                 | 10.00                              | 4                                  | 1.55                            | 10.43                                                                                                                                                      | 10.79 | 11.18  | 11.60  | 12.54  | 445885    | 1430HPA 1.6X10X45X4           |                               |
| 1.6                                 | 45                                 | 2.00                                 | 12.00                              | 4                                  | 1.55                            | 12.50                                                                                                                                                      | 12.93 | 13.40  | 13.90  | 15.03  | 445886    | 1430HPA 1.6X12X45X4           |                               |
| 1.6                                 | 45                                 | 2.00                                 | 14.00                              | 4                                  | 1.55                            | 14.56                                                                                                                                                      | 15.07 | 15.61  | 16.20  | 17.52  | 445887    | 1430HPA 1.6X14X45X4           |                               |
| 1.6                                 | 50                                 | 2.00                                 | 16.00                              | 4                                  | 1.55                            | 16.63                                                                                                                                                      | 17.21 | 17.83  | 18.50  | 20.00  | 445888    | 1430HPA 1.6X16X50X4           |                               |
| 1.6                                 | 50                                 | 2.00                                 | 18.00                              | 4                                  | 1.55                            | 18.70                                                                                                                                                      | 19.35 | 20.05  | 20.80  | 22.49  | 445889    | 1430HPA 1.6X18X50X4           |                               |
| 1.6                                 | 50                                 | 2.00                                 | 20.00                              | 4                                  | 1.55                            | 20.76                                                                                                                                                      | 21.49 | 22.26  | 23.10  | Libero | 445890    | 1430HPA 1.6X20X50X4           |                               |
| 1.8                                 | 45                                 | 2.20                                 | 8.00                               | 4                                  | 1.75                            | 8.36                                                                                                                                                       | 8.65  | 8.96   | 9.30   | 10.06  | 445891    | 1430HPA 1.8X8X45X4            |                               |
| 1.8                                 | 45                                 | 2.20                                 | 10.00                              | 4                                  | 1.75                            | 10.43                                                                                                                                                      | 10.79 | 11.18  | 11.60  | 12.54  | 445892    | 1430HPA 1.8X10X45X4           |                               |
| 1.8                                 | 45                                 | 2.20                                 | 12.00                              | 4                                  | 1.75                            | 12.50                                                                                                                                                      | 12.93 | 13.40  | 13.90  | 15.03  | 445893    | 1430HPA 1.8X12X45X4           |                               |
| 1.8                                 | 45                                 | 2.20                                 | 14.00                              | 4                                  | 1.75                            | 14.56                                                                                                                                                      | 15.07 | 15.61  | 16.20  | 17.52  | 445894    | 1430HPA 1.8X14X45X4           |                               |
| 1.8                                 | 50                                 | 2.20                                 | 16.00                              | 4                                  | 1.75                            | 16.63                                                                                                                                                      | 17.21 | 17.83  | 18.50  | 20.00  | 445895    | 1430HPA 1.8X16X50X4           |                               |
| 1.8                                 | 50                                 | 2.20                                 | 18.00                              | 4                                  | 1.75                            | 18.70                                                                                                                                                      | 19.35 | 20.05  | 20.80  | Libero | 445896    | 1430HPA 1.8X18X50X4           |                               |
| 1.8                                 | 50                                 | 2.20                                 | 20.00                              | 4                                  | 1.75                            | 20.76                                                                                                                                                      | 21.49 | 22.26  | 23.10  | Libero | 445897    | 1430HPA 1.8X20X50X4           |                               |
| 2.0                                 | 45                                 | 2.50                                 | 4.00                               | 4                                  | 1.92                            | 4.28                                                                                                                                                       | 4.43  | 4.59   | 4.77   | 5.15   | 445898    | 1430HPA 2X4X45X4              |                               |
| 2.0                                 | 45                                 | 2.50                                 | 6.00                               | 4                                  | 1.92                            | 6.35                                                                                                                                                       | 6.57  | 6.81   | 7.07   | 7.64   | 445899    | 1430HPA 2X6X45X4              |                               |
| 2.0                                 | 45                                 | 2.50                                 | 8.00                               | 4                                  | 1.92                            | 8.42                                                                                                                                                       | 8.71  | 9.03   | 9.37   | 10.13  | 445900    | 1430HPA 2X8X45X4              |                               |
| 2.0                                 | 45                                 | 2.50                                 | 10.00                              | 4                                  | 1.92                            | 10.49                                                                                                                                                      | 10.85 | 11.24  | 11.67  | 12.61  | 445901    | 1430HPA 2X10X45X4             |                               |
| 2.0                                 | 45                                 | 2.50                                 | 12.00                              | 4                                  | 1.92                            | 12.55                                                                                                                                                      | 12.99 | 13.46  | 13.96  | 15.10  | 445902    | 1430HPA 2X12X45X4             |                               |
| 2.0                                 | 45                                 | 2.50                                 | 14.00                              | 4                                  | 1.92                            | 14.62                                                                                                                                                      | 15.13 | 15.68  | 16.26  | 17.58  | 445903    | 1430HPA 2X14X45X4             |                               |
| 2.0                                 | 50                                 | 2.50                                 | 16.00                              | 4                                  | 1.92                            | 16.69                                                                                                                                                      | 17.27 | 17.89  | 18.56  | Libero | 445904    | 1430HPA 2X16X50X4             |                               |
| 2.0                                 | 50                                 | 2.50                                 | 18.00                              | 4                                  | 1.92                            | 18.76                                                                                                                                                      | 19.41 | 20.11  | 20.86  | Libero | 445905    | 1430HPA 2X18X50X4             |                               |
| 2.0                                 | 50                                 | 2.50                                 | 20.00                              | 4                                  | 1.92                            | 20.82                                                                                                                                                      | 21.55 | 22.33  | 23.16  | Libero | 445906    | 1430HPA 2X20X50X4             |                               |
| 2.0                                 | 60                                 | 2.50                                 | 25.00                              | 4                                  | 1.92                            | 25.99                                                                                                                                                      | 26.90 | 27.87  | Libero | Libero | 445907    | 1430HPA 2X25X60X4             |                               |
| 2.0                                 | 70                                 | 2.50                                 | 30.00                              | 4                                  | 1.92                            | 31.16                                                                                                                                                      | 32.25 | 33.41  | Libero | Libero | 445908    | 1430HPA 2X30X70X4             |                               |
| 2.0                                 | 80                                 | 2.50                                 | 40.00                              | 4                                  | 1.92                            | 41.50                                                                                                                                                      | 42.94 | Libero | Libero | Libero | 445909    | 1430HPA 2X40X80X4             |                               |
| 2.5                                 | 45                                 | 3.00                                 | 10.00                              | 4                                  | 2.39                            | 10.54                                                                                                                                                      | 10.91 | 11.31  | 11.73  | 12.68  | 445910    | 1430HPA 2.5X10X45X4           |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

Per Acciai Temprati ≤55 HRC  
For Hardened Steels ≤55 HRC

Frese a testa piana con scarico in metallo duro integrale micrograna.  
Square end mills long neck in solid carbide micro grain.

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |        |        |        |        | 1430HPA   |                               |                               |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--------|--------|-----------|-------------------------------|-------------------------------|
|                                     |                                    |                                      |                                    |                                    |                                 | 30°                                                                                                                                                        | 1°     | 1°30'  | 2°     | 3°     | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  |                                                                                                                                                            |        |        |        |        |           |                               | €                             |
| 2.5                                 | 45                                 | 3.00                                 | 12.00                              | 4                                  | 2.39                            | 12.61                                                                                                                                                      | 13.05  | 13.52  | 14.03  | Libero | 445911    | 1430HPA 2.5X12X45X4           |                               |
| 2.5                                 | 50                                 | 3.00                                 | 16.00                              | 4                                  | 2.39                            | 16.75                                                                                                                                                      | 17.33  | 17.96  | 18.63  | Libero | 445912    | 1430HPA 2.5X16X50X4           |                               |
| 2.5                                 | 50                                 | 3.00                                 | 20.00                              | 4                                  | 2.39                            | 20.88                                                                                                                                                      | 21.61  | 22.39  | Libero | Libero | 445913    | 1430HPA 2.5X20X50X4           |                               |
| 2.5                                 | 60                                 | 3.00                                 | 25.00                              | 4                                  | 2.39                            | 26.05                                                                                                                                                      | 26.96  | 27.93  | Libero | Libero | 445914    | 1430HPA 2.5X25X60X4           |                               |
| 2.5                                 | 70                                 | 3.00                                 | 30.00                              | 4                                  | 2.39                            | 31.22                                                                                                                                                      | 32.31  | Libero | Libero | Libero | 445915    | 1430HPA 2.5X30X70X4           |                               |
| 3.0                                 | 50                                 | 4.00                                 | 8.00                               | 6                                  | 2.86                            | 8.53                                                                                                                                                       | 8.83   | 9.15   | 9.49   | 10.26  | 445916    | 1430HPA 3X8X50X6              |                               |
| 3.0                                 | 50                                 | 4.00                                 | 10.00                              | 6                                  | 2.86                            | 10.60                                                                                                                                                      | 10.97  | 11.37  | 11.79  | 12.75  | 445917    | 1430HPA 3X10X50X6             |                               |
| 3.0                                 | 50                                 | 4.00                                 | 12.00                              | 6                                  | 2.86                            | 12.67                                                                                                                                                      | 13.11  | 13.58  | 14.09  | 15.24  | 445918    | 1430HPA 3X12X50X6             |                               |
| 3.0                                 | 60                                 | 4.00                                 | 16.00                              | 6                                  | 2.86                            | 16.80                                                                                                                                                      | 17.39  | 18.02  | 18.69  | 20.21  | 445919    | 1430HPA 3X16X60X6             |                               |
| 3.0                                 | 60                                 | 4.00                                 | 20.00                              | 6                                  | 2.86                            | 20.94                                                                                                                                                      | 21.67  | 22.45  | 23.29  | 25.18  | 445920    | 1430HPA 3X20X60X6             |                               |
| 3.0                                 | 60                                 | 4.00                                 | 25.00                              | 6                                  | 2.86                            | 26.11                                                                                                                                                      | 27.02  | 27.99  | 29.04  | Libero | 445921    | 1430HPA 3X25X60X6             |                               |
| 3.0                                 | 70                                 | 4.00                                 | 30.00                              | 6                                  | 2.86                            | 31.28                                                                                                                                                      | 32.36  | 33.53  | 34.79  | Libero | 445922    | 1430HPA 3X30X70X6             |                               |
| 3.0                                 | 70                                 | 4.00                                 | 35.00                              | 6                                  | 2.86                            | 36.44                                                                                                                                                      | 37.71  | 39.08  | 40.54  | Libero | 445923    | 1430HPA 3X35X70X6             |                               |
| 3.0                                 | 80                                 | 4.00                                 | 40.00                              | 6                                  | 2.86                            | 41.61                                                                                                                                                      | 43.06  | 44.62  | Libero | Libero | 445924    | 1430HPA 3X40X80X6             |                               |
| 4.0                                 | 50                                 | 5.00                                 | 12.00                              | 6                                  | 3.80                            | 12.78                                                                                                                                                      | 13.23  | 13.71  | 14.22  | 15.38  | 445925    | 1430HPA 4X12X50X6             |                               |
| 4.0                                 | 50                                 | 5.00                                 | 14.00                              | 6                                  | 3.80                            | 14.85                                                                                                                                                      | 15.37  | 15.93  | 16.52  | 17.86  | 445926    | 1430HPA 4X14X50X6             |                               |
| 4.0                                 | 60                                 | 5.00                                 | 16.00                              | 6                                  | 3.80                            | 16.92                                                                                                                                                      | 17.51  | 18.14  | 18.82  | Libero | 445927    | 1430HPA 4X16X60X6             |                               |
| 4.0                                 | 60                                 | 5.00                                 | 20.00                              | 6                                  | 3.80                            | 21.05                                                                                                                                                      | 21.79  | 22.57  | 23.42  | Libero | 445928    | 1430HPA 4X20X60X6             |                               |
| 4.0                                 | 60                                 | 5.00                                 | 25.00                              | 6                                  | 3.80                            | 26.22                                                                                                                                                      | 27.14  | 28.12  | Libero | Libero | 445929    | 1430HPA 4X25X60X6             |                               |
| 4.0                                 | 70                                 | 5.00                                 | 30.00                              | 6                                  | 3.80                            | 31.39                                                                                                                                                      | 32.48  | 33.66  | Libero | Libero | 445930    | 1430HPA 4X30X70X6             |                               |
| 4.0                                 | 70                                 | 5.00                                 | 35.00                              | 6                                  | 3.80                            | 36.56                                                                                                                                                      | 37.83  | Libero | Libero | Libero | 445931    | 1430HPA 4X35X70X6             |                               |
| 4.0                                 | 80                                 | 5.00                                 | 40.00                              | 6                                  | 3.80                            | 41.73                                                                                                                                                      | 43.18  | Libero | Libero | Libero | 445932    | 1430HPA 4X40X80X6             |                               |
| 4.0                                 | 100                                | 5.00                                 | 50.00                              | 6                                  | 3.80                            | 52.06                                                                                                                                                      | 53.88  | Libero | Libero | Libero | 445933    | 1430HPA 4X50X100X6            |                               |
| 5.0                                 | 60                                 | 7.50                                 | 16.00                              | 6                                  | 4.75                            | 17.02                                                                                                                                                      | 17.61  | 18.25  | Libero | Libero | 445934    | 1430HPA 5X16X60X6             |                               |
| 5.0                                 | 60                                 | 7.50                                 | 20.00                              | 6                                  | 4.75                            | 21.15                                                                                                                                                      | 21.89  | Libero | Libero | Libero | 445935    | 1430HPA 5X20X60X6             |                               |
| 5.0                                 | 60                                 | 7.50                                 | 25.00                              | 6                                  | 4.75                            | 26.32                                                                                                                                                      | 27.24  | Libero | Libero | Libero | 445936    | 1430HPA 5X25X60X6             |                               |
| 5.0                                 | 70                                 | 7.50                                 | 30.00                              | 6                                  | 4.75                            | 31.49                                                                                                                                                      | Libero | Libero | Libero | Libero | 445937    | 1430HPA 5X30X70X6             |                               |
| 5.0                                 | 70                                 | 7.50                                 | 35.00                              | 6                                  | 4.75                            | 36.66                                                                                                                                                      | Libero | Libero | Libero | Libero | 445938    | 1430HPA 5X35X70X6             |                               |
| 5.0                                 | 80                                 | 7.50                                 | 40.00                              | 6                                  | 4.75                            | 41.82                                                                                                                                                      | Libero | Libero | Libero | Libero | 445939    | 1430HPA 5X40X80X6             |                               |
| 5.0                                 | 100                                | 7.50                                 | 50.00                              | 6                                  | 4.75                            | 52.16                                                                                                                                                      | Libero | Libero | Libero | Libero | 445940    | 1430HPA 5X50X100X6            |                               |
| 6.0                                 | 60                                 | 9.00                                 | 15.00                              | 6                                  | 5.70                            | Libero                                                                                                                                                     | Libero | Libero | Libero | Libero | 445941    | 1430HPA 6X15X60X6             |                               |
| 6.0                                 | 60                                 | 9.00                                 | 20.00                              | 6                                  | 5.70                            | Libero                                                                                                                                                     | Libero | Libero | Libero | Libero | 445942    | 1430HPA 6X20X60X6             |                               |
| 6.0                                 | 70                                 | 9.00                                 | 30.00                              | 6                                  | 5.70                            | Libero                                                                                                                                                     | Libero | Libero | Libero | Libero | 445943    | 1430HPA 6X30X70X6             |                               |
| 6.0                                 | 80                                 | 9.00                                 | 40.00                              | 6                                  | 5.70                            | Libero                                                                                                                                                     | Libero | Libero | Libero | Libero | 445944    | 1430HPA 6X40X80X6             |                               |
| 8.0                                 | 80                                 | 12.00                                | 20.00                              | 8                                  | 7.60                            | Libero                                                                                                                                                     | Libero | Libero | Libero | Libero | 445945    | 1430HPA 8X20X80X8             |                               |
| 8.0                                 | 80                                 | 12.00                                | 30.00                              | 8                                  | 7.60                            | Libero                                                                                                                                                     | Libero | Libero | Libero | Libero | 445946    | 1430HPA 8X30X80X8             |                               |
| 8.0                                 | 100                                | 12.00                                | 40.00                              | 8                                  | 7.60                            | Libero                                                                                                                                                     | Libero | Libero | Libero | Libero | 445947    | 1430HPA 8X40X100X8            |                               |

Frese a testa piana serie lunga in metallo duro integrale micrograna.  
Square end mills long series in solid carbide micro grain.

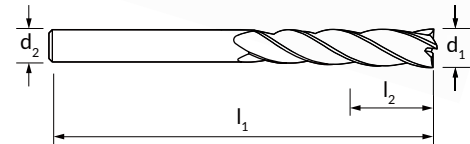
|  |  |   |  |   |
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|  |  |   |  | - |
|  |  | - |  |   |

## Operazioni di fresatura | Milling strategies:

|  |  |   |   |   |   |
|--|--|---|---|---|---|
|  |  | - | - | - | - |
|--|--|---|---|---|---|

## Gruppo materiali lavorabili | Group of working materials:

|   |   |   |   |   |   |                                |
|---|---|---|---|---|---|--------------------------------|
| P | M | K | N | S | H | ● Raccomandato - Most suitable |
| ○ | ○ | ○ | - | ○ | ○ | ○ Possibile - Possible         |



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø      | Raggio   Radius |
|------------------------------|-----------------|
| d≤6: 0/-0.01   d>6: 0/-0.015 | -               |

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |
| 2                                   | 60                                 | 10                                   | 6                                  |
| 3                                   | 70                                 | 15                                   | 6                                  |
| 3                                   | 70                                 | 20                                   | 6                                  |
| 4                                   | 70                                 | 15                                   | 6                                  |
| 4                                   | 70                                 | 20                                   | 6                                  |
| 5                                   | 70                                 | 25                                   | 6                                  |
| 6                                   | 70                                 | 20                                   | 6                                  |
| 6                                   | 80                                 | 30                                   | 6                                  |
| 8                                   | 80                                 | 30                                   | 8                                  |
| 8                                   | 90                                 | 35                                   | 8                                  |
| 8                                   | 90                                 | 40                                   | 8                                  |
| 10                                  | 90                                 | 35                                   | 10                                 |
| 10                                  | 90                                 | 40                                   | 10                                 |
| 10                                  | 100                                | 50                                   | 10                                 |
| 10                                  | 110                                | 60                                   | 10                                 |
| 12                                  | 90                                 | 30                                   | 12                                 |
| 12                                  | 100                                | 40                                   | 12                                 |
| 12                                  | 105                                | 60                                   | 12                                 |

| 1414LHPA  |                               |                               |
|-----------|-------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
|           |                               | €                             |
| 442310    | 1414LHPA 2X10X60X6            |                               |
| 442311    | 1414LHPA 3X15X70X6            |                               |
| 442312    | 1414LHPA 3X20X70X6            |                               |
| 442313    | 1414LHPA 4X15X70X6            |                               |
| 442314    | 1414LHPA 4X20X70X6            |                               |
| 442315    | 1414LHPA 5X25X70X6            |                               |
| 442316    | 1414LHPA 6X20X70X6            |                               |
| 442317    | 1414LHPA 6X30X80X6            |                               |
| 442318    | 1414LHPA 8X30X80X8            |                               |
| 442319    | 1414LHPA 8X35X90X8            |                               |
| 442320    | 1414LHPA 8X40X90X8            |                               |
| 442321    | 1414LHPA 10X35X90X10          |                               |
| 442322    | 1414LHPA 10X40X90X10          |                               |
| 442323    | 1414LHPA 10X50X100X10         |                               |
| 442324    | 1414LHPA 10X60X110X10         |                               |
| 442325    | 1414LHPA 12X30X90X12          |                               |
| 442326    | 1414LHPA 12X40X100X12         |                               |
| 442327    | 1414LHPA 12X60X105X12         |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

**Frese a testa piana serie lunga in metallo duro integrale micrograna.**  
Square end mills long series in solid carbide micro grain.

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter |  |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|--|
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |  |
| 16                                  | 105                                | 55                                   | 16                                 |  |
| 20                                  | 160                                | 80                                   | 20                                 |  |

| 1414LHPA  |                               |                                                                                     |                               |
|-----------|-------------------------------|-------------------------------------------------------------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code |  | Prezzo utensile<br>Tool Price |
|           |                               |                                                                                     | €                             |
| 442328    | 1414LHPA                      | 16X55X105X16                                                                        |                               |
| 442329    | 1414LHPA                      | 20X80X160X20                                                                        |                               |

**Frese toriche in metallo duro integrale micrograna.**  
Corner radius end mills in solid carbide micro grain.

|  |  |   |  |   |
|--|--|---|--|---|
|  |  |   |  | - |
|  |  | - |  |   |

## Operazioni di fresatura | Milling strategies:

|  |  |   |   |  |   |
|--|--|---|---|--|---|
|  |  | - | - |  | - |
|--|--|---|---|--|---|

## Gruppo materiali lavorabili | Group of working materials:

|          |          |          |          |          |          |                                |
|----------|----------|----------|----------|----------|----------|--------------------------------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> | ● Raccomandato - Most suitable |
| ○        | ○        | ○        | -        | ○        | ○        | ○ Possibile - Possible         |



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø          | Raggio   Radius |
|----------------------------------|-----------------|
| d ≤ 6: 0/-0.01   d > 6: 0/-0.015 | ±0.01           |

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     |

|    |   |     |    |    |    |
|----|---|-----|----|----|----|
| 6  | 1 | 60  | 9  | 16 | 6  |
| 8  | 1 | 65  | 12 | 25 | 8  |
| 10 | 2 | 70  | 15 | 25 | 10 |
| 10 | 2 | 100 | 15 | 30 | 10 |
| 12 | 2 | 70  | 18 | 30 | 12 |
| 12 | 2 | 100 | 18 | 35 | 12 |

| 1440HPA   |                               |                               |
|-----------|-------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
|           |                               | €                             |

|        |                        |
|--------|------------------------|
| 437751 | 1440HPA 6X1X16X60X6    |
| 437752 | 1440HPA 8X1X25X65X8    |
| 437753 | 1440HPA 10X2X25X70X10  |
| 438638 | 1440HPA 10X2X30X100X10 |
| 438639 | 1440HPA 12X2X30X70X12  |
| 438640 | 1440HPA 12X2X35X100X12 |

**Frese toriche in metallo duro integrale micrograna.**  
Corner radius end mills in solid carbide micro grain.

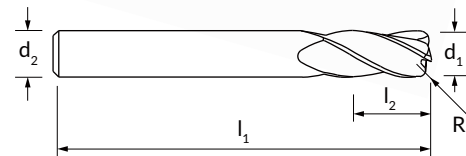
|  |  |   |  |   |
|--|--|---|--|---|
|  |  |   |  | - |
|  |  | - |  |   |

## Operazioni di fresatura | Milling strategies:

|  |  |   |   |  |   |
|--|--|---|---|--|---|
|  |  | - | - |  | - |
|--|--|---|---|--|---|

## Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |                                |
|---|---|---|---|---|---|--------------------------------|
|   |   |   |   |   |   | ● Raccomandato - Most suitable |
|   |   |   |   |   |   | ○ Possibile - Possible         |



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø          | Raggio   Radius |
|----------------------------------|-----------------|
| d ≤ 6: 0/-0.01   d > 6: 0/-0.015 | ±0.01           |

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |

|     |     |    |    |   |
|-----|-----|----|----|---|
| 1.5 | 0.2 | 45 | 4  | 4 |
| 1.5 | 0.3 | 45 | 4  | 4 |
| 2   | 0.2 | 45 | 6  | 4 |
| 2   | 0.3 | 45 | 6  | 4 |
| 2   | 0.5 | 45 | 6  | 4 |
| 3   | 0.2 | 60 | 8  | 6 |
| 3   | 0.3 | 60 | 8  | 6 |
| 3   | 0.5 | 60 | 8  | 6 |
| 4   | 0.2 | 70 | 11 | 6 |
| 4   | 0.3 | 70 | 11 | 6 |
| 4   | 0.5 | 70 | 11 | 6 |
| 4   | 1   | 70 | 11 | 6 |
| 5   | 0.5 | 70 | 11 | 6 |
| 6   | 0.2 | 80 | 13 | 6 |
| 6   | 0.3 | 60 | 13 | 6 |
| 6   | 0.3 | 80 | 13 | 6 |
| 6   | 0.5 | 60 | 13 | 6 |
| 6   | 0.5 | 80 | 13 | 6 |

| 1434HPA   |                               |                               |
|-----------|-------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
|           |                               | €                             |

|        |         |               |
|--------|---------|---------------|
| 438605 | 1434HPA | 1.5X.2X4X45X4 |
| 438606 | 1434HPA | 1.5X.3X4X45X4 |
| 438607 | 1434HPA | 2X.2X6X45X4   |
| 438608 | 1434HPA | 2X.3X6X45X4   |
| 438609 | 1434HPA | 2X.5X6X45X4   |
| 438610 | 1434HPA | 3X.2X8X60X6   |
| 438611 | 1434HPA | 3X.3X8X60X6   |
| 438612 | 1434HPA | 3X.5X8X60X6   |
| 438613 | 1434HPA | 4X.2X11X70X6  |
| 438614 | 1434HPA | 4X.3X11X70X6  |
| 438615 | 1434HPA | 4X.5X11X70X6  |
| 438616 | 1434HPA | 4X1X11X70X6   |
| 438617 | 1434HPA | 5X.5X11X70X6  |
| 438618 | 1434HPA | 6X.2X13X80X6  |
| 438619 | 1434HPA | 6X.3X13X60X6  |
| 438620 | 1434HPA | 6X.3X13X80X6  |
| 438621 | 1434HPA | 6X.5X13X60X6  |
| 437747 | 1434HPA | 6X.5X13X80X6  |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter | 1434HPA   |                                                                                     |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|-----------|-------------------------------------------------------------------------------------|-------------------------------|
|                                     |                                 |                                    |                                      |                                    | ART. NUM. | Codice d'ordine<br>Order code                                                       | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |           |  | €                             |
| 6                                   | 1                               | 60                                 | 13                                   | 6                                  | 438622    | 1434HPA 6X1X13X60X6                                                                 |                               |
| 6                                   | 1                               | 80                                 | 13                                   | 6                                  | 438623    | 1434HPA 6X1X13X80X6                                                                 |                               |
| 6                                   | 1.5                             | 80                                 | 13                                   | 6                                  | 438624    | 1434HPA 6X1.5X13X80X6                                                               |                               |
| 8                                   | 0.2                             | 90                                 | 19                                   | 8                                  | 438625    | 1434HPA 8X.2X19X90X8                                                                |                               |
| 8                                   | 0.3                             | 90                                 | 19                                   | 8                                  | 438626    | 1434HPA 8X.3X19X90X8                                                                |                               |
| 8                                   | 0.5                             | 70                                 | 19                                   | 8                                  | 438627    | 1434HPA 8X.5X19X70X8                                                                |                               |
| 8                                   | 0.5                             | 90                                 | 19                                   | 8                                  | 437748    | 1434HPA 8X.5X19X90X8                                                                |                               |
| 8                                   | 1                               | 70                                 | 19                                   | 8                                  | 438628    | 1434HPA 8X1X19X70X8                                                                 |                               |
| 8                                   | 1                               | 90                                 | 19                                   | 8                                  | 438629    | 1434HPA 8X1X19X90X8                                                                 |                               |
| 10                                  | 0.5                             | 75                                 | 22                                   | 10                                 | 437749    | 1434HPA 10X.5X22X100X10                                                             |                               |
| 10                                  | 0.5                             | 100                                | 22                                   | 10                                 | 438630    | 1434HPA 10X.5X22X75X10                                                              |                               |
| 10                                  | 1                               | 75                                 | 22                                   | 10                                 | 438632    | 1434HPA 10X1X22X100X10                                                              |                               |
| 10                                  | 1                               | 100                                | 22                                   | 10                                 | 438631    | 1434HPA 10X1X22X75X10                                                               |                               |
| 10                                  | 1.5                             | 100                                | 22                                   | 10                                 | 438633    | 1434HPA 10X1.5X22X100X10                                                            |                               |
| 12                                  | 0.5                             | 80                                 | 26                                   | 12                                 | 437750    | 1434HPA 12X.5X26X110X12                                                             |                               |
| 12                                  | 0.5                             | 110                                | 26                                   | 12                                 | 438634    | 1434HPA 12X.5X26X80X12                                                              |                               |
| 12                                  | 1                               | 80                                 | 26                                   | 12                                 | 438636    | 1434HPA 12X1X26X110X12                                                              |                               |
| 12                                  | 1                               | 110                                | 26                                   | 12                                 | 438635    | 1434HPA 12X1X26X80X12                                                               |                               |
| 12                                  | 2                               | 110                                | 26                                   | 12                                 | 438637    | 1434HPA 12X2X26X110X12                                                              |                               |

**Frese toriche con scarico in metallo duro integrale micrograna.**  
**Corner radius long neck end mills in solid carbide micro grain.**

|  |  |   |  |   |
|--|--|---|--|---|
|  |  |   |  | - |
|  |  | - |  |   |

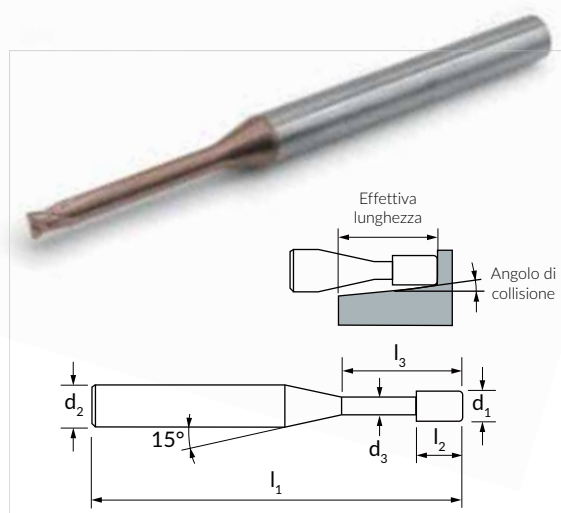
## Operazioni di fresatura | Milling strategies:

|  |  |   |   |  |   |
|--|--|---|---|--|---|
|  |  | - | - |  | - |
|--|--|---|---|--|---|

## Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |
|---|---|---|---|---|---|
|   |   |   |   |   |   |

● Raccomandato - Most suitable  
○ Possibile - Possible



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø                   | Raggio   Radius |
|-------------------------------------------|-----------------|
| $d \leq 6$ : 0/-0.01   $d > 6$ : 0/-0.015 | $\pm 0.01$      |

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |    |       |    |    |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-------|----|----|
| $d_1$                               | R                               | $l_1$                              | $l_2$                                | $l_3$                              | $d_2$                              | $d_3$                           | 30°                                                                                                                                                        | 1° | 1°30' | 2° | 3° |

| 1433HPA   |                               |                               |
|-----------|-------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
|           |                               | €                             |

|     |      |    |      |      |   |      |      |      |      |      |      |
|-----|------|----|------|------|---|------|------|------|------|------|------|
| 0.2 | 0.02 | 45 | 0.15 | 0.50 | 4 | 0.18 | 0.55 | 0.57 | 0.59 | 0.61 | 0.66 |
| 0.2 | 0.02 | 45 | 0.15 | 1.00 | 4 | 0.18 | 1.07 | 1.10 | 1.14 | 1.18 | 1.28 |
| 0.2 | 0.02 | 45 | 0.15 | 2.00 | 4 | 0.18 | 2.10 | 2.17 | 2.25 | 2.33 | 2.52 |
| 0.2 | 0.05 | 45 | 0.15 | 0.50 | 4 | 0.18 | 0.55 | 0.57 | 0.59 | 0.61 | 0.65 |
| 0.2 | 0.05 | 45 | 0.15 | 1.00 | 4 | 0.18 | 1.07 | 1.10 | 1.14 | 1.18 | 1.27 |
| 0.2 | 0.05 | 45 | 0.15 | 1.50 | 4 | 0.18 | 1.58 | 1.64 | 1.69 | 1.76 | 1.89 |
| 0.2 | 0.05 | 45 | 0.15 | 2.00 | 4 | 0.18 | 2.10 | 2.17 | 2.25 | 2.33 | 2.52 |
| 0.3 | 0.02 | 45 | 0.25 | 1.00 | 4 | 0.28 | 1.07 | 1.10 | 1.14 | 1.18 | 1.28 |
| 0.3 | 0.02 | 45 | 0.25 | 2.00 | 4 | 0.28 | 2.10 | 2.17 | 2.25 | 2.33 | 2.52 |
| 0.3 | 0.02 | 45 | 0.25 | 3.00 | 4 | 0.28 | 3.13 | 3.24 | 3.36 | 3.48 | 3.77 |
| 0.3 | 0.05 | 45 | 0.25 | 1.00 | 4 | 0.28 | 1.07 | 1.10 | 1.14 | 1.18 | 1.27 |
| 0.3 | 0.05 | 45 | 0.25 | 1.50 | 4 | 0.28 | 1.58 | 1.64 | 1.69 | 1.76 | 1.89 |
| 0.3 | 0.05 | 45 | 0.25 | 2.00 | 4 | 0.28 | 2.10 | 2.17 | 2.25 | 2.33 | 2.52 |
| 0.3 | 0.05 | 45 | 0.25 | 2.50 | 4 | 0.28 | 2.62 | 2.71 | 2.80 | 2.91 | 3.14 |
| 0.3 | 0.05 | 45 | 0.25 | 3.00 | 4 | 0.28 | 3.13 | 3.24 | 3.36 | 3.48 | 3.76 |
| 0.4 | 0.02 | 45 | 0.30 | 1.00 | 4 | 0.37 | 1.09 | 1.12 | 1.16 | 1.21 | 1.30 |
| 0.4 | 0.02 | 45 | 0.30 | 2.00 | 4 | 0.37 | 2.12 | 2.19 | 2.27 | 2.36 | 2.55 |
| 0.4 | 0.02 | 45 | 0.30 | 3.00 | 4 | 0.37 | 3.15 | 3.26 | 3.38 | 3.51 | 3.79 |

|        |         |                 |
|--------|---------|-----------------|
| 441730 | 1433HPA | .2X.02X.5X45X4  |
| 441731 | 1433HPA | .2X.02X1X45X4   |
| 441732 | 1433HPA | .2X.02X2X45X4   |
| 441733 | 1433HPA | .2X.05X.5X45X4  |
| 441734 | 1433HPA | .2X.05X1X45X4   |
| 441735 | 1433HPA | .2X.05X1.5X45X4 |
| 441736 | 1433HPA | .2X.05X2X45X4   |
| 441737 | 1433HPA | .3X.02X1X45X4   |
| 441738 | 1433HPA | .3X.02X2X45X4   |
| 441739 | 1433HPA | .3X.02X3X45X4   |
| 441740 | 1433HPA | .3X.05X1X45X4   |
| 441741 | 1433HPA | .3X.05X1.5X45X4 |
| 441742 | 1433HPA | .3X.05X2X45X4   |
| 441743 | 1433HPA | .3X.05X2.5X45X4 |
| 441744 | 1433HPA | .3X.05X3X45X4   |
| 441745 | 1433HPA | .4X.02X1X45X4   |
| 441746 | 1433HPA | .4X.02X2X45X4   |
| 441747 | 1433HPA | .4X.02X3X45X4   |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

|                                     |                                 |                                    |                                      |                                    |                                    |                                 |                                                                                                                                                            |      |       |      |      | 1433HPA   |                               |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|------|------|-----------|-------------------------------|-------------------------------|
| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |      |       |      |      | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30°                                                                                                                                                        | 1°   | 1°30' | 2°   | 3°   |           |                               | €                             |
| 0.4                                 | 0.02                            | 45                                 | 0.30                                 | 4.00                               | 4                                  | 0.37                            | 4.19                                                                                                                                                       | 4.33 | 4.49  | 4.66 | 5.03 | 441748    | 1433HPA .4X.02X4X45X4         |                               |
| 0.4                                 | 0.05                            | 45                                 | 0.30                                 | 1.00                               | 4                                  | 0.37                            | 1.08                                                                                                                                                       | 1.12 | 1.16  | 1.20 | 1.30 | 441749    | 1433HPA .4X.05X1X45X4         |                               |
| 0.4                                 | 0.05                            | 45                                 | 0.30                                 | 2.00                               | 4                                  | 0.37                            | 2.12                                                                                                                                                       | 2.19 | 2.27  | 2.35 | 2.54 | 441750    | 1433HPA .4X.05X2X45X4         |                               |
| 0.4                                 | 0.05                            | 45                                 | 0.30                                 | 3.00                               | 4                                  | 0.37                            | 3.15                                                                                                                                                       | 3.26 | 3.38  | 3.50 | 3.78 | 441751    | 1433HPA .4X.05X3X45X4         |                               |
| 0.4                                 | 0.05                            | 45                                 | 0.30                                 | 4.00                               | 4                                  | 0.37                            | 4.19                                                                                                                                                       | 4.33 | 4.48  | 4.65 | 5.03 | 441752    | 1433HPA .4X.05X4X45X4         |                               |
| 0.4                                 | 0.1                             | 45                                 | 0.30                                 | 1.00                               | 4                                  | 0.37                            | 1.08                                                                                                                                                       | 1.12 | 1.15  | 1.19 | 1.28 | 441753    | 1433HPA .4X.1X1X45X4          |                               |
| 0.4                                 | 0.1                             | 45                                 | 0.30                                 | 2.00                               | 4                                  | 0.37                            | 2.12                                                                                                                                                       | 2.19 | 2.26  | 2.34 | 2.53 | 441754    | 1433HPA .4X.1X2X45X4          |                               |
| 0.4                                 | 0.1                             | 45                                 | 0.30                                 | 3.00                               | 4                                  | 0.37                            | 3.15                                                                                                                                                       | 3.26 | 3.37  | 3.49 | 3.77 | 441755    | 1433HPA .4X.1X3X45X4          |                               |
| 0.4                                 | 0.1                             | 45                                 | 0.30                                 | 4.00                               | 4                                  | 0.37                            | 4.18                                                                                                                                                       | 4.33 | 4.48  | 4.64 | 5.01 | 441756    | 1433HPA .4X.1X4X45X4          |                               |
| 0.5                                 | 0.02                            | 45                                 | 0.40                                 | 1.00                               | 4                                  | 0.47                            | 1.09                                                                                                                                                       | 1.12 | 1.16  | 1.21 | 1.30 | 441757    | 1433HPA .5X.02X1X45X4         |                               |
| 0.5                                 | 0.02                            | 45                                 | 0.40                                 | 2.00                               | 4                                  | 0.47                            | 2.12                                                                                                                                                       | 2.19 | 2.27  | 2.36 | 2.55 | 441758    | 1433HPA .5X.02X2X45X4         |                               |
| 0.5                                 | 0.02                            | 45                                 | 0.40                                 | 3.00                               | 4                                  | 0.47                            | 3.15                                                                                                                                                       | 3.26 | 3.38  | 3.51 | 3.79 | 441759    | 1433HPA .5X.02X3X45X4         |                               |
| 0.5                                 | 0.02                            | 45                                 | 0.40                                 | 4.00                               | 4                                  | 0.47                            | 4.19                                                                                                                                                       | 4.33 | 4.49  | 4.66 | 5.03 | 441760    | 1433HPA .5X.02X4X45X4         |                               |
| 0.5                                 | 0.02                            | 45                                 | 0.40                                 | 5.00                               | 4                                  | 0.47                            | 5.22                                                                                                                                                       | 5.40 | 5.60  | 5.81 | 6.28 | 441761    | 1433HPA .5X.02X5X45X4         |                               |
| 0.5                                 | 0.05                            | 45                                 | 0.40                                 | 1.00                               | 4                                  | 0.47                            | 1.08                                                                                                                                                       | 1.12 | 1.16  | 1.20 | 1.30 | 441762    | 1433HPA .5X.05X1X45X4         |                               |
| 0.5                                 | 0.05                            | 45                                 | 0.40                                 | 2.00                               | 4                                  | 0.47                            | 2.12                                                                                                                                                       | 2.19 | 2.27  | 2.35 | 2.54 | 441763    | 1433HPA .5X.05X2X45X4         |                               |
| 0.5                                 | 0.05                            | 45                                 | 0.40                                 | 3.00                               | 4                                  | 0.47                            | 3.15                                                                                                                                                       | 3.26 | 3.38  | 3.50 | 3.78 | 441764    | 1433HPA .5X.05X3X45X4         |                               |
| 0.5                                 | 0.05                            | 45                                 | 0.40                                 | 4.00                               | 4                                  | 0.47                            | 4.19                                                                                                                                                       | 4.33 | 4.48  | 4.65 | 5.03 | 441765    | 1433HPA .5X.05X4X45X4         |                               |
| 0.5                                 | 0.05                            | 45                                 | 0.40                                 | 5.00                               | 4                                  | 0.47                            | 5.22                                                                                                                                                       | 5.40 | 5.59  | 5.80 | 6.27 | 441766    | 1433HPA .5X.05X5X45X4         |                               |
| 0.5                                 | 0.1                             | 45                                 | 0.40                                 | 1.00                               | 4                                  | 0.47                            | 1.08                                                                                                                                                       | 1.12 | 1.15  | 1.19 | 1.28 | 441767    | 1433HPA .5X.1X1X45X4          |                               |
| 0.5                                 | 0.1                             | 45                                 | 0.40                                 | 2.00                               | 4                                  | 0.47                            | 2.12                                                                                                                                                       | 2.19 | 2.26  | 2.34 | 2.53 | 441768    | 1433HPA .5X.1X2X45X4          |                               |
| 0.5                                 | 0.1                             | 45                                 | 0.40                                 | 3.00                               | 4                                  | 0.47                            | 3.15                                                                                                                                                       | 3.26 | 3.37  | 3.49 | 3.77 | 441769    | 1433HPA .5X.1X3X45X4          |                               |
| 0.5                                 | 0.1                             | 45                                 | 0.40                                 | 4.00                               | 4                                  | 0.47                            | 4.18                                                                                                                                                       | 4.33 | 4.48  | 4.64 | 5.01 | 441770    | 1433HPA .5X.1X4X45X4          |                               |
| 0.5                                 | 0.1                             | 45                                 | 0.40                                 | 5.00                               | 4                                  | 0.47                            | 5.22                                                                                                                                                       | 5.40 | 5.59  | 5.79 | 6.26 | 441771    | 1433HPA .5X.1X5X45X4          |                               |
| 0.6                                 | 0.02                            | 45                                 | 0.50                                 | 2.00                               | 4                                  | 0.57                            | 2.12                                                                                                                                                       | 2.19 | 2.27  | 2.36 | 2.55 | 441772    | 1433HPA .6X.02X2X45X4         |                               |
| 0.6                                 | 0.02                            | 45                                 | 0.50                                 | 4.00                               | 4                                  | 0.57                            | 4.19                                                                                                                                                       | 4.33 | 4.49  | 4.66 | 5.03 | 441773    | 1433HPA .6X.02X4X45X4         |                               |
| 0.6                                 | 0.02                            | 45                                 | 0.50                                 | 6.00                               | 4                                  | 0.57                            | 6.25                                                                                                                                                       | 6.47 | 6.70  | 6.96 | 7.52 | 441774    | 1433HPA .6X.02X6X45X4         |                               |
| 0.6                                 | 0.05                            | 45                                 | 0.50                                 | 2.00                               | 4                                  | 0.57                            | 2.12                                                                                                                                                       | 2.19 | 2.27  | 2.35 | 2.54 | 441775    | 1433HPA .6X.05X2X45X4         |                               |
| 0.6                                 | 0.05                            | 45                                 | 0.50                                 | 4.00                               | 4                                  | 0.57                            | 4.19                                                                                                                                                       | 4.33 | 4.48  | 4.65 | 5.03 | 441776    | 1433HPA .6X.05X4X45X4         |                               |
| 0.6                                 | 0.05                            | 45                                 | 0.50                                 | 6.00                               | 4                                  | 0.57                            | 6.25                                                                                                                                                       | 6.47 | 6.70  | 6.95 | 7.51 | 441777    | 1433HPA .6X.05X6X45X4         |                               |
| 0.6                                 | 0.1                             | 45                                 | 0.50                                 | 2.00                               | 4                                  | 0.57                            | 2.12                                                                                                                                                       | 2.19 | 2.26  | 2.34 | 2.53 | 441778    | 1433HPA .6X.1X2X45X4          |                               |
| 0.6                                 | 0.1                             | 45                                 | 0.50                                 | 4.00                               | 4                                  | 0.57                            | 4.18                                                                                                                                                       | 4.33 | 4.48  | 4.64 | 5.01 | 441779    | 1433HPA .6X.1X4X45X4          |                               |
| 0.6                                 | 0.1                             | 45                                 | 0.50                                 | 6.00                               | 4                                  | 0.57                            | 6.25                                                                                                                                                       | 6.47 | 6.70  | 6.94 | 7.50 | 441780    | 1433HPA .6X.1X6X45X4          |                               |
| 0.7                                 | 0.05                            | 45                                 | 0.55                                 | 4.00                               | 4                                  | 0.66                            | 4.21                                                                                                                                                       | 4.35 | 4.51  | 4.67 | 5.05 | 441781    | 1433HPA .7X.05X4X45X4         |                               |
| 0.7                                 | 0.05                            | 45                                 | 0.55                                 | 6.00                               | 4                                  | 0.66                            | 6.27                                                                                                                                                       | 6.49 | 6.72  | 6.97 | 7.53 | 441782    | 1433HPA .7X.05X6X45X4         |                               |
| 0.7                                 | 0.1                             | 45                                 | 0.55                                 | 4.00                               | 4                                  | 0.66                            | 4.20                                                                                                                                                       | 4.35 | 4.50  | 4.67 | 5.04 | 441783    | 1433HPA .7X.1X4X45X4          |                               |
| 0.7                                 | 0.1                             | 45                                 | 0.55                                 | 6.00                               | 4                                  | 0.66                            | 6.27                                                                                                                                                       | 6.49 | 6.72  | 6.96 | 7.52 | 441784    | 1433HPA .7X.1X6X45X4          |                               |
| 0.8                                 | 0.02                            | 45                                 | 0.65                                 | 2.00                               | 4                                  | 0.77                            | 2.12                                                                                                                                                       | 2.19 | 2.27  | 2.36 | 2.55 | 441785    | 1433HPA .8X.02X2X45X4         |                               |
| 0.8                                 | 0.02                            | 45                                 | 0.65                                 | 4.00                               | 4                                  | 0.77                            | 4.19                                                                                                                                                       | 4.33 | 4.49  | 4.66 | 5.03 | 441786    | 1433HPA .8X.02X4X45X4         |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

Per Acciai Temprati ≤55 HRC  
For Hardened Steels ≤55 HRC

Frese toriche con scarico in metallo duro integrale micrograna.  
Corner radius long neck end mills in solid carbide micro grain.

| 1433HPA                             |                                 |                                    |                                      |                                    |                                    |                                 |                                                                                                                                                            |       |       |       |       |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|
| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |       |       |       |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30°                                                                                                                                                        | 1°    | 1°30' | 2°    | 3°    |
| 0.8                                 | 0.02                            | 45                                 | 0.65                                 | 6.00                               | 4                                  | 0.77                            | 6.25                                                                                                                                                       | 6.47  | 6.70  | 6.96  | 7.52  |
| 0.8                                 | 0.02                            | 45                                 | 0.65                                 | 8.00                               | 4                                  | 0.77                            | 8.32                                                                                                                                                       | 8.61  | 8.92  | 9.26  | 10.00 |
| 0.8                                 | 0.05                            | 45                                 | 0.65                                 | 2.00                               | 4                                  | 0.77                            | 2.12                                                                                                                                                       | 2.19  | 2.27  | 2.35  | 2.54  |
| 0.8                                 | 0.05                            | 45                                 | 0.65                                 | 4.00                               | 4                                  | 0.77                            | 4.19                                                                                                                                                       | 4.33  | 4.48  | 4.65  | 5.03  |
| 0.8                                 | 0.05                            | 45                                 | 0.65                                 | 6.00                               | 4                                  | 0.77                            | 6.25                                                                                                                                                       | 6.47  | 6.70  | 6.95  | 7.51  |
| 0.8                                 | 0.05                            | 45                                 | 0.65                                 | 8.00                               | 4                                  | 0.77                            | 8.32                                                                                                                                                       | 8.61  | 8.92  | 9.25  | 10.00 |
| 0.8                                 | 0.1                             | 45                                 | 0.65                                 | 2.00                               | 4                                  | 0.77                            | 2.12                                                                                                                                                       | 2.19  | 2.26  | 2.34  | 2.53  |
| 0.8                                 | 0.1                             | 45                                 | 0.65                                 | 4.00                               | 4                                  | 0.77                            | 4.18                                                                                                                                                       | 4.33  | 4.48  | 4.64  | 5.01  |
| 0.8                                 | 0.1                             | 45                                 | 0.65                                 | 6.00                               | 4                                  | 0.77                            | 6.25                                                                                                                                                       | 6.47  | 6.70  | 6.94  | 7.50  |
| 0.8                                 | 0.1                             | 45                                 | 0.65                                 | 8.00                               | 4                                  | 0.77                            | 8.32                                                                                                                                                       | 8.61  | 8.91  | 9.24  | 9.99  |
| 0.8                                 | 0.2                             | 45                                 | 0.65                                 | 2.00                               | 4                                  | 0.77                            | 2.11                                                                                                                                                       | 2.18  | 2.25  | 2.33  | 2.50  |
| 0.8                                 | 0.2                             | 45                                 | 0.65                                 | 4.00                               | 4                                  | 0.77                            | 4.18                                                                                                                                                       | 4.32  | 4.47  | 4.63  | 4.99  |
| 0.8                                 | 0.2                             | 45                                 | 0.65                                 | 6.00                               | 4                                  | 0.77                            | 6.25                                                                                                                                                       | 6.46  | 6.69  | 6.93  | 7.47  |
| 0.8                                 | 0.2                             | 45                                 | 0.65                                 | 8.00                               | 4                                  | 0.77                            | 8.32                                                                                                                                                       | 8.60  | 8.90  | 9.23  | 9.96  |
| 0.9                                 | 0.1                             | 45                                 | 0.70                                 | 4.00                               | 4                                  | 0.85                            | 4.22                                                                                                                                                       | 4.37  | 4.52  | 4.69  | 5.06  |
| 0.9                                 | 0.1                             | 45                                 | 0.70                                 | 8.00                               | 4                                  | 0.85                            | 8.36                                                                                                                                                       | 8.65  | 8.95  | 9.29  | 10.03 |
| 1                                   | 0.02                            | 45                                 | 0.80                                 | 2.00                               | 4                                  | 0.95                            | 2.16                                                                                                                                                       | 2.23  | 2.31  | 2.40  | 2.59  |
| 1                                   | 0.02                            | 45                                 | 0.80                                 | 4.00                               | 4                                  | 0.95                            | 4.23                                                                                                                                                       | 4.37  | 4.53  | 4.70  | 5.08  |
| 1                                   | 0.02                            | 45                                 | 0.80                                 | 6.00                               | 4                                  | 0.95                            | 6.29                                                                                                                                                       | 6.51  | 6.75  | 7.00  | 7.56  |
| 1                                   | 0.02                            | 45                                 | 0.80                                 | 8.00                               | 4                                  | 0.95                            | 8.36                                                                                                                                                       | 8.65  | 8.96  | 9.30  | 10.05 |
| 1                                   | 0.02                            | 45                                 | 0.80                                 | 10.00                              | 4                                  | 0.95                            | 10.43                                                                                                                                                      | 10.79 | 11.18 | 11.60 | 12.54 |
| 1                                   | 0.05                            | 45                                 | 0.80                                 | 2.00                               | 4                                  | 0.95                            | 2.16                                                                                                                                                       | 2.23  | 2.31  | 2.39  | 2.59  |
| 1                                   | 0.05                            | 45                                 | 0.80                                 | 4.00                               | 4                                  | 0.95                            | 4.22                                                                                                                                                       | 4.37  | 4.53  | 4.69  | 5.07  |
| 1                                   | 0.05                            | 45                                 | 0.80                                 | 6.00                               | 4                                  | 0.95                            | 6.29                                                                                                                                                       | 6.51  | 6.74  | 6.99  | 7.56  |
| 1                                   | 0.05                            | 45                                 | 0.80                                 | 8.00                               | 4                                  | 0.95                            | 8.36                                                                                                                                                       | 8.65  | 8.96  | 9.29  | 10.04 |
| 1                                   | 0.05                            | 45                                 | 0.80                                 | 10.00                              | 4                                  | 0.95                            | 10.43                                                                                                                                                      | 10.79 | 11.18 | 11.59 | 12.53 |
| 1                                   | 0.05                            | 45                                 | 0.80                                 | 12.00                              | 4                                  | 0.95                            | 12.49                                                                                                                                                      | 12.93 | 13.39 | 13.89 | 15.02 |
| 1                                   | 0.05                            | 50                                 | 0.80                                 | 16.00                              | 4                                  | 0.95                            | 16.63                                                                                                                                                      | 17.21 | 17.83 | 18.49 | 19.99 |
| 1                                   | 0.05                            | 50                                 | 0.80                                 | 20.00                              | 4                                  | 0.95                            | 20.76                                                                                                                                                      | 21.48 | 22.26 | 23.09 | 24.96 |
| 1                                   | 0.1                             | 45                                 | 0.80                                 | 2.00                               | 4                                  | 0.95                            | 2.16                                                                                                                                                       | 2.23  | 2.30  | 2.39  | 2.57  |
| 1                                   | 0.1                             | 45                                 | 0.80                                 | 4.00                               | 4                                  | 0.95                            | 4.22                                                                                                                                                       | 4.37  | 4.52  | 4.69  | 5.06  |
| 1                                   | 0.1                             | 45                                 | 0.80                                 | 6.00                               | 4                                  | 0.95                            | 6.29                                                                                                                                                       | 6.51  | 6.74  | 6.99  | 7.55  |
| 1                                   | 0.1                             | 45                                 | 0.80                                 | 8.00                               | 4                                  | 0.95                            | 8.36                                                                                                                                                       | 8.65  | 8.95  | 9.29  | 10.03 |
| 1                                   | 0.1                             | 45                                 | 0.80                                 | 10.00                              | 4                                  | 0.95                            | 10.42                                                                                                                                                      | 10.78 | 11.17 | 11.59 | 12.52 |
| 1                                   | 0.1                             | 45                                 | 0.80                                 | 12.00                              | 4                                  | 0.95                            | 12.49                                                                                                                                                      | 12.92 | 13.39 | 13.89 | 15.00 |
| 1                                   | 0.1                             | 50                                 | 0.80                                 | 16.00                              | 4                                  | 0.95                            | 16.63                                                                                                                                                      | 17.20 | 17.82 | 18.48 | 19.98 |
| 1                                   | 0.1                             | 50                                 | 0.80                                 | 20.00                              | 4                                  | 0.95                            | 20.76                                                                                                                                                      | 21.48 | 22.25 | 23.08 | 24.95 |
| 1                                   | 0.2                             | 45                                 | 0.80                                 | 2.00                               | 4                                  | 0.95                            | 2.15                                                                                                                                                       | 2.22  | 2.29  | 2.37  | 2.55  |
| 1                                   | 0.2                             | 45                                 | 0.80                                 | 4.00                               | 4                                  | 0.95                            | 4.22                                                                                                                                                       | 4.36  | 4.51  | 4.67  | 5.03  |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |       |       |        |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|--------|
|                                     |                                 |                                    |                                      |                                    |                                    |                                 | 30°                                                                                                                                                        | 1°    | 1°30' | 2°    | 3°     |
| <b>d<sub>1</sub></b>                | <b>R</b>                        | <b>l<sub>1</sub></b>               | <b>l<sub>2</sub></b>                 | <b>l<sub>3</sub></b>               | <b>d<sub>2</sub></b>               | <b>d<sub>3</sub></b>            |                                                                                                                                                            |       |       |       |        |
| 1                                   | 0.2                             | 45                                 | 0.80                                 | 6.00                               | 4                                  | 0.95                            | 6.29                                                                                                                                                       | 6.50  | 6.73  | 6.97  | 7.52   |
| 1                                   | 0.2                             | 45                                 | 0.80                                 | 8.00                               | 4                                  | 0.95                            | 8.35                                                                                                                                                       | 8.64  | 8.94  | 9.27  | 10.01  |
| 1                                   | 0.2                             | 45                                 | 0.80                                 | 10.00                              | 4                                  | 0.95                            | 10.42                                                                                                                                                      | 10.78 | 11.16 | 11.57 | 12.49  |
| 1                                   | 0.2                             | 45                                 | 0.80                                 | 12.00                              | 4                                  | 0.95                            | 12.49                                                                                                                                                      | 12.92 | 13.38 | 13.87 | 14.98  |
| 1                                   | 0.2                             | 50                                 | 0.80                                 | 16.00                              | 4                                  | 0.95                            | 16.62                                                                                                                                                      | 17.20 | 17.81 | 18.47 | 19.95  |
| 1                                   | 0.2                             | 50                                 | 0.80                                 | 20.00                              | 4                                  | 0.95                            | 20.76                                                                                                                                                      | 21.47 | 22.24 | 23.07 | 24.93  |
| 1                                   | 0.3                             | 45                                 | 0.80                                 | 2.00                               | 4                                  | 0.95                            | 2.15                                                                                                                                                       | 2.21  | 2.28  | 2.36  | 2.52   |
| 1                                   | 0.3                             | 45                                 | 0.80                                 | 4.00                               | 4                                  | 0.95                            | 4.22                                                                                                                                                       | 4.35  | 4.50  | 4.66  | 5.01   |
| 1                                   | 0.3                             | 45                                 | 0.80                                 | 6.00                               | 4                                  | 0.95                            | 6.28                                                                                                                                                       | 6.49  | 6.72  | 6.96  | 7.50   |
| 1                                   | 0.3                             | 45                                 | 0.80                                 | 8.00                               | 4                                  | 0.95                            | 8.35                                                                                                                                                       | 8.63  | 8.93  | 9.26  | 9.98   |
| 1                                   | 0.3                             | 45                                 | 0.80                                 | 10.00                              | 4                                  | 0.95                            | 10.42                                                                                                                                                      | 10.77 | 11.15 | 11.56 | 12.47  |
| 1                                   | 0.3                             | 45                                 | 0.80                                 | 12.00                              | 4                                  | 0.95                            | 12.49                                                                                                                                                      | 12.91 | 13.37 | 13.86 | 14.96  |
| 1                                   | 0.3                             | 50                                 | 0.80                                 | 16.00                              | 4                                  | 0.95                            | 16.62                                                                                                                                                      | 17.19 | 17.80 | 18.46 | 19.93  |
| 1                                   | 0.3                             | 50                                 | 0.80                                 | 20.00                              | 4                                  | 0.95                            | 20.75                                                                                                                                                      | 21.47 | 22.23 | 23.05 | 24.90  |
| 1.2                                 | 0.1                             | 45                                 | 1.00                                 | 4.00                               | 4                                  | 1.14                            | 4.24                                                                                                                                                       | 4.39  | 4.54  | 4.71  | 5.08   |
| 1.2                                 | 0.1                             | 45                                 | 1.00                                 | 6.00                               | 4                                  | 1.14                            | 6.31                                                                                                                                                       | 6.53  | 6.76  | 7.01  | 7.57   |
| 1.2                                 | 0.1                             | 45                                 | 1.00                                 | 10.00                              | 4                                  | 1.14                            | 10.44                                                                                                                                                      | 10.80 | 11.19 | 11.61 | 12.54  |
| 1.2                                 | 0.2                             | 45                                 | 1.00                                 | 4.00                               | 4                                  | 1.14                            | 4.24                                                                                                                                                       | 4.38  | 4.53  | 4.69  | 5.06   |
| 1.2                                 | 0.2                             | 45                                 | 1.00                                 | 6.00                               | 4                                  | 1.14                            | 6.31                                                                                                                                                       | 6.52  | 6.75  | 6.99  | 7.54   |
| 1.2                                 | 0.2                             | 45                                 | 1.00                                 | 10.00                              | 4                                  | 1.14                            | 10.44                                                                                                                                                      | 10.80 | 11.18 | 11.59 | 12.52  |
| 1.2                                 | 0.3                             | 45                                 | 1.00                                 | 4.00                               | 4                                  | 1.14                            | 4.24                                                                                                                                                       | 4.37  | 4.52  | 4.68  | 5.03   |
| 1.2                                 | 0.3                             | 45                                 | 1.00                                 | 6.00                               | 4                                  | 1.14                            | 6.30                                                                                                                                                       | 6.51  | 6.74  | 6.98  | 7.52   |
| 1.2                                 | 0.3                             | 45                                 | 1.00                                 | 10.00                              | 4                                  | 1.14                            | 10.44                                                                                                                                                      | 10.79 | 11.17 | 11.58 | 12.49  |
| 1.5                                 | 0.05                            | 45                                 | 1.50                                 | 3.00                               | 4                                  | 1.44                            | 3.21                                                                                                                                                       | 3.32  | 3.44  | 3.57  | 3.85   |
| 1.5                                 | 0.05                            | 45                                 | 1.50                                 | 4.00                               | 4                                  | 1.44                            | 4.24                                                                                                                                                       | 4.39  | 4.55  | 4.72  | 5.09   |
| 1.5                                 | 0.05                            | 45                                 | 1.50                                 | 6.00                               | 4                                  | 1.44                            | 6.31                                                                                                                                                       | 6.53  | 6.76  | 7.02  | 7.58   |
| 1.5                                 | 0.05                            | 45                                 | 1.50                                 | 8.00                               | 4                                  | 1.44                            | 8.38                                                                                                                                                       | 8.67  | 8.98  | 9.32  | 10.07  |
| 1.5                                 | 0.05                            | 45                                 | 1.50                                 | 10.00                              | 4                                  | 1.44                            | 10.45                                                                                                                                                      | 10.81 | 11.20 | 11.61 | 12.55  |
| 1.5                                 | 0.05                            | 45                                 | 1.50                                 | 12.00                              | 4                                  | 1.44                            | 12.51                                                                                                                                                      | 12.95 | 13.41 | 13.91 | 15.04  |
| 1.5                                 | 0.05                            | 50                                 | 1.50                                 | 16.00                              | 4                                  | 1.44                            | 16.65                                                                                                                                                      | 17.23 | 17.85 | 18.51 | 20.01  |
| 1.5                                 | 0.05                            | 50                                 | 1.50                                 | 20.00                              | 4                                  | 1.44                            | 20.78                                                                                                                                                      | 21.50 | 22.28 | 23.11 | libero |
| 1.5                                 | 0.1                             | 45                                 | 1.50                                 | 3.00                               | 4                                  | 1.44                            | 3.21                                                                                                                                                       | 3.32  | 3.43  | 3.56  | 3.84   |
| 1.5                                 | 0.1                             | 45                                 | 1.50                                 | 4.00                               | 4                                  | 1.44                            | 4.24                                                                                                                                                       | 4.39  | 4.54  | 4.71  | 5.08   |
| 1.5                                 | 0.1                             | 45                                 | 1.50                                 | 6.00                               | 4                                  | 1.44                            | 6.31                                                                                                                                                       | 6.53  | 6.76  | 7.01  | 7.57   |
| 1.5                                 | 0.1                             | 45                                 | 1.50                                 | 8.00                               | 4                                  | 1.44                            | 8.38                                                                                                                                                       | 8.67  | 8.97  | 9.31  | 10.06  |
| 1.5                                 | 0.1                             | 45                                 | 1.50                                 | 10.00                              | 4                                  | 1.44                            | 10.44                                                                                                                                                      | 10.80 | 11.19 | 11.61 | 12.54  |
| 1.5                                 | 0.1                             | 45                                 | 1.50                                 | 12.00                              | 4                                  | 1.44                            | 12.51                                                                                                                                                      | 12.94 | 13.41 | 13.91 | 15.03  |
| 1.5                                 | 0.1                             | 50                                 | 1.50                                 | 16.00                              | 4                                  | 1.44                            | 16.65                                                                                                                                                      | 17.22 | 17.84 | 18.51 | 20.00  |
| 1.5                                 | 0.1                             | 50                                 | 1.50                                 | 20.00                              | 4                                  | 1.44                            | 20.78                                                                                                                                                      | 21.50 | 22.27 | 23.11 | libero |

| 1433HPA   |                               |                                                                                     |                               |
|-----------|-------------------------------|-------------------------------------------------------------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code |  | Prezzo utensile<br>Tool Price |
|           |                               |                                                                                     | €                             |
| 441826    | 1433HPA                       | 1X.2X6X45X4                                                                         |                               |
| 441827    | 1433HPA                       | 1X.2X8X45X4                                                                         |                               |
| 441829    | 1433HPA                       | 1X.2X10X45X4                                                                        |                               |
| 441830    | 1433HPA                       | 1X.2X12X45X4                                                                        |                               |
| 441831    | 1433HPA                       | 1X.2X16X50X4                                                                        |                               |
| 441832    | 1433HPA                       | 1X.2X20X50X4                                                                        |                               |
| 441833    | 1433HPA                       | 1X.3X2X45X4                                                                         |                               |
| 441834    | 1433HPA                       | 1X.3X4X45X4                                                                         |                               |
| 441835    | 1433HPA                       | 1X.3X6X45X4                                                                         |                               |
| 441836    | 1433HPA                       | 1X.3X8X45X4                                                                         |                               |
| 441837    | 1433HPA                       | 1X.3X10X45X4                                                                        |                               |
| 441838    | 1433HPA                       | 1X.3X12X45X4                                                                        |                               |
| 441839    | 1433HPA                       | 1X.3X16X50X4                                                                        |                               |
| 441840    | 1433HPA                       | 1X.3X20X50X4                                                                        |                               |
| 441841    | 1433HPA                       | 1.2X.1X4X45X4                                                                       |                               |
| 441842    | 1433HPA                       | 1.2X.1X6X45X4                                                                       |                               |
| 441843    | 1433HPA                       | 1.2X.1X10X45X4                                                                      |                               |
| 441844    | 1433HPA                       | 1.2X.2X4X45X4                                                                       |                               |
| 441845    | 1433HPA                       | 1.2X.2X6X45X4                                                                       |                               |
| 441846    | 1433HPA                       | 1.2X.2X10X45X4                                                                      |                               |
| 441847    | 1433HPA                       | 1.2X.3X4X45X4                                                                       |                               |
| 441848    | 1433HPA                       | 1.2X.3X6X45X4                                                                       |                               |
| 441849    | 1433HPA                       | 1.2X.3X10X45X4                                                                      |                               |
| 441850    | 1433HPA                       | 1.5X.05X3X45X4                                                                      |                               |
| 441851    | 1433HPA                       | 1.5X.05X4X45X4                                                                      |                               |
| 441852    | 1433HPA                       | 1.5X.05X6X45X4                                                                      |                               |
| 441853    | 1433HPA                       | 1.5X.05X8X45X4                                                                      |                               |
| 441854    | 1433HPA                       | 1.5X.05X10X45X4                                                                     |                               |
| 442448    | 1433HPA                       | 1.5X.05X12X45X4                                                                     |                               |
| 441856    | 1433HPA                       | 1.5X.05X16X50X4                                                                     |                               |
| 441857    | 1433HPA                       | 1.5X.05X20X50X4                                                                     |                               |
| 441858    | 1433HPA                       | 1.5X.1X3X45X4                                                                       |                               |
| 441859    | 1433HPA                       | 1.5X.1X4X45X4                                                                       |                               |
| 441860    | 1433HPA                       | 1.5X.1X6X45X4                                                                       |                               |
| 441861    | 1433HPA                       | 1.5X.1X8X45X4                                                                       |                               |
| 441862    | 1433HPA                       | 1.5X.1X10X45X4                                                                      |                               |
| 441863    | 1433HPA                       | 1.5X.1X12X45X4                                                                      |                               |
| 441864    | 1433HPA                       | 1.5X.1X16X50X4                                                                      |                               |
| 441865    | 1433HPA                       | 1.5X.1X20X50X4                                                                      |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page &gt;&gt;

 Per Acciai Temprati ≤55 HRC  
For Hardened Steels ≤55 HRC

Frese toriche con scarico in metallo duro integrale micrograna.  
Corner radius long neck end mills in solid carbide micro grain.

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |       |       |        | 1433HPA   |                               |                                                                                     | Prezzo utensile<br>Tool Price |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|--------|-----------|-------------------------------|-------------------------------------------------------------------------------------|-------------------------------|
|                                     |                                 |                                    |                                      |                                    |                                    |                                 | 30°                                                                                                                                                        | 1°    | 1°30' | 2°    | 3°     | ART. NUM. | Codice d'ordine<br>Order code |  |                               |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  |                                                                                                                                                            |       |       |       |        |           |                               |                                                                                     | €                             |
| 1.5                                 | 0.2                             | 45                                 | 1.50                                 | 3.00                               | 4                                  | 1.44                            | 3.20                                                                                                                                                       | 3.31  | 3.42  | 3.54  | 3.81   | 441866    | 1433HPA                       | 1.5X.2X3X45X4                                                                       |                               |
| 1.5                                 | 0.2                             | 45                                 | 1.50                                 | 4.00                               | 4                                  | 1.44                            | 4.24                                                                                                                                                       | 4.38  | 4.53  | 4.69  | 5.06   | 441867    | 1433HPA                       | 1.5X.2X4X45X4                                                                       |                               |
| 1.5                                 | 0.2                             | 45                                 | 1.50                                 | 6.00                               | 4                                  | 1.44                            | 6.31                                                                                                                                                       | 6.52  | 6.75  | 6.99  | 7.54   | 441868    | 1433HPA                       | 1.5X.2X6X45X4                                                                       |                               |
| 1.5                                 | 0.2                             | 45                                 | 1.50                                 | 8.00                               | 4                                  | 1.44                            | 8.37                                                                                                                                                       | 8.66  | 8.96  | 9.29  | 10.03  | 441869    | 1433HPA                       | 1.5X.2X8X45X4                                                                       |                               |
| 1.5                                 | 0.2                             | 45                                 | 1.50                                 | 10.00                              | 4                                  | 1.44                            | 10.44                                                                                                                                                      | 10.80 | 11.18 | 11.59 | 12.52  | 441870    | 1433HPA                       | 1.5X.2X10X45X4                                                                      |                               |
| 1.5                                 | 0.2                             | 45                                 | 1.50                                 | 12.00                              | 4                                  | 1.44                            | 12.51                                                                                                                                                      | 12.94 | 13.40 | 13.89 | 15.00  | 441871    | 1433HPA                       | 1.5X.2X12X45X4                                                                      |                               |
| 1.5                                 | 0.2                             | 50                                 | 1.50                                 | 16.00                              | 4                                  | 1.44                            | 16.64                                                                                                                                                      | 17.22 | 17.83 | 18.49 | 19.98  | 441872    | 1433HPA                       | 1.5X.2X16X50X4                                                                      |                               |
| 1.5                                 | 0.2                             | 50                                 | 1.50                                 | 20.00                              | 4                                  | 1.44                            | 20.78                                                                                                                                                      | 21.49 | 22.26 | 23.09 | libero | 441873    | 1433HPA                       | 1.5X.2X20X50X4                                                                      |                               |
| 1.5                                 | 0.3                             | 45                                 | 1.50                                 | 3.00                               | 4                                  | 1.44                            | 3.20                                                                                                                                                       | 3.30  | 3.41  | 3.53  | 3.79   | 441874    | 1433HPA                       | 1.5X.3X3X45X4                                                                       |                               |
| 1.5                                 | 0.3                             | 45                                 | 1.50                                 | 4.00                               | 4                                  | 1.44                            | 4.24                                                                                                                                                       | 4.37  | 4.52  | 4.68  | 5.03   | 441875    | 1433HPA                       | 1.5X.3X4X45X4                                                                       |                               |
| 1.5                                 | 0.3                             | 45                                 | 1.50                                 | 6.00                               | 4                                  | 1.44                            | 6.30                                                                                                                                                       | 6.51  | 6.74  | 6.98  | 7.52   | 441876    | 1433HPA                       | 1.5X.3X6X45X4                                                                       |                               |
| 1.5                                 | 0.3                             | 45                                 | 1.50                                 | 8.00                               | 4                                  | 1.44                            | 8.37                                                                                                                                                       | 8.65  | 8.95  | 9.28  | 10.01  | 441877    | 1433HPA                       | 1.5X.3X8X45X4                                                                       |                               |
| 1.5                                 | 0.3                             | 45                                 | 1.50                                 | 10.00                              | 4                                  | 1.44                            | 10.44                                                                                                                                                      | 10.79 | 11.17 | 11.58 | 12.49  | 441878    | 1433HPA                       | 1.5X.3X10X45X4                                                                      |                               |
| 1.5                                 | 0.3                             | 45                                 | 1.50                                 | 12.00                              | 4                                  | 1.44                            | 12.50                                                                                                                                                      | 12.93 | 13.39 | 13.88 | 14.98  | 441879    | 1433HPA                       | 1.5X.3X12X45X4                                                                      |                               |
| 1.5                                 | 0.3                             | 50                                 | 1.50                                 | 16.00                              | 4                                  | 1.44                            | 16.64                                                                                                                                                      | 17.21 | 17.82 | 18.48 | 19.95  | 441880    | 1433HPA                       | 1.5X.3X16X50X4                                                                      |                               |
| 1.5                                 | 0.3                             | 50                                 | 1.50                                 | 20.00                              | 4                                  | 1.44                            | 20.77                                                                                                                                                      | 21.49 | 22.25 | 23.08 | libero | 441881    | 1433HPA                       | 1.5X.3X20X50X4                                                                      |                               |
| 1.5                                 | 0.5                             | 45                                 | 1.50                                 | 3.00                               | 4                                  | 1.44                            | 3.19                                                                                                                                                       | 3.29  | 3.39  | 3.50  | 3.74   | 441882    | 1433HPA                       | 1.5X.5X3X45X4                                                                       |                               |
| 1.5                                 | 0.5                             | 45                                 | 1.50                                 | 4.00                               | 4                                  | 1.44                            | 4.23                                                                                                                                                       | 4.36  | 4.50  | 4.65  | 4.99   | 441883    | 1433HPA                       | 1.5X.5X4X45X4                                                                       |                               |
| 1.5                                 | 0.5                             | 45                                 | 1.50                                 | 6.00                               | 4                                  | 1.44                            | 6.30                                                                                                                                                       | 6.50  | 6.71  | 6.95  | 7.47   | 441884    | 1433HPA                       | 1.5X.5X6X45X4                                                                       |                               |
| 1.5                                 | 0.5                             | 45                                 | 1.50                                 | 8.00                               | 4                                  | 1.44                            | 8.36                                                                                                                                                       | 8.64  | 8.93  | 9.25  | 9.96   | 441885    | 1433HPA                       | 1.5X.5X8X45X4                                                                       |                               |
| 1.5                                 | 0.5                             | 45                                 | 1.50                                 | 10.00                              | 4                                  | 1.44                            | 10.43                                                                                                                                                      | 10.78 | 11.15 | 11.55 | 12.44  | 441886    | 1433HPA                       | 1.5X.5X10X45X4                                                                      |                               |
| 1.5                                 | 0.5                             | 45                                 | 1.50                                 | 12.00                              | 4                                  | 1.44                            | 12.50                                                                                                                                                      | 12.92 | 13.36 | 13.85 | 14.93  | 441885    | 1433HPA                       | 1.5X.5X12X45X4                                                                      |                               |
| 1.5                                 | 0.5                             | 50                                 | 1.50                                 | 16.00                              | 4                                  | 1.44                            | 16.63                                                                                                                                                      | 17.19 | 17.80 | 18.45 | 19.90  | 441887    | 1433HPA                       | 1.5X.5X16X50X4                                                                      |                               |
| 1.5                                 | 0.5                             | 50                                 | 1.50                                 | 20.00                              | 4                                  | 1.44                            | 20.77                                                                                                                                                      | 21.47 | 22.23 | 23.05 | libero | 441888    | 1433HPA                       | 1.5X.5X20X50X4                                                                      |                               |
| 2                                   | 0.05                            | 45                                 | 1.70                                 | 4.00                               | 4                                  | 1.92                            | 4.28                                                                                                                                                       | 4.43  | 4.59  | 4.76  | 5.14   | 441889    | 1433HPA                       | 2X.05X4X45X4                                                                        |                               |
| 2                                   | 0.05                            | 45                                 | 1.70                                 | 6.00                               | 4                                  | 1.92                            | 6.35                                                                                                                                                       | 6.57  | 6.80  | 7.06  | 7.63   | 441890    | 1433HPA                       | 2X.05X6X45X4                                                                        |                               |
| 2                                   | 0.05                            | 45                                 | 1.70                                 | 8.00                               | 4                                  | 1.92                            | 8.42                                                                                                                                                       | 8.71  | 9.02  | 9.36  | 10.11  | 441891    | 1433HPA                       | 2X.05X8X45X4                                                                        |                               |
| 2                                   | 0.05                            | 45                                 | 1.70                                 | 10.00                              | 4                                  | 1.92                            | 10.48                                                                                                                                                      | 10.85 | 11.24 | 11.66 | 12.60  | 441892    | 1433HPA                       | 2X.05X10X45X4                                                                       |                               |
| 2                                   | 0.05                            | 45                                 | 1.70                                 | 12.00                              | 4                                  | 1.92                            | 12.55                                                                                                                                                      | 12.99 | 13.45 | 13.96 | 15.09  | 441893    | 1433HPA                       | 2X.05X12X45X4                                                                       |                               |
| 2                                   | 0.05                            | 50                                 | 1.70                                 | 16.00                              | 4                                  | 1.92                            | 16.69                                                                                                                                                      | 17.27 | 17.89 | 18.56 | libero | 441894    | 1433HPA                       | 2X.05X16X50X4                                                                       |                               |
| 2                                   | 0.05                            | 50                                 | 1.70                                 | 20.00                              | 4                                  | 1.92                            | 20.82                                                                                                                                                      | 21.54 | 22.32 | 23.16 | libero | 441895    | 1433HPA                       | 2X.05X20X50X4                                                                       |                               |
| 2                                   | 0.1                             | 45                                 | 1.70                                 | 4.00                               | 4                                  | 1.92                            | 4.28                                                                                                                                                       | 4.43  | 4.58  | 4.75  | 5.13   | 441896    | 1433HPA                       | 2X.1X4X45X4                                                                         |                               |
| 2                                   | 0.1                             | 45                                 | 1.70                                 | 6.00                               | 4                                  | 1.92                            | 6.35                                                                                                                                                       | 6.57  | 6.80  | 7.05  | 7.62   | 441897    | 1433HPA                       | 2X.1X6X45X4                                                                         |                               |
| 2                                   | 0.1                             | 45                                 | 1.70                                 | 8.00                               | 4                                  | 1.92                            | 8.42                                                                                                                                                       | 8.71  | 9.02  | 9.35  | 10.10  | 441898    | 1433HPA                       | 2X.1X8X45X4                                                                         |                               |
| 2                                   | 0.1                             | 45                                 | 1.70                                 | 10.00                              | 4                                  | 1.92                            | 10.48                                                                                                                                                      | 10.84 | 11.23 | 11.65 | 12.59  | 441899    | 1433HPA                       | 2X.1X10X45X4                                                                        |                               |
| 2                                   | 0.1                             | 45                                 | 1.70                                 | 12.00                              | 4                                  | 1.92                            | 12.55                                                                                                                                                      | 12.98 | 13.45 | 13.95 | 15.07  | 441900    | 1433HPA                       | 2X.1X12X45X4                                                                        |                               |
| 2                                   | 0.1                             | 50                                 | 1.70                                 | 16.00                              | 4                                  | 1.92                            | 16.68                                                                                                                                                      | 17.26 | 17.88 | 18.55 | libero | 441901    | 1433HPA                       | 2X.1X16X50X4                                                                        |                               |
| 2                                   | 0.1                             | 50                                 | 1.70                                 | 20.00                              | 4                                  | 1.92                            | 20.82                                                                                                                                                      | 21.54 | 22.32 | 23.15 | libero | 441902    | 1433HPA                       | 2X.1X20X50X4                                                                        |                               |
| 2                                   | 0.2                             | 45                                 | 1.70                                 | 4.00                               | 4                                  | 1.92                            | 4.28                                                                                                                                                       | 4.42  | 4.57  | 4.74  | 5.10   | 441903    | 1433HPA                       | 2X.2X4X45X4                                                                         |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |        |        |        |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|--------|--------|
|                                     |                                 |                                    |                                      |                                    |                                    |                                 | 30°                                                                                                                                                        | 1°    | 1°30'  | 2°     | 3°     |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  |                                                                                                                                                            |       |        |        |        |
| 2                                   | 0.2                             | 45                                 | 1.70                                 | 6.00                               | 4                                  | 1.92                            | 6.34                                                                                                                                                       | 6.56  | 6.79   | 7.04   | 7.59   |
| 2                                   | 0.2                             | 45                                 | 1.70                                 | 8.00                               | 4                                  | 1.92                            | 8.41                                                                                                                                                       | 8.70  | 9.01   | 9.34   | 10.08  |
| 2                                   | 0.2                             | 45                                 | 1.70                                 | 10.00                              | 4                                  | 1.92                            | 10.48                                                                                                                                                      | 10.84 | 11.22  | 11.64  | 12.56  |
| 2                                   | 0.2                             | 45                                 | 1.70                                 | 12.00                              | 4                                  | 1.92                            | 12.55                                                                                                                                                      | 12.98 | 13.44  | 13.93  | 15.05  |
| 2                                   | 0.2                             | 50                                 | 1.70                                 | 16.00                              | 4                                  | 1.92                            | 16.68                                                                                                                                                      | 17.26 | 17.87  | 18.53  | libero |
| 2                                   | 0.2                             | 50                                 | 1.70                                 | 20.00                              | 4                                  | 1.92                            | 20.82                                                                                                                                                      | 21.53 | 22.31  | 23.13  | libero |
| 2                                   | 0.3                             | 45                                 | 1.70                                 | 4.00                               | 4                                  | 1.92                            | 4.27                                                                                                                                                       | 4.41  | 4.56   | 4.72   | 5.08   |
| 2                                   | 0.3                             | 45                                 | 1.70                                 | 6.00                               | 4                                  | 1.92                            | 6.34                                                                                                                                                       | 6.55  | 6.78   | 7.02   | 7.57   |
| 2                                   | 0.3                             | 45                                 | 1.70                                 | 8.00                               | 4                                  | 1.92                            | 8.41                                                                                                                                                       | 8.69  | 8.99   | 9.32   | 10.05  |
| 2                                   | 0.3                             | 45                                 | 1.70                                 | 10.00                              | 4                                  | 1.92                            | 10.48                                                                                                                                                      | 10.83 | 11.21  | 11.62  | 12.54  |
| 2                                   | 0.3                             | 45                                 | 1.70                                 | 12.00                              | 4                                  | 1.92                            | 12.54                                                                                                                                                      | 12.97 | 13.43  | 13.92  | 15.03  |
| 2                                   | 0.3                             | 50                                 | 1.70                                 | 16.00                              | 4                                  | 1.92                            | 16.68                                                                                                                                                      | 17.25 | 17.86  | 18.52  | libero |
| 2                                   | 0.3                             | 50                                 | 1.70                                 | 20.00                              | 4                                  | 1.92                            | 20.81                                                                                                                                                      | 21.53 | 22.29  | 23.12  | libero |
| 2                                   | 0.5                             | 45                                 | 1.70                                 | 4.00                               | 4                                  | 1.92                            | 4.27                                                                                                                                                       | 4.40  | 4.54   | 4.69   | 5.03   |
| 2                                   | 0.5                             | 45                                 | 1.70                                 | 6.00                               | 4                                  | 1.92                            | 6.33                                                                                                                                                       | 6.54  | 6.76   | 6.99   | 7.52   |
| 2                                   | 0.5                             | 45                                 | 1.70                                 | 8.00                               | 4                                  | 1.92                            | 8.40                                                                                                                                                       | 8.68  | 8.97   | 9.29   | 10.00  |
| 2                                   | 0.5                             | 45                                 | 1.70                                 | 10.00                              | 4                                  | 1.92                            | 10.47                                                                                                                                                      | 10.82 | 11.19  | 11.59  | 12.49  |
| 2                                   | 0.5                             | 45                                 | 1.70                                 | 12.00                              | 4                                  | 1.92                            | 12.54                                                                                                                                                      | 12.96 | 13.41  | 13.89  | 14.98  |
| 2                                   | 0.5                             | 50                                 | 1.70                                 | 16.00                              | 4                                  | 1.92                            | 16.67                                                                                                                                                      | 17.23 | 17.84  | 18.49  | libero |
| 2                                   | 0.5                             | 50                                 | 1.70                                 | 20.00                              | 4                                  | 1.92                            | 20.81                                                                                                                                                      | 21.51 | 22.27  | 23.09  | libero |
| 2.5                                 | 0.1                             | 45                                 | 2.00                                 | 10.00                              | 4                                  | 2.39                            | 10.54                                                                                                                                                      | 10.90 | 11.29  | 11.71  | 12.66  |
| 2.5                                 | 0.1                             | 50                                 | 2.00                                 | 20.00                              | 4                                  | 2.39                            | 20.88                                                                                                                                                      | 21.60 | 22.38  | libero | libero |
| 2.5                                 | 0.1                             | 70                                 | 2.00                                 | 30.00                              | 4                                  | 2.39                            | 31.21                                                                                                                                                      | 32.30 | libero | libero | libero |
| 2.5                                 | 0.2                             | 45                                 | 2.00                                 | 10.00                              | 4                                  | 2.39                            | 10.54                                                                                                                                                      | 10.90 | 11.28  | 11.70  | 12.63  |
| 2.5                                 | 0.2                             | 50                                 | 2.00                                 | 20.00                              | 4                                  | 2.39                            | 20.87                                                                                                                                                      | 21.59 | 22.37  | libero | libero |
| 2.5                                 | 0.2                             | 70                                 | 2.00                                 | 30.00                              | 4                                  | 2.39                            | 31.21                                                                                                                                                      | 32.29 | libero | libero | libero |
| 2.5                                 | 0.3                             | 45                                 | 2.00                                 | 10.00                              | 4                                  | 2.39                            | 10.53                                                                                                                                                      | 10.89 | 11.27  | 11.68  | 12.61  |
| 2.5                                 | 0.3                             | 50                                 | 2.00                                 | 20.00                              | 4                                  | 2.39                            | 20.87                                                                                                                                                      | 21.59 | 22.36  | libero | libero |
| 2.5                                 | 0.3                             | 70                                 | 2.00                                 | 30.00                              | 4                                  | 2.39                            | 31.21                                                                                                                                                      | 32.28 | libero | libero | libero |
| 2.5                                 | 0.5                             | 45                                 | 2.00                                 | 10.00                              | 4                                  | 2.39                            | 10.53                                                                                                                                                      | 10.88 | 11.25  | 11.65  | 12.56  |
| 2.5                                 | 0.5                             | 50                                 | 2.00                                 | 20.00                              | 4                                  | 2.39                            | 20.86                                                                                                                                                      | 21.57 | 22.33  | libero | libero |
| 2.5                                 | 0.5                             | 70                                 | 2.00                                 | 30.00                              | 4                                  | 2.39                            | 31.20                                                                                                                                                      | 32.27 | libero | libero | libero |
| 3                                   | 0.05                            | 50                                 | 4.00                                 | 4.00                               | 6                                  | 2.86                            | 4.40                                                                                                                                                       | 4.55  | 4.71   | 4.89   | 5.28   |
| 3                                   | 0.05                            | 50                                 | 4.00                                 | 6.00                               | 6                                  | 2.86                            | 6.47                                                                                                                                                       | 6.69  | 6.93   | 7.19   | 7.77   |
| 3                                   | 0.05                            | 50                                 | 4.00                                 | 8.00                               | 6                                  | 2.86                            | 8.53                                                                                                                                                       | 8.83  | 9.15   | 9.49   | 10.25  |
| 3                                   | 0.05                            | 50                                 | 4.00                                 | 10.00                              | 6                                  | 2.86                            | 10.60                                                                                                                                                      | 10.97 | 11.36  | 11.79  | 12.74  |
| 3                                   | 0.05                            | 50                                 | 4.00                                 | 12.00                              | 6                                  | 2.86                            | 12.67                                                                                                                                                      | 13.11 | 13.58  | 14.09  | 15.23  |
| 3                                   | 0.05                            | 60                                 | 4.00                                 | 16.00                              | 6                                  | 2.86                            | 16.80                                                                                                                                                      | 17.39 | 18.01  | 18.69  | 20.20  |
| 3                                   | 0.05                            | 60                                 | 4.00                                 | 20.00                              | 6                                  | 2.86                            | 20.94                                                                                                                                                      | 21.66 | 22.45  | 23.29  | 25.17  |

| 1433HPA   |                               |                                                                                     |                               |
|-----------|-------------------------------|-------------------------------------------------------------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code |  | Prezzo utensile<br>Tool Price |
|           |                               |                                                                                     | €                             |
| 441904    | 1433HPA                       | 2X.2X6X45X4                                                                         |                               |
| 441905    | 1433HPA                       | 2X.2X8X45X4                                                                         |                               |
| 441906    | 1433HPA                       | 2X.2X10X45X4                                                                        |                               |
| 441907    | 1433HPA                       | 2X.2X12X45X4                                                                        |                               |
| 441908    | 1433HPA                       | 2X.2X16X50X4                                                                        |                               |
| 441909    | 1433HPA                       | 2X.2X20X50X4                                                                        |                               |
| 441910    | 1433HPA                       | 2X.3X4X45X4                                                                         |                               |
| 441911    | 1433HPA                       | 2X.3X6X45X4                                                                         |                               |
| 441912    | 1433HPA                       | 2X.3X8X45X4                                                                         |                               |
| 441913    | 1433HPA                       | 2X.3X10X45X4                                                                        |                               |
| 441914    | 1433HPA                       | 2X.3X12X45X4                                                                        |                               |
| 441915    | 1433HPA                       | 2X.3X16X50X4                                                                        |                               |
| 441916    | 1433HPA                       | 2X.3X20X50X4                                                                        |                               |
| 441917    | 1433HPA                       | 2X.5X4X45X4                                                                         |                               |
| 441918    | 1433HPA                       | 2X.5X6X45X4                                                                         |                               |
| 441919    | 1433HPA                       | 2X.5X8X45X4                                                                         |                               |
| 441920    | 1433HPA                       | 2X.5X10X45X4                                                                        |                               |
| 441921    | 1433HPA                       | 2X.5X12X45X4                                                                        |                               |
| 441922    | 1433HPA                       | 2X.5X16X50X4                                                                        |                               |
| 441923    | 1433HPA                       | 2X.5X20X50X4                                                                        |                               |
| 441924    | 1433HPA                       | 2.5X.1X10X45X4                                                                      |                               |
| 441925    | 1433HPA                       | 2.5X.1X20X50X4                                                                      |                               |
| 441926    | 1433HPA                       | 2.5X.1X30X70X4                                                                      |                               |
| 441927    | 1433HPA                       | 2.5X.2X10X45X4                                                                      |                               |
| 441928    | 1433HPA                       | 2.5X.2X20X50X4                                                                      |                               |
| 441929    | 1433HPA                       | 2.5X.2X30X70X4                                                                      |                               |
| 441930    | 1433HPA                       | 2.5X.3X10X45X4                                                                      |                               |
| 441931    | 1433HPA                       | 2.5X.3X20X50X4                                                                      |                               |
| 441932    | 1433HPA                       | 2.5X.3X30X70X4                                                                      |                               |
| 441933    | 1433HPA                       | 2.5X.5X10X45X4                                                                      |                               |
| 441934    | 1433HPA                       | 2.5X.5X20X50X4                                                                      |                               |
| 441935    | 1433HPA                       | 2.5X.5X30X70X4                                                                      |                               |
| 441936    | 1433HPA                       | 3X.05X4X50X6                                                                        |                               |
| 441937    | 1433HPA                       | 3X.05X6X50X6                                                                        |                               |
| 441938    | 1433HPA                       | 3X.05X8X50X6                                                                        |                               |
| 441939    | 1433HPA                       | 3X.05X10X50X6                                                                       |                               |
| 441940    | 1433HPA                       | 3X.05X12X50X6                                                                       |                               |
| 441941    | 1433HPA                       | 3X.05X16X60X6                                                                       |                               |
| 441942    | 1433HPA                       | 3X.05X20X60X6                                                                       |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page &gt;&gt;

 Per Acciai Temprati ≤55 HRC  
For Hardened Steels ≤55 HRC

Frese toriche con scarico in metallo duro integrale micrograna.  
Corner radius long neck end mills in solid carbide micro grain.

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |       |       |        | 1433HPA   |                               |              | Prezzo utensile<br>Tool Price |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|--------|-----------|-------------------------------|--------------|-------------------------------|
|                                     |                                 |                                    |                                      |                                    |                                    |                                 | 30°                                                                                                                                                        | 1°    | 1°30' | 2°    | 3°     | ART. NUM. | Codice d'ordine<br>Order code |              |                               |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  |                                                                                                                                                            |       |       |       |        |           |                               |              | €                             |
| 3                                   | 0.1                             | 50                                 | 4.00                                 | 4.00                               | 6                                  | 2.86                            | 4.40                                                                                                                                                       | 4.55  | 4.71  | 4.88  | 5.27   | 441943    | 1433HPA                       | 3X.1X4X50X6  |                               |
| 3                                   | 0.1                             | 50                                 | 4.00                                 | 6.00                               | 6                                  | 2.86                            | 6.46                                                                                                                                                       | 6.69  | 6.92  | 7.18  | 7.75   | 441944    | 1433HPA                       | 3X.1X6X50X6  |                               |
| 3                                   | 0.1                             | 50                                 | 4.00                                 | 8.00                               | 6                                  | 2.86                            | 8.53                                                                                                                                                       | 8.82  | 9.14  | 9.48  | 10.24  | 441945    | 1433HPA                       | 3X.1X8X50X6  |                               |
| 3                                   | 0.1                             | 50                                 | 4.00                                 | 10.00                              | 6                                  | 2.86                            | 10.60                                                                                                                                                      | 10.96 | 11.36 | 11.78 | 12.73  | 441946    | 1433HPA                       | 3X.1X10X50X6 |                               |
| 3                                   | 0.1                             | 50                                 | 4.00                                 | 12.00                              | 6                                  | 2.86                            | 12.67                                                                                                                                                      | 13.10 | 13.57 | 14.08 | 15.21  | 441947    | 1433HPA                       | 3X.1X12X50X6 |                               |
| 3                                   | 0.1                             | 60                                 | 4.00                                 | 16.00                              | 6                                  | 2.86                            | 16.80                                                                                                                                                      | 17.38 | 18.01 | 18.68 | 20.19  | 441948    | 1433HPA                       | 3X.1X16X60X6 |                               |
| 3                                   | 0.1                             | 60                                 | 4.00                                 | 20.00                              | 6                                  | 2.86                            | 20.93                                                                                                                                                      | 21.66 | 22.44 | 23.28 | 25.16  | 441949    | 1433HPA                       | 3X.1X20X60X6 |                               |
| 3                                   | 0.1                             | 60                                 | 4.00                                 | 25.00                              | 6                                  | 2.86                            | 26.10                                                                                                                                                      | 27.01 | 27.98 | 29.03 | libero | 441950    | 1433HPA                       | 3X.1X25X60X6 |                               |
| 3                                   | 0.1                             | 70                                 | 4.00                                 | 30.00                              | 6                                  | 2.86                            | 31.27                                                                                                                                                      | 32.36 | 33.52 | 34.78 | libero | 441951    | 1433HPA                       | 3X.1X30X70X6 |                               |
| 3                                   | 0.1                             | 70                                 | 4.00                                 | 35.00                              | 6                                  | 2.86                            | 36.44                                                                                                                                                      | 37.71 | 39.06 | 40.53 | libero | 441952    | 1433HPA                       | 3X.1X35X70X6 |                               |
| 3                                   | 0.2                             | 50                                 | 4.00                                 | 4.00                               | 6                                  | 2.86                            | 4.39                                                                                                                                                       | 4.54  | 4.70  | 4.86  | 5.24   | 441953    | 1433HPA                       | 3X.2X4X50X6  |                               |
| 3                                   | 0.2                             | 50                                 | 4.00                                 | 6.00                               | 6                                  | 2.86                            | 6.46                                                                                                                                                       | 6.68  | 6.91  | 7.16  | 7.73   | 441954    | 1433HPA                       | 3X.2X6X50X6  |                               |
| 3                                   | 0.2                             | 50                                 | 4.00                                 | 8.00                               | 6                                  | 2.86                            | 8.53                                                                                                                                                       | 8.82  | 9.13  | 9.46  | 10.22  | 441955    | 1433HPA                       | 3X.2X8X50X6  |                               |
| 3                                   | 0.2                             | 50                                 | 4.00                                 | 10.00                              | 6                                  | 2.86                            | 10.59                                                                                                                                                      | 10.96 | 11.35 | 11.76 | 12.70  | 441956    | 1433HPA                       | 3X.2X10X50X6 |                               |
| 3                                   | 0.2                             | 50                                 | 4.00                                 | 12.00                              | 6                                  | 2.86                            | 12.66                                                                                                                                                      | 13.10 | 13.56 | 14.06 | 15.19  | 441957    | 1433HPA                       | 3X.2X12X50X6 |                               |
| 3                                   | 0.2                             | 60                                 | 4.00                                 | 16.00                              | 6                                  | 2.86                            | 16.80                                                                                                                                                      | 17.38 | 18.00 | 18.66 | 20.16  | 441958    | 1433HPA                       | 3X.2X16X60X6 |                               |
| 3                                   | 0.2                             | 60                                 | 4.00                                 | 20.00                              | 6                                  | 2.86                            | 20.93                                                                                                                                                      | 21.65 | 22.43 | 23.26 | 25.13  | 441959    | 1433HPA                       | 3X.2X20X60X6 |                               |
| 3                                   | 0.2                             | 60                                 | 4.00                                 | 25.00                              | 6                                  | 2.86                            | 26.10                                                                                                                                                      | 27.00 | 27.97 | 29.01 | libero | 441960    | 1433HPA                       | 3X.2X25X60X6 |                               |
| 3                                   | 0.2                             | 70                                 | 4.00                                 | 30.00                              | 6                                  | 2.86                            | 31.27                                                                                                                                                      | 32.35 | 33.51 | 34.76 | libero | 441961    | 1433HPA                       | 3X.2X30X70X6 |                               |
| 3                                   | 0.2                             | 70                                 | 4.00                                 | 35.00                              | 6                                  | 2.86                            | 36.44                                                                                                                                                      | 37.70 | 39.05 | 40.51 | libero | 441962    | 1433HPA                       | 3X.2X35X70X6 |                               |
| 3                                   | 0.3                             | 50                                 | 4.00                                 | 4.00                               | 6                                  | 2.86                            | 4.39                                                                                                                                                       | 4.53  | 4.69  | 4.85  | 5.22   | 441963    | 1433HPA                       | 3X.3X4X50X6  |                               |
| 3                                   | 0.3                             | 50                                 | 4.00                                 | 6.00                               | 6                                  | 2.86                            | 6.46                                                                                                                                                       | 6.67  | 6.90  | 7.15  | 7.71   | 441964    | 1433HPA                       | 3X.3X6X50X6  |                               |
| 3                                   | 0.3                             | 50                                 | 4.00                                 | 8.00                               | 6                                  | 2.86                            | 8.52                                                                                                                                                       | 8.81  | 9.12  | 9.45  | 10.19  | 441965    | 1433HPA                       | 3X.3X8X50X6  |                               |
| 3                                   | 0.3                             | 50                                 | 4.00                                 | 10.00                              | 6                                  | 2.86                            | 10.59                                                                                                                                                      | 10.95 | 11.34 | 11.75 | 12.68  | 441966    | 1433HPA                       | 3X.3X10X50X6 |                               |
| 3                                   | 0.3                             | 50                                 | 4.00                                 | 12.00                              | 6                                  | 2.86                            | 12.66                                                                                                                                                      | 13.09 | 13.55 | 14.05 | 15.16  | 441967    | 1433HPA                       | 3X.3X12X50X6 |                               |
| 3                                   | 0.3                             | 60                                 | 4.00                                 | 16.00                              | 6                                  | 2.86                            | 16.79                                                                                                                                                      | 17.37 | 17.99 | 18.65 | 20.14  | 441968    | 1433HPA                       | 3X.3X16X60X6 |                               |
| 3                                   | 0.3                             | 60                                 | 4.00                                 | 20.00                              | 6                                  | 2.86                            | 20.93                                                                                                                                                      | 21.65 | 22.42 | 23.25 | 25.11  | 441969    | 1433HPA                       | 3X.3X20X60X6 |                               |
| 3                                   | 0.3                             | 60                                 | 4.00                                 | 25.00                              | 6                                  | 2.86                            | 26.10                                                                                                                                                      | 27.00 | 27.96 | 29.00 | libero | 441970    | 1433HPA                       | 3X.3X25X60X6 |                               |
| 3                                   | 0.3                             | 70                                 | 4.00                                 | 30.00                              | 6                                  | 2.86                            | 31.26                                                                                                                                                      | 32.34 | 33.50 | 34.75 | libero | 441971    | 1433HPA                       | 3X.3X30X70X6 |                               |
| 3                                   | 0.3                             | 70                                 | 4.00                                 | 35.00                              | 6                                  | 2.86                            | 36.43                                                                                                                                                      | 37.69 | 39.04 | 40.50 | libero | 441972    | 1433HPA                       | 3X.3X35X70X6 |                               |
| 3                                   | 0.5                             | 50                                 | 4.00                                 | 4.00                               | 6                                  | 2.86                            | 4.38                                                                                                                                                       | 4.52  | 4.66  | 4.82  | 5.17   | 441973    | 1433HPA                       | 3X.5X4X50X6  |                               |
| 3                                   | 0.5                             | 50                                 | 4.00                                 | 6.00                               | 6                                  | 2.86                            | 6.45                                                                                                                                                       | 6.66  | 6.88  | 7.12  | 7.66   | 441974    | 1433HPA                       | 3X.5X6X50X6  |                               |
| 3                                   | 0.5                             | 50                                 | 4.00                                 | 8.00                               | 6                                  | 2.86                            | 8.52                                                                                                                                                       | 8.80  | 9.10  | 9.42  | 10.14  | 441975    | 1433HPA                       | 3X.5X8X50X6  |                               |
| 3                                   | 0.5                             | 50                                 | 4.00                                 | 10.00                              | 6                                  | 2.86                            | 10.58                                                                                                                                                      | 10.94 | 11.31 | 11.72 | 12.63  | 441976    | 1433HPA                       | 3X.5X10X50X6 |                               |
| 3                                   | 0.5                             | 50                                 | 4.00                                 | 12.00                              | 6                                  | 2.86                            | 12.65                                                                                                                                                      | 13.08 | 13.53 | 14.02 | 15.12  | 441977    | 1433HPA                       | 3X.5X12X50X6 |                               |
| 3                                   | 0.5                             | 60                                 | 4.00                                 | 16.00                              | 6                                  | 2.86                            | 16.79                                                                                                                                                      | 17.35 | 17.96 | 18.62 | 20.09  | 441978    | 1433HPA                       | 3X.5X16X60X6 |                               |
| 3                                   | 0.5                             | 60                                 | 4.00                                 | 20.00                              | 6                                  | 2.86                            | 20.92                                                                                                                                                      | 21.63 | 22.40 | 23.22 | 25.06  | 441979    | 1433HPA                       | 3X.5X20X60X6 |                               |
| 3                                   | 0.5                             | 60                                 | 4.00                                 | 25.00                              | 6                                  | 2.86                            | 26.09                                                                                                                                                      | 26.98 | 27.94 | 28.97 | libero | 441980    | 1433HPA                       | 3X.5X25X60X6 |                               |
| 3                                   | 0.5                             | 70                                 | 4.00                                 | 30.00                              | 6                                  | 2.86                            | 31.26                                                                                                                                                      | 32.33 | 33.48 | 34.72 | libero | 441981    | 1433HPA                       | 3X.5X30X70X6 |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |        |        |        | 1433HPA   |                               |            | Prezzo utensile<br>Tool Price |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|--------|--------|-----------|-------------------------------|------------|-------------------------------|
|                                     |                                 |                                    |                                      |                                    |                                    |                                 | 30°                                                                                                                                                        | 1°    | 1°30'  | 2°     | 3°     | ART. NUM. | Codice d'ordine<br>Order code | HA<br>6535 |                               |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  |                                                                                                                                                            |       |        |        |        |           |                               |            | €                             |
| 3                                   | 0.5                             | 70                                 | 4.00                                 | 35.00                              | 6                                  | 2.86                            | 36.43                                                                                                                                                      | 37.68 | 39.02  | 40.47  | libero | 441982    | 1433HPA 3X.5X35X70X6          |            |                               |
| 3                                   | 1.0                             | 50                                 | 4.00                                 | 8.00                               | 6                                  | 2.86                            | 8.50                                                                                                                                                       | 8.76  | 9.04   | 9.34   | 10.02  | 441983    | 1433HPA 3X1X8X50X6            |            |                               |
| 3                                   | 1.0                             | 50                                 | 4.00                                 | 10.00                              | 6                                  | 2.86                            | 10.57                                                                                                                                                      | 10.90 | 11.26  | 11.64  | 12.51  | 441984    | 1433HPA 3X1X10X50X6           |            |                               |
| 3                                   | 1.0                             | 50                                 | 4.00                                 | 12.00                              | 6                                  | 2.86                            | 12.64                                                                                                                                                      | 13.04 | 13.48  | 13.94  | 14.99  | 441985    | 1433HPA 3X1X12X50X6           |            |                               |
| 3                                   | 1.0                             | 60                                 | 4.00                                 | 16.00                              | 6                                  | 2.86                            | 16.77                                                                                                                                                      | 17.32 | 17.91  | 18.54  | 19.97  | 441986    | 1433HPA 3X1X16X60X6           |            |                               |
| 3                                   | 1.0                             | 60                                 | 4.00                                 | 20.00                              | 6                                  | 2.86                            | 20.90                                                                                                                                                      | 21.60 | 22.34  | 23.14  | 24.94  | 441987    | 1433HPA 3X1X20X60X6           |            |                               |
| 3                                   | 1.0                             | 60                                 | 4.00                                 | 25.00                              | 6                                  | 2.86                            | 26.07                                                                                                                                                      | 26.95 | 27.88  | 28.89  | libero | 441988    | 1433HPA 3X1X25X60X6           |            |                               |
| 3                                   | 1.0                             | 70                                 | 4.00                                 | 30.00                              | 6                                  | 2.86                            | 31.24                                                                                                                                                      | 32.30 | 33.43  | 34.64  | libero | 441989    | 1433HPA 3X1X30X70X6           |            |                               |
| 3                                   | 1.0                             | 70                                 | 4.00                                 | 35.00                              | 6                                  | 2.86                            | 36.41                                                                                                                                                      | 37.64 | 38.97  | 40.39  | libero | 441990    | 1433HPA 3X1X35X70X6           |            |                               |
| 4                                   | 0.1                             | 50                                 | 5.00                                 | 8.00                               | 6                                  | 3.80                            | 8.65                                                                                                                                                       | 8.94  | 9.26   | 9.61   | 10.38  | 441991    | 1433HPA 4X.1X8X50X6           |            |                               |
| 4                                   | 0.1                             | 50                                 | 5.00                                 | 10.00                              | 6                                  | 3.80                            | 10.71                                                                                                                                                      | 11.08 | 11.48  | 11.91  | 12.87  | 441992    | 1433HPA 4X.1X10X50X6          |            |                               |
| 4                                   | 0.1                             | 50                                 | 5.00                                 | 12.00                              | 6                                  | 3.80                            | 12.78                                                                                                                                                      | 13.22 | 13.70  | 14.21  | 15.35  | 441993    | 1433HPA 4X.1X12X50X6          |            |                               |
| 4                                   | 0.1                             | 60                                 | 5.00                                 | 16.00                              | 6                                  | 3.80                            | 16.92                                                                                                                                                      | 17.50 | 18.13  | 18.81  | libero | 441994    | 1433HPA 4X.1X16X60X6          |            |                               |
| 4                                   | 0.1                             | 60                                 | 5.00                                 | 20.00                              | 6                                  | 3.80                            | 21.05                                                                                                                                                      | 21.78 | 22.56  | 23.41  | libero | 441995    | 1433HPA 4X.1X20X60X6          |            |                               |
| 4                                   | 0.1                             | 60                                 | 5.00                                 | 25.00                              | 6                                  | 3.80                            | 26.22                                                                                                                                                      | 27.13 | 28.11  | libero | libero | 441996    | 1433HPA 4X.1X25X60X6          |            |                               |
| 4                                   | 0.1                             | 70                                 | 5.00                                 | 30.00                              | 6                                  | 3.80                            | 31.39                                                                                                                                                      | 32.48 | 33.65  | libero | libero | 441997    | 1433HPA 4X.1X30X70X6          |            |                               |
| 4                                   | 0.1                             | 80                                 | 5.00                                 | 40.00                              | 6                                  | 3.80                            | 41.72                                                                                                                                                      | 43.17 | libero | libero | libero | 441998    | 1433HPA 4X.1X40X80X6          |            |                               |
| 4                                   | 0.2                             | 50                                 | 5.00                                 | 8.00                               | 6                                  | 3.80                            | 8.64                                                                                                                                                       | 8.94  | 9.25   | 9.59   | 10.36  | 441999    | 1433HPA 4X.2X8X50X6           |            |                               |
| 4                                   | 0.2                             | 50                                 | 5.00                                 | 10.00                              | 6                                  | 3.80                            | 10.71                                                                                                                                                      | 11.08 | 11.47  | 11.89  | 12.84  | 442000    | 1433HPA 4X.2X10X50X6          |            |                               |
| 4                                   | 0.2                             | 50                                 | 5.00                                 | 12.00                              | 6                                  | 3.80                            | 12.78                                                                                                                                                      | 13.22 | 13.69  | 14.19  | 15.33  | 442001    | 1433HPA 4X.2X12X50X6          |            |                               |
| 4                                   | 0.2                             | 60                                 | 5.00                                 | 16.00                              | 6                                  | 3.80                            | 16.91                                                                                                                                                      | 17.50 | 18.12  | 18.79  | libero | 442002    | 1433HPA 4X.2X16X60X6          |            |                               |
| 4                                   | 0.2                             | 60                                 | 5.00                                 | 20.00                              | 6                                  | 3.80                            | 21.05                                                                                                                                                      | 21.77 | 22.55  | 23.39  | libero | 442003    | 1433HPA 4X.2X20X60X6          |            |                               |
| 4                                   | 0.2                             | 60                                 | 5.00                                 | 25.00                              | 6                                  | 3.80                            | 26.22                                                                                                                                                      | 27.12 | 28.09  | libero | libero | 442004    | 1433HPA 4X.2X25X60X6          |            |                               |
| 4                                   | 0.2                             | 70                                 | 5.00                                 | 30.00                              | 6                                  | 3.80                            | 31.38                                                                                                                                                      | 32.47 | 33.64  | libero | libero | 442005    | 1433HPA 4X.2X30X70X6          |            |                               |
| 4                                   | 0.2                             | 80                                 | 5.00                                 | 40.00                              | 6                                  | 3.80                            | 41.72                                                                                                                                                      | 43.17 | libero | libero | libero | 442006    | 1433HPA 4X.2X40X80X6          |            |                               |
| 4                                   | 0.3                             | 50                                 | 5.00                                 | 8.00                               | 6                                  | 3.80                            | 8.64                                                                                                                                                       | 8.93  | 9.24   | 9.58   | 10.33  | 442007    | 1433HPA 4X.3X8X50X6           |            |                               |
| 4                                   | 0.3                             | 50                                 | 5.00                                 | 10.00                              | 6                                  | 3.80                            | 10.71                                                                                                                                                      | 11.07 | 11.46  | 11.88  | 12.82  | 442008    | 1433HPA 4X.3X10X50X6          |            |                               |
| 4                                   | 0.3                             | 50                                 | 5.00                                 | 12.00                              | 6                                  | 3.80                            | 12.77                                                                                                                                                      | 13.21 | 13.68  | 14.18  | 15.30  | 442009    | 1433HPA 4X.3X12X50X6          |            |                               |
| 4                                   | 0.3                             | 60                                 | 5.00                                 | 16.00                              | 6                                  | 3.80                            | 16.91                                                                                                                                                      | 17.49 | 18.11  | 18.78  | libero | 442010    | 1433HPA 4X.3X16X60X6          |            |                               |
| 4                                   | 0.3                             | 60                                 | 5.00                                 | 20.00                              | 6                                  | 3.80                            | 21.04                                                                                                                                                      | 21.77 | 22.54  | 23.38  | libero | 442011    | 1433HPA 4X.3X20X60X6          |            |                               |
| 4                                   | 0.3                             | 60                                 | 5.00                                 | 25.00                              | 6                                  | 3.80                            | 26.21                                                                                                                                                      | 27.12 | 28.08  | libero | libero | 442012    | 1433HPA 4X.3X25X60X6          |            |                               |
| 4                                   | 0.3                             | 70                                 | 5.00                                 | 30.00                              | 6                                  | 3.80                            | 31.38                                                                                                                                                      | 32.46 | 33.63  | libero | libero | 442013    | 1433HPA 4X.3X30X70X6          |            |                               |
| 4                                   | 0.3                             | 80                                 | 5.00                                 | 40.00                              | 6                                  | 3.80                            | 41.72                                                                                                                                                      | 43.16 | libero | libero | libero | 442014    | 1433HPA 4X.3X40X80X6          |            |                               |
| 4                                   | 0.5                             | 50                                 | 5.00                                 | 8.00                               | 6                                  | 3.80                            | 8.63                                                                                                                                                       | 8.92  | 9.22   | 9.55   | 10.28  | 442015    | 1433HPA 4X.5X8X50X6           |            |                               |
| 4                                   | 0.5                             | 50                                 | 5.00                                 | 10.00                              | 6                                  | 3.80                            | 10.70                                                                                                                                                      | 11.06 | 11.44  | 11.85  | 12.77  | 442016    | 1433HPA 4X.5X10X50X6          |            |                               |
| 4                                   | 0.5                             | 50                                 | 5.00                                 | 12.00                              | 6                                  | 3.80                            | 12.77                                                                                                                                                      | 13.20 | 13.65  | 14.15  | 15.26  | 442017    | 1433HPA 4X.5X12X50X6          |            |                               |
| 4                                   | 0.5                             | 60                                 | 5.00                                 | 16.00                              | 6                                  | 3.80                            | 16.90                                                                                                                                                      | 17.47 | 18.09  | 18.75  | libero | 442018    | 1433HPA 4X.5X16X60X6          |            |                               |
| 4                                   | 0.5                             | 60                                 | 5.00                                 | 20.00                              | 6                                  | 3.80                            | 21.04                                                                                                                                                      | 21.75 | 22.52  | 23.35  | libero | 442019    | 1433HPA 4X.5X20X60X6          |            |                               |
| 4                                   | 0.5                             | 60                                 | 5.00                                 | 25.00                              | 6                                  | 3.80                            | 26.21                                                                                                                                                      | 27.10 | 28.06  | 29.10  | libero | 442020    | 1433HPA 4X.5X25X60X6          |            |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page &gt;&gt;

 Per Acciai Temprati ≤55 HRC  
For Hardened Steels ≤55 HRC

Frese toriche con scarico in metallo duro integrale micrograna.  
Corner radius long neck end mills in solid carbide micro grain.

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |        |        |        |        | 1433HPA   |                               |              | Prezzo utensile<br>Tool Price |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--------|--------|-----------|-------------------------------|--------------|-------------------------------|
|                                     |                                 |                                    |                                      |                                    |                                    |                                 | 30°                                                                                                                                                        | 1°     | 1°30'  | 2°     | 3°     | ART. NUM. | Codice d'ordine<br>Order code |              |                               |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  |                                                                                                                                                            |        |        |        |        |           |                               |              | €                             |
| 4                                   | 0.5                             | 70                                 | 5.00                                 | 30.00                              | 6                                  | 3.80                            | 31.37                                                                                                                                                      | 32.45  | 33.60  | libero | libero | 442021    | 1433HPA                       | 4X.5X30X70X6 |                               |
| 4                                   | 0.5                             | 80                                 | 5.00                                 | 40.00                              | 6                                  | 3.80                            | 41.71                                                                                                                                                      | 43.15  | libero | libero | libero | 442022    | 1433HPA                       | 4X.5X40X80X6 |                               |
| 4                                   | 1.0                             | 50                                 | 5.00                                 | 8.00                               | 6                                  | 3.80                            | 8.62                                                                                                                                                       | 8.88   | 9.17   | 9.47   | 10.16  | 442023    | 1433HPA                       | 4X1X8X50X6   |                               |
| 4                                   | 1.0                             | 50                                 | 5.00                                 | 10.00                              | 6                                  | 3.80                            | 10.68                                                                                                                                                      | 11.02  | 11.38  | 11.77  | 12.65  | 442024    | 1433HPA                       | 4X1X10X50X6  |                               |
| 4                                   | 1.0                             | 50                                 | 5.00                                 | 12.00                              | 6                                  | 3.80                            | 12.75                                                                                                                                                      | 13.16  | 13.60  | 14.07  | 15.13  | 442025    | 1433HPA                       | 4X1X12X50X6  |                               |
| 4                                   | 1.0                             | 60                                 | 5.00                                 | 16.00                              | 6                                  | 3.80                            | 16.89                                                                                                                                                      | 17.44  | 18.03  | 18.67  | libero | 442026    | 1433HPA                       | 4X1X16X60X6  |                               |
| 4                                   | 1.0                             | 60                                 | 5.00                                 | 20.00                              | 6                                  | 3.80                            | 21.02                                                                                                                                                      | 21.72  | 22.47  | 23.27  | libero | 442027    | 1433HPA                       | 4X1X20X60X6  |                               |
| 4                                   | 1.0                             | 60                                 | 5.00                                 | 25.00                              | 6                                  | 3.80                            | 26.19                                                                                                                                                      | 27.07  | 28.01  | 29.02  | libero | 442028    | 1433HPA                       | 4X1X25X60X6  |                               |
| 4                                   | 1.0                             | 70                                 | 5.00                                 | 30.00                              | 6                                  | 3.80                            | 31.36                                                                                                                                                      | 32.42  | 33.55  | libero | libero | 442029    | 1433HPA                       | 4X1X30X70X6  |                               |
| 4                                   | 1.0                             | 80                                 | 5.00                                 | 40.00                              | 6                                  | 3.80                            | 41.69                                                                                                                                                      | 43.11  | libero | libero | libero | 442030    | 1433HPA                       | 4X1X40X80X6  |                               |
| 5                                   | 0.1                             | 60                                 | 4.00                                 | 20.00                              | 6                                  | 4.75                            | 21.15                                                                                                                                                      | 21.88  | libero | libero | libero | 442345    | 1433HPA                       | 5X.1X20X60X6 |                               |
| 5                                   | 0.1                             | 80                                 | 4.00                                 | 40.00                              | 6                                  | 4.75                            | 41.82                                                                                                                                                      | libero | libero | libero | libero | 442346    | 1433HPA                       | 5X.1X40X80X6 |                               |
| 5                                   | 0.2                             | 60                                 | 4.00                                 | 20.00                              | 6                                  | 4.75                            | 21.14                                                                                                                                                      | 21.87  | libero | libero | libero | 442033    | 1433HPA                       | 5X.2X20X60X6 |                               |
| 5                                   | 0.2                             | 80                                 | 4.00                                 | 40.00                              | 6                                  | 4.75                            | 41.82                                                                                                                                                      | libero | libero | libero | libero | 442034    | 1433HPA                       | 5X.2X40X80X6 |                               |
| 5                                   | 0.3                             | 60                                 | 4.00                                 | 20.00                              | 6                                  | 4.75                            | 21.14                                                                                                                                                      | 21.87  | libero | libero | libero | 442035    | 1433HPA                       | 5X.3X20X60X6 |                               |
| 5                                   | 0.3                             | 80                                 | 4.00                                 | 40.00                              | 6                                  | 4.75                            | 41.81                                                                                                                                                      | libero | libero | libero | libero | 442036    | 1433HPA                       | 5X.3X40X80X6 |                               |
| 5                                   | 0.5                             | 60                                 | 4.00                                 | 20.00                              | 6                                  | 4.75                            | 21.13                                                                                                                                                      | 21.85  | libero | libero | libero | 442037    | 1433HPA                       | 5X.5X20X60X6 |                               |
| 5                                   | 0.5                             | 80                                 | 4.00                                 | 40.00                              | 6                                  | 4.75                            | 41.81                                                                                                                                                      | libero | libero | libero | libero | 442038    | 1433HPA                       | 5X.5X40X80X6 |                               |
| 5                                   | 1.0                             | 60                                 | 4.00                                 | 20.00                              | 6                                  | 4.75                            | 21.12                                                                                                                                                      | 21.82  | libero | libero | libero | 442031    | 1433HPA                       | 5X1X20X60X6  |                               |
| 5                                   | 1.0                             | 80                                 | 4.00                                 | 40.00                              | 6                                  | 4.75                            | 41.79                                                                                                                                                      | libero | libero | libero | libero | 442032    | 1433HPA                       | 5X1X40X80X6  |                               |
| 6                                   | 0.1                             | 50                                 | 8.00                                 | 12.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442039    | 1433HPA                       | 6X.1X12X50X6 |                               |
| 6                                   | 0.1                             | 60                                 | 8.00                                 | 16.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442040    | 1433HPA                       | 6X.1X16X60X6 |                               |
| 6                                   | 0.1                             | 60                                 | 8.00                                 | 20.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442041    | 1433HPA                       | 6X.1X20X60X6 |                               |
| 6                                   | 0.1                             | 70                                 | 8.00                                 | 30.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442042    | 1433HPA                       | 6X.1X30X70X6 |                               |
| 6                                   | 0.2                             | 50                                 | 8.00                                 | 12.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442043    | 1433HPA                       | 6X.2X12X50X6 |                               |
| 6                                   | 0.2                             | 60                                 | 8.00                                 | 16.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442044    | 1433HPA                       | 6X.2X16X60X6 |                               |
| 6                                   | 0.2                             | 60                                 | 8.00                                 | 20.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442045    | 1433HPA                       | 6X.2X20X60X6 |                               |
| 6                                   | 0.2                             | 70                                 | 8.00                                 | 30.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442046    | 1433HPA                       | 6X.2X30X70X6 |                               |
| 6                                   | 0.3                             | 50                                 | 8.00                                 | 12.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442047    | 1433HPA                       | 6X.3X12X50X6 |                               |
| 6                                   | 0.3                             | 60                                 | 8.00                                 | 16.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442048    | 1433HPA                       | 6X.3X16X60X6 |                               |
| 6                                   | 0.3                             | 60                                 | 8.00                                 | 20.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442049    | 1433HPA                       | 6X.3X20X60X6 |                               |
| 6                                   | 0.3                             | 70                                 | 8.00                                 | 30.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442050    | 1433HPA                       | 6X.3X30X70X6 |                               |
| 6                                   | 0.5                             | 50                                 | 8.00                                 | 12.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442051    | 1433HPA                       | 6X.5X12X50X6 |                               |
| 6                                   | 0.5                             | 60                                 | 8.00                                 | 16.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442052    | 1433HPA                       | 6X.5X16X60X6 |                               |
| 6                                   | 0.5                             | 60                                 | 8.00                                 | 20.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442053    | 1433HPA                       | 6X.5X20X60X6 |                               |
| 6                                   | 0.5                             | 70                                 | 8.00                                 | 30.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442054    | 1433HPA                       | 6X.5X30X70X6 |                               |
| 6                                   | 1.0                             | 50                                 | 8.00                                 | 12.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442055    | 1433HPA                       | 6X1X12X50X6  |                               |
| 6                                   | 1.0                             | 60                                 | 8.00                                 | 16.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442056    | 1433HPA                       | 6X1X16X60X6  |                               |
| 6                                   | 1.0                             | 60                                 | 8.00                                 | 20.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442057    | 1433HPA                       | 6X1X20X60X6  |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

|                                     |                                 |                                    |                                      |                                    |                                    |                                 |                                                                                                                                                            |        |        |        | 1433HPA |           |                               |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--------|---------|-----------|-------------------------------|-------------------------------|
| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |        |        |        |         | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30°                                                                                                                                                        | 1°     | 1°30'  | 2°     | 3°      |           |                               | €                             |
| 6                                   | 1.0                             | 70                                 | 8.00                                 | 30.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero  | 442058    | 1433HPA 6X1X30X70X6           |                               |
| 6                                   | 1.5                             | 60                                 | 8.00                                 | 20.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero  | 442059    | 1433HPA 6X1.5X20X60X6         |                               |
| 6                                   | 1.5                             | 70                                 | 8.00                                 | 30.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero  | 442060    | 1433HPA 6X1.5X30X70X6         |                               |
| 8                                   | 0.2                             | 65                                 | 12.00                                | 24.00                              | 8                                  | 7.60                            | libero                                                                                                                                                     | libero | libero | libero | libero  | 442061    | 1433HPA 8X.2X24X65X8          |                               |
| 8                                   | 0.3                             | 65                                 | 12.00                                | 24.00                              | 8                                  | 7.60                            | libero                                                                                                                                                     | libero | libero | libero | libero  | 442062    | 1433HPA 8X.3X24X65X8          |                               |
| 8                                   | 0.5                             | 65                                 | 12.00                                | 24.00                              | 8                                  | 7.60                            | libero                                                                                                                                                     | libero | libero | libero | libero  | 442063    | 1433HPA 8X.5X24X65X8          |                               |
| 8                                   | 1.0                             | 65                                 | 12.00                                | 24.00                              | 8                                  | 7.60                            | libero                                                                                                                                                     | libero | libero | libero | libero  | 442064    | 1433HPA 8X1X24X65X8           |                               |
| 8                                   | 1.5                             | 65                                 | 12.00                                | 24.00                              | 8                                  | 7.60                            | libero                                                                                                                                                     | libero | libero | libero | libero  | 442065    | 1433HPA 8X1.5X24X65X8         |                               |
| 10                                  | 0.5                             | 70                                 | 15.00                                | 25.00                              | 10                                 | 9.50                            | libero                                                                                                                                                     | libero | libero | libero | libero  | 442066    | 1433HPA 10X.5X25X70X10        |                               |
| 10                                  | 1.0                             | 70                                 | 15.00                                | 25.00                              | 10                                 | 9.50                            | libero                                                                                                                                                     | libero | libero | libero | libero  | 442067    | 1433HPA 10X1X25X70X10         |                               |
| 12                                  | 0.5                             | 80                                 | 15.00                                | 25.00                              | 12                                 | 11.50                           | libero                                                                                                                                                     | libero | libero | libero | libero  | 442068    | 1433HPA 12X.5X25X80X12        |                               |
| 12                                  | 1.0                             | 80                                 | 15.00                                | 25.00                              | 12                                 | 11.50                           | libero                                                                                                                                                     | libero | libero | libero | libero  | 442069    | 1433HPA 12X1X25X80X12         |                               |

Frese toriche con scarico in metallo duro integrale micrograna.  
Corner radius end mills long neck in solid carbide micro grain.

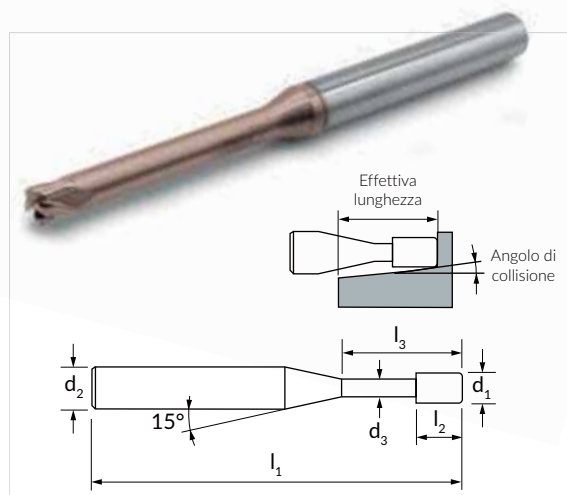
|  |  |   |  |   |
|--|--|---|--|---|
|  |  |   |  | - |
|  |  | - |  |   |

## Operazioni di fresatura | Milling strategies:

|  |  |   |   |  |   |
|--|--|---|---|--|---|
|  |  | - | - |  | - |
|--|--|---|---|--|---|

## Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |                                                          |
|---|---|---|---|---|---|----------------------------------------------------------|
|   |   |   |   |   |   | ● Raccomandato - Most suitable<br>○ Possibile - Possible |



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø          | Raggio   Radius |
|----------------------------------|-----------------|
| d ≤ 6: 0/-0.01   d > 6: 0/-0.015 | ±0.01           |

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |    |       |    |    |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-------|----|----|
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30°                                                                                                                                                        | 1° | 1°30' | 2° | 3° |

|   |      |    |      |       |   |      |       |       |       |       |       |
|---|------|----|------|-------|---|------|-------|-------|-------|-------|-------|
| 1 | 0.05 | 45 | 0.80 | 4.00  | 4 | 0.95 | 4.22  | 4.37  | 4.53  | 4.69  | 5.07  |
| 1 | 0.05 | 45 | 0.80 | 5.00  | 4 | 0.95 | 5.26  | 5.44  | 5.63  | 5.84  | 6.31  |
| 1 | 0.05 | 45 | 0.80 | 6.00  | 4 | 0.95 | 6.29  | 6.51  | 6.74  | 6.99  | 7.56  |
| 1 | 0.05 | 45 | 0.80 | 8.00  | 4 | 0.95 | 8.36  | 8.65  | 8.96  | 9.29  | 10.04 |
| 1 | 0.05 | 45 | 0.80 | 10.00 | 4 | 0.95 | 10.43 | 10.79 | 11.18 | 11.59 | 12.53 |
| 1 | 0.05 | 45 | 0.80 | 12.00 | 4 | 0.95 | 12.49 | 12.93 | 13.39 | 13.89 | 15.02 |
| 1 | 0.05 | 50 | 0.80 | 16.00 | 4 | 0.95 | 16.63 | 17.21 | 17.83 | 18.49 | 19.99 |
| 1 | 0.1  | 45 | 0.80 | 4.00  | 4 | 0.95 | 4.22  | 4.37  | 4.52  | 4.69  | 5.06  |
| 1 | 0.1  | 45 | 0.80 | 5.00  | 4 | 0.95 | 5.26  | 5.44  | 5.63  | 5.84  | 6.30  |
| 1 | 0.1  | 45 | 0.80 | 6.00  | 4 | 0.95 | 6.29  | 6.51  | 6.74  | 6.99  | 7.55  |
| 1 | 0.1  | 45 | 0.80 | 8.00  | 4 | 0.95 | 8.36  | 8.65  | 8.95  | 9.29  | 10.03 |
| 1 | 0.1  | 45 | 0.80 | 10.00 | 4 | 0.95 | 10.42 | 10.78 | 11.17 | 11.59 | 12.52 |
| 1 | 0.1  | 45 | 0.80 | 12.00 | 4 | 0.95 | 12.49 | 12.92 | 13.39 | 13.89 | 15.00 |
| 1 | 0.1  | 50 | 0.80 | 16.00 | 4 | 0.95 | 16.63 | 17.20 | 17.82 | 18.48 | 19.98 |
| 1 | 0.2  | 45 | 0.80 | 4.00  | 4 | 0.95 | 4.22  | 4.36  | 4.51  | 4.67  | 5.03  |
| 1 | 0.2  | 45 | 0.80 | 5.00  | 4 | 0.95 | 5.25  | 5.43  | 5.62  | 5.82  | 6.28  |
| 1 | 0.2  | 45 | 0.80 | 6.00  | 4 | 0.95 | 6.29  | 6.50  | 6.73  | 6.97  | 7.52  |
| 1 | 0.2  | 45 | 0.80 | 8.00  | 4 | 0.95 | 8.35  | 8.64  | 8.94  | 9.27  | 10.01 |

| 14334HPA  |                             |                               |
|-----------|-----------------------------|-------------------------------|
| ART. NUM. | Codice ordine<br>Order code | Prezzo utensile<br>Tool Price |
|           |                             | €                             |

|        |          |               |
|--------|----------|---------------|
| 442070 | 14334HPA | 1X.05X4X45X4  |
| 442071 | 14334HPA | 1X.05X5X45X4  |
| 442072 | 14334HPA | 1X.05X6X45X4  |
| 442073 | 14334HPA | 1X.05X8X45X4  |
| 442074 | 14334HPA | 1X.05X10X45X4 |
| 442075 | 14334HPA | 1X.05X12X45X4 |
| 442076 | 14334HPA | 1X.05X16X50X4 |
| 442077 | 14334HPA | 1X.1X4X45X4   |
| 442078 | 14334HPA | 1X.1X5X45X4   |
| 442079 | 14334HPA | 1X.1X6X45X4   |
| 442080 | 14334HPA | 1X.1X8X45X4   |
| 442081 | 14334HPA | 1X.1X10X45X4  |
| 442082 | 14334HPA | 1X.1X12X45X4  |
| 442083 | 14334HPA | 1X.1X16X50X4  |
| 442084 | 14334HPA | 1X.2X4X45X4   |
| 442085 | 14334HPA | 1X.2X5X45X4   |
| 442086 | 14334HPA | 1X.2X6X45X4   |
| 442087 | 14334HPA | 1X.2X8X45X4   |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

|                                     |                                 |                                    |                                      |                                    |                                    |                                 |                                                                                                                                                            |       |       |       |        | 14334HPA  |                               |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|--------|-----------|-------------------------------|-------------------------------|
| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |       |       |        | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30°                                                                                                                                                        | 1°    | 1°30' | 2°    | 3°     |           |                               | €                             |
| 1                                   | 0.2                             | 45                                 | 0.80                                 | 10.00                              | 4                                  | 0.95                            | 10.42                                                                                                                                                      | 10.78 | 11.16 | 11.57 | 12.49  | 442088    | 14334HPA 1X.2X10X45X4         |                               |
| 1                                   | 0.2                             | 45                                 | 0.80                                 | 12.00                              | 4                                  | 0.95                            | 12.49                                                                                                                                                      | 12.92 | 13.38 | 13.87 | 14.98  | 442089    | 14334HPA 1X.2X12X45X4         |                               |
| 1                                   | 0.2                             | 50                                 | 0.80                                 | 16.00                              | 4                                  | 0.95                            | 16.62                                                                                                                                                      | 17.20 | 17.81 | 18.47 | 19.95  | 442090    | 14334HPA 1X.2X16X50X4         |                               |
| 1                                   | 0.3                             | 45                                 | 0.80                                 | 4.00                               | 4                                  | 0.95                            | 4.22                                                                                                                                                       | 4.35  | 4.50  | 4.66  | 5.01   | 442091    | 14334HPA 1X.3X4X45X4          |                               |
| 1                                   | 0.3                             | 45                                 | 0.80                                 | 5.00                               | 4                                  | 0.95                            | 5.25                                                                                                                                                       | 5.42  | 5.61  | 5.81  | 6.25   | 442092    | 14334HPA 1X.3X5X45X4          |                               |
| 1                                   | 0.3                             | 45                                 | 0.80                                 | 6.00                               | 4                                  | 0.95                            | 6.28                                                                                                                                                       | 6.49  | 6.72  | 6.96  | 7.50   | 442093    | 14334HPA 1X.3X6X45X4          |                               |
| 1                                   | 0.3                             | 45                                 | 0.80                                 | 8.00                               | 4                                  | 0.95                            | 8.35                                                                                                                                                       | 8.63  | 8.93  | 9.26  | 9.98   | 442094    | 14334HPA 1X.3X8X45X4          |                               |
| 1                                   | 0.3                             | 45                                 | 0.80                                 | 10.00                              | 4                                  | 0.95                            | 10.42                                                                                                                                                      | 10.77 | 11.15 | 11.56 | 12.47  | 442095    | 14334HPA 1X.3X10X45X4         |                               |
| 1                                   | 0.3                             | 45                                 | 0.80                                 | 12.00                              | 4                                  | 0.95                            | 12.49                                                                                                                                                      | 12.91 | 13.37 | 13.86 | 14.96  | 442096    | 14334HPA 1X.3X12X45X4         |                               |
| 1                                   | 0.3                             | 50                                 | 0.80                                 | 16.00                              | 4                                  | 0.95                            | 16.62                                                                                                                                                      | 17.19 | 17.80 | 18.46 | 19.93  | 442097    | 14334HPA 1X.3X16X50X4         |                               |
| 1.2                                 | 0.1                             | 45                                 | 1.00                                 | 4.00                               | 4                                  | 1.14                            | 4.24                                                                                                                                                       | 4.39  | 4.54  | 4.71  | 5.08   | 442098    | 14334HPA 1.2X.1X4X45X4        |                               |
| 1.2                                 | 0.1                             | 45                                 | 1.00                                 | 6.00                               | 4                                  | 1.14                            | 6.31                                                                                                                                                       | 6.53  | 6.76  | 7.01  | 7.57   | 442099    | 14334HPA 1.2X.1X6X45X4        |                               |
| 1.2                                 | 0.1                             | 45                                 | 1.00                                 | 8.00                               | 4                                  | 1.14                            | 8.38                                                                                                                                                       | 8.67  | 8.97  | 9.31  | 10.06  | 442100    | 14334HPA 1.2X.1X8X45X4        |                               |
| 1.2                                 | 0.1                             | 45                                 | 1.00                                 | 12.00                              | 4                                  | 1.14                            | 12.51                                                                                                                                                      | 12.94 | 13.41 | 13.91 | 15.03  | 442101    | 14334HPA 1.2X.1X12X45X4       |                               |
| 1.2                                 | 0.2                             | 45                                 | 1.00                                 | 4.00                               | 4                                  | 1.14                            | 4.24                                                                                                                                                       | 4.38  | 4.53  | 4.69  | 5.06   | 442102    | 14334HPA 1.2X.2X4X45X4        |                               |
| 1.2                                 | 0.2                             | 45                                 | 1.00                                 | 6.00                               | 4                                  | 1.14                            | 6.31                                                                                                                                                       | 6.52  | 6.75  | 6.99  | 7.54   | 442103    | 14334HPA 1.2X.2X6X45X4        |                               |
| 1.2                                 | 0.2                             | 45                                 | 1.00                                 | 8.00                               | 4                                  | 1.14                            | 8.37                                                                                                                                                       | 8.66  | 8.96  | 9.29  | 10.03  | 442104    | 14334HPA 1.2X.2X8X45X4        |                               |
| 1.2                                 | 0.2                             | 45                                 | 1.00                                 | 12.00                              | 4                                  | 1.14                            | 12.51                                                                                                                                                      | 12.94 | 13.40 | 13.89 | 15.00  | 442105    | 14334HPA 1.2X.2X12X45X4       |                               |
| 1.2                                 | 0.3                             | 45                                 | 1.00                                 | 4.00                               | 4                                  | 1.14                            | 4.24                                                                                                                                                       | 4.37  | 4.52  | 4.68  | 5.03   | 442106    | 14334HPA 1.2X.3X4X45X4        |                               |
| 1.2                                 | 0.3                             | 45                                 | 1.00                                 | 6.00                               | 4                                  | 1.14                            | 6.30                                                                                                                                                       | 6.51  | 6.74  | 6.98  | 7.52   | 442107    | 14334HPA 1.2X.3X6X45X4        |                               |
| 1.2                                 | 0.3                             | 45                                 | 1.00                                 | 8.00                               | 4                                  | 1.14                            | 8.37                                                                                                                                                       | 8.65  | 8.95  | 9.28  | 10.01  | 442108    | 14334HPA 1.2X.3X8X45X4        |                               |
| 1.2                                 | 0.3                             | 45                                 | 1.00                                 | 12.00                              | 4                                  | 1.14                            | 12.50                                                                                                                                                      | 12.93 | 13.39 | 13.88 | 14.98  | 442109    | 14334HPA 1.2X.3X12X45X4       |                               |
| 1.5                                 | 0.1                             | 45                                 | 1.35                                 | 6.00                               | 4                                  | 1.44                            | 6.31                                                                                                                                                       | 6.53  | 6.76  | 7.01  | 7.57   | 442111    | 14334HPA 1.5X.1X6X45X4        |                               |
| 1.5                                 | 0.1                             | 45                                 | 1.35                                 | 8.00                               | 4                                  | 1.44                            | 8.38                                                                                                                                                       | 8.67  | 8.97  | 9.31  | 10.06  | 442112    | 14334HPA 1.5X.1X8X45X4        |                               |
| 1.5                                 | 0.1                             | 45                                 | 1.35                                 | 12.00                              | 4                                  | 1.44                            | 12.51                                                                                                                                                      | 12.94 | 13.41 | 13.91 | 15.03  | 442113    | 14334HPA 1.5X.1X12X45X4       |                               |
| 1.5                                 | 0.1                             | 50                                 | 1.35                                 | 16.00                              | 4                                  | 1.44                            | 16.65                                                                                                                                                      | 17.22 | 17.84 | 18.51 | 20.00  | 442114    | 14334HPA 1.5X.1X16X50X4       |                               |
| 1.5                                 | 0.1                             | 50                                 | 1.35                                 | 20.00                              | 4                                  | 1.44                            | 20.78                                                                                                                                                      | 21.50 | 22.27 | 23.11 | libero | 442115    | 14334HPA 1.5X.1X20X50X4       |                               |
| 1.5                                 | 0.2                             | 45                                 | 1.35                                 | 6.00                               | 4                                  | 1.44                            | 6.31                                                                                                                                                       | 6.52  | 6.75  | 6.99  | 7.54   | 442116    | 14334HPA 1.5X.2X6X45X4        |                               |
| 1.5                                 | 0.2                             | 45                                 | 1.35                                 | 8.00                               | 4                                  | 1.44                            | 8.37                                                                                                                                                       | 8.66  | 8.96  | 9.29  | 10.03  | 442117    | 14334HPA 1.5X.2X8X45X4        |                               |
| 1.5                                 | 0.2                             | 45                                 | 1.35                                 | 12.00                              | 4                                  | 1.44                            | 12.51                                                                                                                                                      | 12.94 | 13.40 | 13.89 | 15.00  | 442118    | 14334HPA 1.5X.2X12X45X4       |                               |
| 1.5                                 | 0.2                             | 50                                 | 1.35                                 | 16.00                              | 4                                  | 1.44                            | 16.64                                                                                                                                                      | 17.22 | 17.83 | 18.49 | 19.98  | 442119    | 14334HPA 1.5X.2X16X50X4       |                               |
| 1.5                                 | 0.2                             | 50                                 | 1.35                                 | 20.00                              | 4                                  | 1.44                            | 20.78                                                                                                                                                      | 21.49 | 22.26 | 23.09 | libero | 442120    | 14334HPA 1.5X.2X20X50X4       |                               |
| 1.5                                 | 0.3                             | 45                                 | 1.35                                 | 6.00                               | 4                                  | 1.44                            | 6.30                                                                                                                                                       | 6.51  | 6.74  | 6.98  | 7.52   | 442121    | 14334HPA 1.5X.3X6X45X4        |                               |
| 1.5                                 | 0.3                             | 45                                 | 1.35                                 | 8.00                               | 4                                  | 1.44                            | 8.37                                                                                                                                                       | 8.65  | 8.95  | 9.28  | 10.01  | 442122    | 14334HPA 1.5X.3X8X45X4        |                               |
| 1.5                                 | 0.3                             | 45                                 | 1.35                                 | 12.00                              | 4                                  | 1.44                            | 12.50                                                                                                                                                      | 12.93 | 13.39 | 13.88 | 14.98  | 442123    | 14334HPA 1.5X.3X12X45X4       |                               |
| 1.5                                 | 0.3                             | 50                                 | 1.35                                 | 16.00                              | 4                                  | 1.44                            | 16.64                                                                                                                                                      | 17.21 | 17.82 | 18.48 | 19.95  | 442124    | 14334HPA 1.5X.3X16X50X4       |                               |
| 1.5                                 | 0.3                             | 50                                 | 1.35                                 | 20.00                              | 4                                  | 1.44                            | 20.77                                                                                                                                                      | 21.49 | 22.25 | 23.08 | libero | 442125    | 14334HPA 1.5X.3X20X50X4       |                               |
| 1.5                                 | 0.5                             | 45                                 | 1.35                                 | 6.00                               | 4                                  | 1.44                            | 6.30                                                                                                                                                       | 6.50  | 6.71  | 6.95  | 7.47   | 442126    | 14334HPA 1.5X.5X6X45X4        |                               |
| 1.5                                 | 0.5                             | 45                                 | 1.35                                 | 8.00                               | 4                                  | 1.44                            | 8.36                                                                                                                                                       | 8.64  | 8.93  | 9.25  | 9.96   | 442127    | 14334HPA 1.5X.5X8X45X4        |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

Per Acciai Temprati ≤55 HRC  
For Hardened Steels ≤55 HRC

Frese toriche con scarico in metallo duro integrale micrograna.  
Corner radius end mills long neck in solid carbide micro grain.

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |    |       |    |    |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-------|----|----|
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30°                                                                                                                                                        | 1° | 1°30' | 2° | 3° |

| 14334HPA  |                               |                                                                                     |                               |
|-----------|-------------------------------|-------------------------------------------------------------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code |  | Prezzo utensile<br>Tool Price |
|           |                               |                                                                                     | €                             |

|     |     |    |      |       |   |      |       |       |       |        |        |
|-----|-----|----|------|-------|---|------|-------|-------|-------|--------|--------|
| 1.5 | 0.5 | 45 | 1.35 | 12.00 | 4 | 1.44 | 12.50 | 12.92 | 13.36 | 13.85  | 14.93  |
| 1.5 | 0.5 | 50 | 1.35 | 16.00 | 4 | 1.44 | 16.63 | 17.19 | 17.80 | 18.45  | 19.90  |
| 1.5 | 0.5 | 50 | 1.35 | 20.00 | 4 | 1.44 | 20.77 | 21.47 | 22.23 | 23.05  | libero |
| 2   | 0.1 | 45 | 1.70 | 6.00  | 4 | 1.92 | 6.35  | 6.57  | 6.80  | 7.05   | 7.62   |
| 2   | 0.1 | 45 | 1.70 | 8.00  | 4 | 1.92 | 8.42  | 8.71  | 9.02  | 9.35   | 10.10  |
| 2   | 0.1 | 45 | 1.70 | 10.00 | 4 | 1.92 | 10.48 | 10.84 | 11.23 | 11.65  | 12.59  |
| 2   | 0.1 | 45 | 1.70 | 12.00 | 4 | 1.92 | 12.55 | 12.98 | 13.45 | 13.95  | 15.07  |
| 2   | 0.1 | 50 | 1.70 | 16.00 | 4 | 1.92 | 16.68 | 17.26 | 17.88 | 18.55  | libero |
| 2   | 0.1 | 50 | 1.70 | 20.00 | 4 | 1.92 | 20.82 | 21.54 | 22.32 | 23.15  | libero |
| 2   | 0.1 | 60 | 1.70 | 25.00 | 4 | 1.92 | 25.99 | 26.89 | 27.86 | libero | libero |
| 2   | 0.2 | 45 | 1.70 | 6.00  | 4 | 1.92 | 6.34  | 6.56  | 6.79  | 7.04   | 7.59   |
| 2   | 0.2 | 45 | 1.70 | 8.00  | 4 | 1.92 | 8.41  | 8.70  | 9.01  | 9.34   | 10.08  |
| 2   | 0.2 | 45 | 1.70 | 10.00 | 4 | 1.92 | 10.48 | 10.84 | 11.22 | 11.64  | 12.56  |
| 2   | 0.2 | 45 | 1.70 | 12.00 | 4 | 1.92 | 12.55 | 12.98 | 13.44 | 13.93  | 15.05  |
| 2   | 0.2 | 50 | 1.70 | 16.00 | 4 | 1.92 | 16.68 | 17.26 | 17.87 | 18.53  | libero |
| 2   | 0.2 | 50 | 1.70 | 20.00 | 4 | 1.92 | 20.82 | 21.53 | 22.31 | 23.13  | libero |
| 2   | 0.2 | 60 | 1.70 | 25.00 | 4 | 1.92 | 25.98 | 26.88 | 27.85 | 28.88  | libero |
| 2   | 0.3 | 45 | 1.70 | 6.00  | 4 | 1.92 | 6.34  | 6.55  | 6.78  | 7.02   | 7.57   |
| 2   | 0.3 | 45 | 1.70 | 8.00  | 4 | 1.92 | 8.41  | 8.69  | 8.99  | 9.32   | 10.05  |
| 2   | 0.3 | 45 | 1.70 | 10.00 | 4 | 1.92 | 10.48 | 10.83 | 11.21 | 11.62  | 12.54  |
| 2   | 0.3 | 45 | 1.70 | 12.00 | 4 | 1.92 | 12.54 | 12.97 | 13.43 | 13.92  | 15.03  |
| 2   | 0.3 | 50 | 1.70 | 16.00 | 4 | 1.92 | 16.68 | 17.25 | 17.86 | 18.52  | libero |
| 2   | 0.3 | 50 | 1.70 | 20.00 | 4 | 1.92 | 20.81 | 21.53 | 22.29 | 23.12  | libero |
| 2   | 0.3 | 60 | 1.70 | 25.00 | 4 | 1.92 | 25.98 | 26.88 | 27.84 | 28.87  | libero |
| 2   | 0.5 | 45 | 1.70 | 6.00  | 4 | 1.92 | 6.33  | 6.54  | 6.76  | 6.99   | 7.52   |
| 2   | 0.5 | 45 | 1.70 | 8.00  | 4 | 1.92 | 8.40  | 8.68  | 8.97  | 9.29   | 10.00  |
| 2   | 0.5 | 45 | 1.70 | 10.00 | 4 | 1.92 | 10.47 | 10.82 | 11.19 | 11.59  | 12.49  |
| 2   | 0.5 | 45 | 1.70 | 12.00 | 4 | 1.92 | 12.54 | 12.96 | 13.41 | 13.89  | 14.98  |
| 2   | 0.5 | 50 | 1.70 | 16.00 | 4 | 1.92 | 16.67 | 17.23 | 17.84 | 18.49  | libero |
| 2   | 0.5 | 50 | 1.70 | 20.00 | 4 | 1.92 | 20.81 | 21.51 | 22.27 | 23.09  | libero |
| 2   | 0.5 | 60 | 1.70 | 25.00 | 4 | 1.92 | 25.97 | 26.86 | 27.81 | 28.84  | libero |
| 2.5 | 0.1 | 45 | 2.00 | 10.00 | 4 | 2.39 | 10.54 | 10.90 | 11.29 | 11.71  | 12.66  |
| 2.5 | 0.1 | 50 | 2.00 | 16.00 | 4 | 2.39 | 16.74 | 17.32 | 17.94 | 18.61  | libero |
| 2.5 | 0.1 | 60 | 2.00 | 25.00 | 4 | 2.39 | 26.05 | 26.95 | 27.92 | libero | libero |
| 2.5 | 0.2 | 45 | 2.00 | 10.00 | 4 | 2.39 | 10.54 | 10.90 | 11.28 | 11.70  | 12.63  |
| 2.5 | 0.2 | 50 | 2.00 | 16.00 | 4 | 2.39 | 16.74 | 17.32 | 17.93 | 18.60  | libero |
| 2.5 | 0.2 | 60 | 2.00 | 25.00 | 4 | 2.39 | 26.04 | 26.94 | 27.91 | libero | libero |
| 2.5 | 0.3 | 45 | 2.00 | 10.00 | 4 | 2.39 | 10.53 | 10.89 | 11.27 | 11.68  | 12.61  |
| 2.5 | 0.3 | 50 | 2.00 | 16.00 | 4 | 2.39 | 16.74 | 17.31 | 17.92 | 18.58  | libero |

|        |          |                |
|--------|----------|----------------|
| 442128 | 14334HPA | 1.5X.5X12X45X4 |
| 442129 | 14334HPA | 1.5X.5X16X50X4 |
| 442130 | 14334HPA | 1.5X.5X20X50X4 |
| 442131 | 14334HPA | 2X.1X6X45X4    |
| 442132 | 14334HPA | 2X.1X8X45X4    |
| 442133 | 14334HPA | 2X.1X10X45X4   |
| 442134 | 14334HPA | 2X.1X12X45X4   |
| 442135 | 14334HPA | 2X.1X16X50X4   |
| 442136 | 14334HPA | 2X.1X20X50X4   |
| 442137 | 14334HPA | 2X.1X25X60X4   |
| 442138 | 14334HPA | 2X.2X6X45X4    |
| 442139 | 14334HPA | 2X.2X8X45X4    |
| 442140 | 14334HPA | 2X.2X10X45X4   |
| 442141 | 14334HPA | 2X.2X12X45X4   |
| 442142 | 14334HPA | 2X.2X16X50X4   |
| 442143 | 14334HPA | 2X.2X20X50X4   |
| 442144 | 14334HPA | 2X.2X25X60X4   |
| 442145 | 14334HPA | 2X.3X6X45X4    |
| 442146 | 14334HPA | 2X.3X8X45X4    |
| 442147 | 14334HPA | 2X.3X10X45X4   |
| 442148 | 14334HPA | 2X.3X12X45X4   |
| 442149 | 14334HPA | 2X.3X16X50X4   |
| 442150 | 14334HPA | 2X.3X20X50X4   |
| 442151 | 14334HPA | 2X.3X25X60X4   |
| 442152 | 14334HPA | 2X.5X6X45X4    |
| 442153 | 14334HPA | 2X.5X8X45X4    |
| 442154 | 14334HPA | 2X.5X10X45X4   |
| 442155 | 14334HPA | 2X.5X12X45X4   |
| 442156 | 14334HPA | 2X.5X16X50X4   |
| 442157 | 14334HPA | 2X.5X20X50X4   |
| 442158 | 14334HPA | 2X.5X25X60X4   |
| 442159 | 14334HPA | 2.5X.1X10X45X4 |
| 442160 | 14334HPA | 2.5X.1X16X50X4 |
| 442161 | 14334HPA | 2.5X.1X25X60X4 |
| 442162 | 14334HPA | 2.5X.2X10X45X4 |
| 442163 | 14334HPA | 2.5X.2X16X50X4 |
| 442164 | 14334HPA | 2.5X.2X25X60X4 |
| 442165 | 14334HPA | 2.5X.3X10X45X4 |
| 442166 | 14334HPA | 2.5X.3X16X50X4 |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

|                                     |                                 |                                    |                                      |                                    |                                    |                                 |                                                                                                                                                            |       |       |        |        | 14334HPA  |                               |                                                                                     |  |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|--------|--------|-----------|-------------------------------|-------------------------------------------------------------------------------------|--|-------------------------------|
| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |       |        |        | ART. NUM. | Codice d'ordine<br>Order code |  |  | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30'                                                                                                                                                        | 1°    | 1°30' | 2°     | 3°     |           |                               | €                                                                                   |  |                               |
| 2.5                                 | 0.3                             | 60                                 | 2.00                                 | 25.00                              | 4                                  | 2.39                            | 26.04                                                                                                                                                      | 26.94 | 27.90 | libero | libero | 442167    | 14334HPA                      | 2.5X.3X25X60X4                                                                      |  |                               |
| 2.5                                 | 0.5                             | 45                                 | 2.00                                 | 10.00                              | 4                                  | 2.39                            | 10.53                                                                                                                                                      | 10.88 | 11.25 | 11.65  | 12.56  | 442168    | 14334HPA                      | 2.5X.5X10X45X4                                                                      |  |                               |
| 2.5                                 | 0.5                             | 50                                 | 2.00                                 | 16.00                              | 4                                  | 2.39                            | 16.73                                                                                                                                                      | 17.29 | 17.90 | 18.55  | libero | 442169    | 14334HPA                      | 2.5X.5X16X50X4                                                                      |  |                               |
| 2.5                                 | 0.5                             | 60                                 | 2.00                                 | 25.00                              | 4                                  | 2.39                            | 26.03                                                                                                                                                      | 26.92 | 27.88 | libero | libero | 442170    | 14334HPA                      | 2.5X.5X25X60X4                                                                      |  |                               |
| 3                                   | 0.1                             | 50                                 | 2.50                                 | 10.00                              | 6                                  | 2.86                            | 10.60                                                                                                                                                      | 10.96 | 11.36 | 11.78  | 12.73  | 442171    | 14334HPA                      | 3X.1X10X50X6                                                                        |  |                               |
| 3                                   | 0.1                             | 50                                 | 2.50                                 | 12.00                              | 6                                  | 2.86                            | 12.67                                                                                                                                                      | 13.10 | 13.57 | 14.08  | 15.21  | 442172    | 14334HPA                      | 3X.1X12X50X6                                                                        |  |                               |
| 3                                   | 0.1                             | 60                                 | 2.50                                 | 16.00                              | 6                                  | 2.86                            | 16.80                                                                                                                                                      | 17.38 | 18.01 | 18.68  | 20.19  | 442173    | 14334HPA                      | 3X.1X16X60X6                                                                        |  |                               |
| 3                                   | 0.1                             | 60                                 | 2.50                                 | 20.00                              | 6                                  | 2.86                            | 20.93                                                                                                                                                      | 21.66 | 22.44 | 23.28  | 25.16  | 442174    | 14334HPA                      | 3X.1X20X60X6                                                                        |  |                               |
| 3                                   | 0.1                             | 60                                 | 2.50                                 | 25.00                              | 6                                  | 2.86                            | 26.10                                                                                                                                                      | 27.01 | 27.98 | 29.03  | libero | 442175    | 14334HPA                      | 3X.1X25X60X6                                                                        |  |                               |
| 3                                   | 0.1                             | 70                                 | 2.50                                 | 30.00                              | 6                                  | 2.86                            | 31.27                                                                                                                                                      | 32.36 | 33.52 | 34.78  | libero | 442176    | 14334HPA                      | 3X.1X30X70X6                                                                        |  |                               |
| 3                                   | 0.1                             | 70                                 | 2.50                                 | 35.00                              | 6                                  | 2.86                            | 36.44                                                                                                                                                      | 37.71 | 39.06 | 40.53  | libero | 442177    | 14334HPA                      | 3X.1X35X70X6                                                                        |  |                               |
| 3                                   | 0.2                             | 50                                 | 2.50                                 | 10.00                              | 6                                  | 2.86                            | 10.59                                                                                                                                                      | 10.96 | 11.35 | 11.76  | 12.70  | 442178    | 14334HPA                      | 3X.2X10X50X6                                                                        |  |                               |
| 3                                   | 0.2                             | 50                                 | 2.50                                 | 12.00                              | 6                                  | 2.86                            | 12.66                                                                                                                                                      | 13.10 | 13.56 | 14.06  | 15.19  | 442179    | 14334HPA                      | 3X.2X12X50X6                                                                        |  |                               |
| 3                                   | 0.2                             | 60                                 | 2.50                                 | 16.00                              | 6                                  | 2.86                            | 16.80                                                                                                                                                      | 17.38 | 18.00 | 18.66  | 20.16  | 442180    | 14334HPA                      | 3X.2X16X60X6                                                                        |  |                               |
| 3                                   | 0.2                             | 60                                 | 2.50                                 | 20.00                              | 6                                  | 2.86                            | 20.93                                                                                                                                                      | 21.65 | 22.43 | 23.26  | 25.13  | 442181    | 14334HPA                      | 3X.2X20X60X6                                                                        |  |                               |
| 3                                   | 0.2                             | 60                                 | 2.50                                 | 25.00                              | 6                                  | 2.86                            | 26.10                                                                                                                                                      | 27.00 | 27.97 | 29.01  | libero | 442182    | 14334HPA                      | 3X.2X25X60X6                                                                        |  |                               |
| 3                                   | 0.2                             | 70                                 | 2.50                                 | 30.00                              | 6                                  | 2.86                            | 31.27                                                                                                                                                      | 32.35 | 33.51 | 34.76  | libero | 442183    | 14334HPA                      | 3X.2X30X70X6                                                                        |  |                               |
| 3                                   | 0.2                             | 70                                 | 2.50                                 | 35.00                              | 6                                  | 2.86                            | 36.44                                                                                                                                                      | 37.70 | 39.05 | 40.51  | libero | 442184    | 14334HPA                      | 3X.2X35X70X6                                                                        |  |                               |
| 3                                   | 0.3                             | 50                                 | 2.50                                 | 10.00                              | 6                                  | 2.86                            | 10.59                                                                                                                                                      | 10.95 | 11.34 | 11.75  | 12.68  | 442185    | 14334HPA                      | 3X.3X10X50X6                                                                        |  |                               |
| 3                                   | 0.3                             | 50                                 | 2.50                                 | 12.00                              | 6                                  | 2.86                            | 12.66                                                                                                                                                      | 13.09 | 13.55 | 14.05  | 15.16  | 442186    | 14334HPA                      | 3X.3X12X50X6                                                                        |  |                               |
| 3                                   | 0.3                             | 60                                 | 2.50                                 | 16.00                              | 6                                  | 2.86                            | 16.79                                                                                                                                                      | 17.37 | 17.99 | 18.65  | 20.14  | 442187    | 14334HPA                      | 3X.3X16X60X6                                                                        |  |                               |
| 3                                   | 0.3                             | 60                                 | 2.50                                 | 20.00                              | 6                                  | 2.86                            | 20.93                                                                                                                                                      | 21.65 | 22.42 | 23.25  | 25.11  | 442188    | 14334HPA                      | 3X.3X20X60X6                                                                        |  |                               |
| 3                                   | 0.3                             | 60                                 | 2.50                                 | 25.00                              | 6                                  | 2.86                            | 26.10                                                                                                                                                      | 27.00 | 27.96 | 29.00  | libero | 442189    | 14334HPA                      | 3X.3X25X60X6                                                                        |  |                               |
| 3                                   | 0.3                             | 70                                 | 2.50                                 | 30.00                              | 6                                  | 2.86                            | 31.26                                                                                                                                                      | 32.34 | 33.50 | 34.75  | libero | 442190    | 14334HPA                      | 3X.3X30X70X6                                                                        |  |                               |
| 3                                   | 0.3                             | 70                                 | 2.50                                 | 35.00                              | 6                                  | 2.86                            | 36.43                                                                                                                                                      | 37.69 | 39.04 | 40.50  | libero | 442191    | 14334HPA                      | 3X.3X35X70X6                                                                        |  |                               |
| 3                                   | 0.5                             | 50                                 | 2.50                                 | 10.00                              | 6                                  | 2.86                            | 10.58                                                                                                                                                      | 10.94 | 11.31 | 11.72  | 12.63  | 442192    | 14334HPA                      | 3X.5X10X50X6                                                                        |  |                               |
| 3                                   | 0.5                             | 50                                 | 2.50                                 | 12.00                              | 6                                  | 2.86                            | 12.65                                                                                                                                                      | 13.08 | 13.53 | 14.02  | 15.12  | 442193    | 14334HPA                      | 3X.5X12X50X6                                                                        |  |                               |
| 3                                   | 0.5                             | 60                                 | 2.50                                 | 16.00                              | 6                                  | 2.86                            | 16.79                                                                                                                                                      | 17.35 | 17.96 | 18.62  | 20.09  | 442194    | 14334HPA                      | 3X.5X16X60X6                                                                        |  |                               |
| 3                                   | 0.5                             | 60                                 | 2.50                                 | 20.00                              | 6                                  | 2.86                            | 20.92                                                                                                                                                      | 21.63 | 22.40 | 23.22  | 25.06  | 442195    | 14334HPA                      | 3X.5X20X60X6                                                                        |  |                               |
| 3                                   | 0.5                             | 60                                 | 2.50                                 | 25.00                              | 6                                  | 2.86                            | 26.09                                                                                                                                                      | 26.98 | 27.94 | 28.97  | libero | 442196    | 14334HPA                      | 3X.5X25X60X6                                                                        |  |                               |
| 3                                   | 0.5                             | 70                                 | 2.50                                 | 30.00                              | 6                                  | 2.86                            | 31.26                                                                                                                                                      | 32.33 | 33.48 | 34.72  | libero | 442197    | 14334HPA                      | 3X.5X30X70X6                                                                        |  |                               |
| 3                                   | 0.5                             | 70                                 | 2.50                                 | 35.00                              | 6                                  | 2.86                            | 36.43                                                                                                                                                      | 37.68 | 39.02 | 40.47  | libero | 442198    | 14334HPA                      | 3X.5X35X70X6                                                                        |  |                               |
| 3                                   | 1.0                             | 50                                 | 2.50                                 | 10.00                              | 6                                  | 2.86                            | 10.57                                                                                                                                                      | 10.90 | 11.26 | 11.64  | 12.51  | 442199    | 14334HPA                      | 3X.1X10X50X6                                                                        |  |                               |
| 3                                   | 1.0                             | 50                                 | 2.50                                 | 12.00                              | 6                                  | 2.86                            | 12.64                                                                                                                                                      | 13.04 | 13.48 | 13.94  | 14.99  | 442200    | 14334HPA                      | 3X.1X12X50X6                                                                        |  |                               |
| 3                                   | 1.0                             | 60                                 | 2.50                                 | 16.00                              | 6                                  | 2.86                            | 16.77                                                                                                                                                      | 17.32 | 17.91 | 18.54  | 19.97  | 442201    | 14334HPA                      | 3X.1X16X60X6                                                                        |  |                               |
| 3                                   | 1.0                             | 60                                 | 2.50                                 | 20.00                              | 6                                  | 2.86                            | 20.90                                                                                                                                                      | 21.60 | 22.34 | 23.14  | 24.94  | 442202    | 14334HPA                      | 3X.1X20X60X6                                                                        |  |                               |
| 3                                   | 1.0                             | 60                                 | 2.50                                 | 25.00                              | 6                                  | 2.86                            | 26.07                                                                                                                                                      | 26.95 | 27.88 | 28.89  | libero | 442203    | 14334HPA                      | 3X.1X25X60X6                                                                        |  |                               |
| 3                                   | 1.0                             | 70                                 | 2.50                                 | 30.00                              | 6                                  | 2.86                            | 31.24                                                                                                                                                      | 32.30 | 33.43 | 34.64  | libero | 442204    | 14334HPA                      | 3X.1X30X70X6                                                                        |  |                               |
| 3                                   | 1.0                             | 70                                 | 2.50                                 | 35.00                              | 6                                  | 2.86                            | 36.41                                                                                                                                                      | 37.64 | 38.97 | 40.39  | libero | 442205    | 14334HPA                      | 3X.1X35X70X6                                                                        |  |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

Per Acciai Temprati ≤55 HRC  
For Hardened Steels ≤55 HRC

Frese toriche con scarico in metallo duro integrale micrograna.  
Corner radius end mills long neck in solid carbide micro grain.

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |    |       |    |    |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-------|----|----|
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30°                                                                                                                                                        | 1° | 1°30' | 2° | 3° |

| 14334HPA  |                               |                                                                                     |                               |
|-----------|-------------------------------|-------------------------------------------------------------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code |  | Prezzo utensile<br>Tool Price |
|           |                               |                                                                                     | €                             |

|   |     |    |      |       |   |      |       |       |        |        |        |
|---|-----|----|------|-------|---|------|-------|-------|--------|--------|--------|
| 4 | 0.1 | 50 | 4.00 | 10.00 | 6 | 3.80 | 10.71 | 11.08 | 11.48  | 11.91  | 12.87  |
| 4 | 0.1 | 50 | 4.00 | 12.00 | 6 | 3.80 | 12.78 | 13.22 | 13.70  | 14.21  | 15.35  |
| 4 | 0.1 | 60 | 4.00 | 16.00 | 6 | 3.80 | 16.92 | 17.50 | 18.13  | 18.81  | libero |
| 4 | 0.1 | 60 | 4.00 | 20.00 | 6 | 3.80 | 21.05 | 21.78 | 22.56  | 23.41  | libero |
| 4 | 0.1 | 60 | 4.00 | 25.00 | 6 | 3.80 | 26.22 | 27.13 | 28.11  | libero | libero |
| 4 | 0.1 | 70 | 4.00 | 30.00 | 6 | 3.80 | 31.39 | 32.48 | 33.65  | libero | libero |
| 4 | 0.1 | 70 | 4.00 | 35.00 | 6 | 3.80 | 36.56 | 37.83 | libero | libero | libero |
| 4 | 0.1 | 80 | 4.00 | 40.00 | 6 | 3.80 | 41.72 | 43.17 | libero | libero | libero |
| 4 | 0.2 | 50 | 4.00 | 10.00 | 6 | 3.80 | 10.71 | 11.08 | 11.47  | 11.89  | 12.84  |
| 4 | 0.2 | 50 | 4.00 | 12.00 | 6 | 3.80 | 12.78 | 13.22 | 13.69  | 14.19  | 15.33  |
| 4 | 0.2 | 60 | 4.00 | 16.00 | 6 | 3.80 | 16.91 | 17.50 | 18.12  | 18.79  | libero |
| 4 | 0.2 | 60 | 4.00 | 20.00 | 6 | 3.80 | 21.05 | 21.77 | 22.55  | 23.39  | libero |
| 4 | 0.2 | 60 | 4.00 | 25.00 | 6 | 3.80 | 26.22 | 27.12 | 28.09  | libero | libero |
| 4 | 0.2 | 70 | 4.00 | 30.00 | 6 | 3.80 | 31.38 | 32.47 | 33.64  | libero | libero |
| 4 | 0.2 | 70 | 4.00 | 35.00 | 6 | 3.80 | 36.55 | 37.82 | libero | libero | libero |
| 4 | 0.2 | 80 | 4.00 | 40.00 | 6 | 3.80 | 41.72 | 43.17 | libero | libero | libero |
| 4 | 0.3 | 50 | 4.00 | 10.00 | 6 | 3.80 | 10.71 | 11.07 | 11.46  | 11.88  | 12.82  |
| 4 | 0.3 | 50 | 4.00 | 12.00 | 6 | 3.80 | 12.77 | 13.21 | 13.68  | 14.18  | 15.30  |
| 4 | 0.3 | 60 | 4.00 | 16.00 | 6 | 3.80 | 16.91 | 17.49 | 18.11  | 18.78  | libero |
| 4 | 0.3 | 60 | 4.00 | 20.00 | 6 | 3.80 | 21.04 | 21.77 | 22.54  | 23.38  | libero |
| 4 | 0.3 | 60 | 4.00 | 25.00 | 6 | 3.80 | 26.21 | 27.12 | 28.08  | libero | libero |
| 4 | 0.3 | 70 | 4.00 | 30.00 | 6 | 3.80 | 31.38 | 32.46 | 33.63  | libero | libero |
| 4 | 0.3 | 70 | 4.00 | 35.00 | 6 | 3.80 | 36.55 | 37.81 | libero | libero | libero |
| 4 | 0.3 | 80 | 4.00 | 40.00 | 6 | 3.80 | 41.72 | 43.16 | libero | libero | libero |
| 4 | 0.5 | 50 | 4.00 | 10.00 | 6 | 3.80 | 10.70 | 11.06 | 11.44  | 11.85  | 12.77  |
| 4 | 0.5 | 50 | 4.00 | 12.00 | 6 | 3.80 | 12.77 | 13.20 | 13.65  | 14.15  | 15.26  |
| 4 | 0.5 | 60 | 4.00 | 16.00 | 6 | 3.80 | 16.90 | 17.47 | 18.09  | 18.75  | libero |
| 4 | 0.5 | 60 | 4.00 | 20.00 | 6 | 3.80 | 21.04 | 21.75 | 22.52  | 23.35  | libero |
| 4 | 0.5 | 60 | 4.00 | 25.00 | 6 | 3.80 | 26.21 | 27.10 | 28.06  | 29.10  | libero |
| 4 | 0.5 | 70 | 4.00 | 30.00 | 6 | 3.80 | 31.37 | 32.45 | 33.60  | libero | libero |
| 4 | 0.5 | 70 | 4.00 | 35.00 | 6 | 3.80 | 36.54 | 37.80 | libero | libero | libero |
| 4 | 0.5 | 80 | 4.00 | 40.00 | 6 | 3.80 | 41.71 | 43.15 | libero | libero | libero |
| 4 | 1.0 | 50 | 4.00 | 10.00 | 6 | 3.80 | 10.68 | 11.02 | 11.38  | 11.77  | 12.65  |
| 4 | 1.0 | 50 | 4.00 | 12.00 | 6 | 3.80 | 12.75 | 13.16 | 13.60  | 14.07  | 15.13  |
| 4 | 1.0 | 60 | 4.00 | 16.00 | 6 | 3.80 | 16.89 | 17.44 | 18.03  | 18.67  | libero |
| 4 | 1.0 | 60 | 4.00 | 20.00 | 6 | 3.80 | 21.02 | 21.72 | 22.47  | 23.27  | libero |
| 4 | 1.0 | 60 | 4.00 | 25.00 | 6 | 3.80 | 26.19 | 27.07 | 28.01  | 29.02  | libero |
| 4 | 1.0 | 70 | 4.00 | 30.00 | 6 | 3.80 | 31.36 | 32.42 | 33.55  | libero | libero |
| 4 | 1.0 | 70 | 4.00 | 35.00 | 6 | 3.80 | 36.53 | 37.76 | 39.09  | libero | libero |

|        |          |              |
|--------|----------|--------------|
| 442206 | 14334HPA | 4X.1X10X50X6 |
| 442207 | 14334HPA | 4X.1X12X50X6 |
| 442208 | 14334HPA | 4X.1X16X60X6 |
| 442209 | 14334HPA | 4X.1X20X60X6 |
| 442210 | 14334HPA | 4X.1X25X60X6 |
| 442211 | 14334HPA | 4X.1X30X70X6 |
| 442212 | 14334HPA | 4X.1X35X70X6 |
| 442213 | 14334HPA | 4X.1X40X80X6 |
| 442214 | 14334HPA | 4X.2X10X50X6 |
| 442215 | 14334HPA | 4X.2X12X50X6 |
| 442216 | 14334HPA | 4X.2X16X60X6 |
| 442217 | 14334HPA | 4X.2X20X60X6 |
| 442218 | 14334HPA | 4X.2X25X60X6 |
| 442219 | 14334HPA | 4X.2X30X70X6 |
| 442220 | 14334HPA | 4X.2X35X70X6 |
| 442221 | 14334HPA | 4X.2X40X80X6 |
| 442222 | 14334HPA | 4X.3X10X50X6 |
| 442223 | 14334HPA | 4X.3X12X50X6 |
| 442224 | 14334HPA | 4X.3X16X60X6 |
| 442225 | 14334HPA | 4X.3X20X60X6 |
| 442226 | 14334HPA | 4X.3X25X60X6 |
| 442227 | 14334HPA | 4X.3X30X70X6 |
| 442228 | 14334HPA | 4X.3X35X70X6 |
| 442229 | 14334HPA | 4X.3X40X80X6 |
| 442230 | 14334HPA | 4X.5X10X50X6 |
| 442231 | 14334HPA | 4X.5X12X50X6 |
| 442232 | 14334HPA | 4X.5X16X60X6 |
| 442233 | 14334HPA | 4X.5X20X60X6 |
| 442234 | 14334HPA | 4X.5X25X60X6 |
| 442235 | 14334HPA | 4X.5X30X70X6 |
| 442236 | 14334HPA | 4X.5X35X70X6 |
| 442237 | 14334HPA | 4X.5X40X80X6 |
| 442238 | 14334HPA | 4X.1X10X50X6 |
| 442239 | 14334HPA | 4X.1X12X50X6 |
| 442240 | 14334HPA | 4X.1X16X60X6 |
| 442241 | 14334HPA | 4X.1X20X60X6 |
| 442242 | 14334HPA | 4X.1X25X60X6 |
| 442243 | 14334HPA | 4X.1X30X70X6 |
| 442244 | 14334HPA | 4X.1X35X70X6 |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

|                                     |                                 |                                    |                                      |                                    |                                    |                                 |                                                                                                                                                            |        |        |        |        | 14334HPA  |                               |                                                                                     |  |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--------|--------|-----------|-------------------------------|-------------------------------------------------------------------------------------|--|-------------------------------|
| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |        |        |        |        | ART. NUM. | Codice d'ordine<br>Order code |  |  | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30'                                                                                                                                                        | 1°     | 1°30'  | 2°     | 3°     |           |                               | €                                                                                   |  |                               |
| 4                                   | 1.0                             | 80                                 | 4.00                                 | 40.00                              | 6                                  | 3.80                            | 41.69                                                                                                                                                      | 43.11  | libero | libero | libero | 442245    | 14334HPA 4X1X40X80X6          |                                                                                     |  |                               |
| 5                                   | 0.1                             | 60                                 | 5.00                                 | 20.00                              | 6                                  | 4.75                            | 21.15                                                                                                                                                      | 21.88  | libero | libero | libero | 442246    | 14334HPA 5X.1X20X60X6         |                                                                                     |  |                               |
| 5                                   | 0.1                             | 80                                 | 5.00                                 | 40.00                              | 6                                  | 4.75                            | 41.82                                                                                                                                                      | libero | libero | libero | libero | 442247    | 14334HPA 5X.1X40X80X6         |                                                                                     |  |                               |
| 5                                   | 0.2                             | 50                                 | 5.00                                 | 12.00                              | 6                                  | 4.75                            | 12.87                                                                                                                                                      | 13.32  | 13.79  | 14.30  | libero | 442248    | 14334HPA 5X.2X12X50X6         |                                                                                     |  |                               |
| 5                                   | 0.2                             | 60                                 | 5.00                                 | 16.00                              | 6                                  | 4.75                            | 17.01                                                                                                                                                      | 17.59  | 18.22  | libero | libero | 442249    | 14334HPA 5X.2X16X60X6         |                                                                                     |  |                               |
| 5                                   | 0.2                             | 60                                 | 5.00                                 | 20.00                              | 6                                  | 4.75                            | 21.14                                                                                                                                                      | 21.87  | libero | libero | libero | 442250    | 14334HPA 5X.2X20X60X6         |                                                                                     |  |                               |
| 5                                   | 0.2                             | 80                                 | 5.00                                 | 40.00                              | 6                                  | 4.75                            | 41.82                                                                                                                                                      | libero | libero | libero | libero | 442251    | 14334HPA 5X.2X40X80X6         |                                                                                     |  |                               |
| 5                                   | 0.3                             | 60                                 | 5.00                                 | 20.00                              | 6                                  | 4.75                            | 21.14                                                                                                                                                      | 21.87  | libero | libero | libero | 442252    | 14334HPA 5X.3X20X60X6         |                                                                                     |  |                               |
| 5                                   | 0.3                             | 80                                 | 5.00                                 | 40.00                              | 6                                  | 4.75                            | 41.81                                                                                                                                                      | libero | libero | libero | libero | 442253    | 14334HPA 5X.3X40X80X6         |                                                                                     |  |                               |
| 5                                   | 0.5                             | 50                                 | 5.00                                 | 12.00                              | 6                                  | 4.75                            | 12.86                                                                                                                                                      | 13.30  | 13.76  | 14.25  | libero | 442254    | 14334HPA 5X.5X12X50X6         |                                                                                     |  |                               |
| 5                                   | 0.5                             | 60                                 | 5.00                                 | 16.00                              | 6                                  | 4.75                            | 17.00                                                                                                                                                      | 17.57  | 18.19  | libero | libero | 442255    | 14334HPA 5X.5X16X60X6         |                                                                                     |  |                               |
| 5                                   | 0.5                             | 60                                 | 5.00                                 | 20.00                              | 6                                  | 4.75                            | 21.13                                                                                                                                                      | 21.85  | libero | libero | libero | 442256    | 14334HPA 5X.5X20X60X6         |                                                                                     |  |                               |
| 5                                   | 0.5                             | 80                                 | 5.00                                 | 40.00                              | 6                                  | 4.75                            | 41.81                                                                                                                                                      | libero | libero | libero | libero | 442257    | 14334HPA 5X.5X40X80X6         |                                                                                     |  |                               |
| 5                                   | 1.0                             | 60                                 | 5.00                                 | 20.00                              | 6                                  | 4.75                            | 21.12                                                                                                                                                      | 21.82  | libero | libero | libero | 442258    | 14334HPA 5X1X20X60X6          |                                                                                     |  |                               |
| 5                                   | 1.0                             | 80                                 | 5.00                                 | 40.00                              | 6                                  | 4.75                            | 41.79                                                                                                                                                      | libero | libero | libero | libero | 442259    | 14334HPA 5X1X40X80X6          |                                                                                     |  |                               |
| 6                                   | 0.1                             | 60                                 | 6.00                                 | 20.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442260    | 14334HPA 6X.1X20X60X6         |                                                                                     |  |                               |
| 6                                   | 0.1                             | 80                                 | 6.00                                 | 40.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442261    | 14334HPA 6X.1X40X80X6         |                                                                                     |  |                               |
| 6                                   | 0.2                             | 60                                 | 6.00                                 | 16.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442262    | 14334HPA 6X.2X16X60X6         |                                                                                     |  |                               |
| 6                                   | 0.2                             | 60                                 | 6.00                                 | 20.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442263    | 14334HPA 6X.2X20X60X6         |                                                                                     |  |                               |
| 6                                   | 0.2                             | 80                                 | 6.00                                 | 40.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442264    | 14334HPA 6X.2X40X80X6         |                                                                                     |  |                               |
| 6                                   | 0.3                             | 60                                 | 6.00                                 | 16.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442265    | 14334HPA 6X.3X16X60X6         |                                                                                     |  |                               |
| 6                                   | 0.3                             | 60                                 | 6.00                                 | 20.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442266    | 14334HPA 6X.3X20X60X6         |                                                                                     |  |                               |
| 6                                   | 0.3                             | 80                                 | 6.00                                 | 40.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442267    | 14334HPA 6X.3X40X80X6         |                                                                                     |  |                               |
| 6                                   | 0.5                             | 60                                 | 6.00                                 | 16.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442268    | 14334HPA 6X.5X16X60X6         |                                                                                     |  |                               |
| 6                                   | 0.5                             | 60                                 | 6.00                                 | 20.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442269    | 14334HPA 6X.5X20X60X6         |                                                                                     |  |                               |
| 6                                   | 0.5                             | 80                                 | 6.00                                 | 40.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442270    | 14334HPA 6X.5X40X80X6         |                                                                                     |  |                               |
| 6                                   | 1.0                             | 60                                 | 6.00                                 | 16.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442271    | 14334HPA 6X1X16X60X6          |                                                                                     |  |                               |
| 6                                   | 1.0                             | 60                                 | 6.00                                 | 20.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442272    | 14334HPA 6X1X20X60X6          |                                                                                     |  |                               |
| 6                                   | 1.0                             | 80                                 | 6.00                                 | 40.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442273    | 14334HPA 6X1X40X80X6          |                                                                                     |  |                               |
| 8                                   | 0.3                             | 65                                 | 9.00                                 | 25.00                              | 8                                  | 7.60                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442274    | 14334HPA 8X.3X25X65X8         |                                                                                     |  |                               |
| 8                                   | 0.5                             | 65                                 | 9.00                                 | 25.00                              | 8                                  | 7.60                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442275    | 14334HPA 8X.5X25X65X8         |                                                                                     |  |                               |
| 8                                   | 1.0                             | 65                                 | 9.00                                 | 25.00                              | 8                                  | 7.60                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442276    | 14334HPA 8X1X25X65X8          |                                                                                     |  |                               |
| 8                                   | 1.5                             | 65                                 | 9.00                                 | 25.00                              | 8                                  | 7.60                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442277    | 14334HPA 8X1.5X25X65X8        |                                                                                     |  |                               |
| 10                                  | 0.5                             | 70                                 | 11.00                                | 25.00                              | 10                                 | 9.50                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442278    | 14334HPA 10X.5X25X70X10       |                                                                                     |  |                               |
| 10                                  | 1.0                             | 70                                 | 11.00                                | 25.00                              | 10                                 | 9.50                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442279    | 14334HPA 10X1X25X70X10        |                                                                                     |  |                               |
| 10                                  | 1.5                             | 70                                 | 11.00                                | 25.00                              | 10                                 | 9.50                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442280    | 14334HPA 10X1.5X25X70X10      |                                                                                     |  |                               |
| 10                                  | 2.0                             | 70                                 | 11.00                                | 25.00                              | 10                                 | 9.50                            | libero                                                                                                                                                     | libero | libero | libero | libero | 442281    | 14334HPA 10X2X25X70X10        |                                                                                     |  |                               |
| 12                                  | 0.5                             | 80                                 | 12.00                                | 30.00                              | 12                                 | 11.50                           | libero                                                                                                                                                     | libero | libero | libero | libero | 442282    | 14334HPA 12X.5X30X80X12       |                                                                                     |  |                               |
| 12                                  | 1.0                             | 80                                 | 12.00                                | 30.00                              | 12                                 | 11.50                           | libero                                                                                                                                                     | libero | libero | libero | libero | 442283    | 14334HPA 12X1X30X80X12        |                                                                                     |  |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

**Frese toriche con scarico in metallo duro integrale micrograna.**  
 Corner radius end mills long neck in solid carbide micro grain.

| 14334HPA                            |                                 |                                    |                                      |                                    |                                    |                                 |                                                                                                                                                            |        |        |        |        | 14334HPA  |                               |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--------|--------|-----------|-------------------------------|-------------------------------|
| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |        |        |        |        | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30°                                                                                                                                                        | 1°     | 1°30'  | 2°     | 3°     |           |                               | €                             |
| 12                                  | 1.5                             | 80                                 | 12.00                                | 30.00                              | 12                                 | 11.50                           | libero                                                                                                                                                     | libero | libero | libero | libero | 442284    | 14334HPA 12X1.5X30X80X12      |                               |
| 12                                  | 2.0                             | 80                                 | 12.00                                | 30.00                              | 12                                 | 11.50                           | libero                                                                                                                                                     | libero | libero | libero | libero | 442285    | 14334HPA 12X2X30X80X12        |                               |

**Frese sferiche in metallo duro integrale micrograna.**  
Ball nose end mills in solid carbide micro grain.

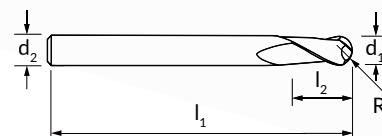
|  |  |   |  |   |
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## Operazioni di fresatura | Milling strategies:

|   |   |   |   |  |   |
|---|---|---|---|--|---|
| - | - | - | - |  | - |
|---|---|---|---|--|---|

## Gruppo materiali lavorabili | Group of working materials:

|   |   |   |   |   |   |                                                          |
|---|---|---|---|---|---|----------------------------------------------------------|
| P | M | K | N | S | H |                                                          |
|   |   |   |   |   |   | ● Raccomandato - Most suitable<br>○ Possibile - Possible |



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø           | Raggio   Radius                         |
|-----------------------------------|-----------------------------------------|
| d ≤ 6: 0/-0.01<br>d > 6: 0/-0.015 | R ≤ 0.25: 0/-0.005<br>R > 0.25: 0/-0.01 |

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |

|     |      |    |     |   |
|-----|------|----|-----|---|
| 0.2 | 0.1  | 45 | 0.4 | 4 |
| 0.3 | 0.15 | 45 | 0.6 | 4 |
| 0.4 | 0.2  | 45 | 0.8 | 4 |
| 0.5 | 0.25 | 45 | 1   | 4 |
| 0.6 | 0.3  | 45 | 1.2 | 4 |
| 0.7 | 0.35 | 45 | 1.5 | 4 |
| 0.8 | 0.4  | 45 | 2   | 4 |
| 1   | 0.5  | 45 | 2.5 | 4 |
| 1   | 0.5  | 50 | 2.5 | 6 |
| 1.2 | 0.6  | 45 | 3   | 4 |
| 1.5 | 0.75 | 45 | 3   | 4 |
| 1.5 | 0.75 | 50 | 3   | 6 |
| 2   | 1    | 45 | 5   | 4 |
| 2   | 1    | 50 | 5   | 6 |
| 2.5 | 1.25 | 45 | 6   | 4 |
| 2.5 | 1.25 | 50 | 6   | 6 |
| 3   | 1.5  | 50 | 8   | 4 |
| 3   | 1.5  | 60 | 8   | 6 |

| 416RHPA   |                               |                               |
|-----------|-------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
|           |                               | €                             |

|        |         |             |
|--------|---------|-------------|
| 445737 | 416RHPA | .2X.4X45X4  |
| 445738 | 416RHPA | .3X.6X45X4  |
| 445739 | 416RHPA | .4X.8X45X4  |
| 445740 | 416RHPA | .5X1X45X4   |
| 445741 | 416RHPA | .6X1.2X45X4 |
| 445742 | 416RHPA | .7X1.5X45X4 |
| 445743 | 416RHPA | .8X2X45X4   |
| 445744 | 416RHPA | 1X2.5X45X4  |
| 445745 | 416RHPA | 1X2.5X50X6  |
| 445746 | 416RHPA | 1.2X3X45X4  |
| 445747 | 416RHPA | 1.5X3X45X4  |
| 445748 | 416RHPA | 1.5X3X50X6  |
| 445749 | 416RHPA | 2X5X45X4    |
| 445750 | 416RHPA | 2X5X50X6    |
| 445751 | 416RHPA | 2.5X6X45X4  |
| 445752 | 416RHPA | 2.5X6X50X6  |
| 445753 | 416RHPA | 3X8X50X4    |
| 445754 | 416RHPA | 3X8X60X6    |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

Per Acciai Temprati ≤55 HRC  
For Hardened Steels ≤55 HRC

Frese sferiche in metallo duro integrale micrograna.  
Ball nose end mills in solid carbide micro grain.

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter | 416RHPA   |                               |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|-----------|-------------------------------|-------------------------------|
|                                     |                                 |                                    |                                      |                                    | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |           |                               | €                             |
| 3.5                                 | 1.75                            | 50                                 | 8                                    | 4                                  | 445755    | 416RHPA 3.5X8X50X4            |                               |
| 4                                   | 2                               | 60                                 | 8                                    | 4                                  | 445756    | 416RHPA 4X8X60X4              |                               |
| 4                                   | 2                               | 60                                 | 8                                    | 6                                  | 445757    | 416RHPA 4X8X60X6              |                               |
| 5                                   | 2.5                             | 70                                 | 10                                   | 6                                  | 445758    | 416RHPA 5X10X70X6             |                               |
| 6                                   | 3                               | 60                                 | 12                                   | 6                                  | 445759    | 416RHPA 6X12X60X6             |                               |
| 6                                   | 3                               | 70                                 | 12                                   | 6                                  | 445760    | 416RHPA 6X12X70X6             |                               |
| 6                                   | 3                               | 80                                 | 12                                   | 6                                  | 445761    | 416RHPA 6X12X80X6             |                               |
| 6                                   | 3                               | 90                                 | 12                                   | 6                                  | 445762    | 416RHPA 6X12X90X6             |                               |
| 6                                   | 3                               | 100                                | 12                                   | 6                                  | 445763    | 416RHPA 6X12X100X6            |                               |
| 7                                   | 3.5                             | 80                                 | 14                                   | 8                                  | 445764    | 416RHPA 7X14X80X8             |                               |
| 8                                   | 4                               | 60                                 | 14                                   | 8                                  | 445765    | 416RHPA 8X14X60X8             |                               |
| 8                                   | 4                               | 80                                 | 14                                   | 8                                  | 446118    | 416RHPA 8X14X80X8             |                               |
| 8                                   | 4                               | 90                                 | 14                                   | 8                                  | 445767    | 416RHPA 8X14X90X8             |                               |
| 8                                   | 4                               | 100                                | 14                                   | 8                                  | 445768    | 416RHPA 8X14X100X8            |                               |
| 8                                   | 4                               | 110                                | 14                                   | 8                                  | 445769    | 416RHPA 8X14X110X8            |                               |
| 9                                   | 4.5                             | 100                                | 16                                   | 10                                 | 445770    | 416RHPA 9X16X100X10           |                               |
| 10                                  | 5                               | 70                                 | 18                                   | 10                                 | 445771    | 416RHPA 10X18X70X10           |                               |
| 10                                  | 5                               | 90                                 | 18                                   | 10                                 | 445772    | 416RHPA 10X18X90X10           |                               |
| 10                                  | 5                               | 100                                | 18                                   | 10                                 | 445773    | 416RHPA 10X18X100X10          |                               |
| 12                                  | 6                               | 75                                 | 22                                   | 12                                 | 445774    | 416RHPA 12X22X75X12           |                               |
| 12                                  | 6                               | 100                                | 22                                   | 12                                 | 445775    | 416RHPA 12X22X100X12          |                               |
| 12                                  | 6                               | 110                                | 22                                   | 12                                 | 445776    | 416RHPA 12X22X110X12          |                               |
| 12                                  | 6                               | 130                                | 22                                   | 12                                 | 445777    | 416RHPA 12X22X130X12          |                               |
| 14                                  | 7                               | 105                                | 24                                   | 14                                 | 445778    | 416RHPA 14X24X105X14          |                               |
| 16                                  | 8                               | 105                                | 30                                   | 16                                 | 445779    | 416RHPA 16X30X105X16          |                               |
| 16                                  | 8                               | 160                                | 30                                   | 16                                 | 445780    | 416RHPA 16X30X160X16          |                               |
| 20                                  | 10                              | 160                                | 38                                   | 20                                 | 445781    | 416RHPA 20X38X160X20          |                               |

**Frese sferiche con scarico in metallo duro integrale micrograna.**  
Ball nose long neck end mills in solid carbide micro grain.

|  |  |   |  |   |
|--|--|---|--|---|
|  |  |   |  | - |
|  |  | - |  |   |

## Operazioni di fresatura | Milling strategies:

|   |   |   |   |  |   |
|---|---|---|---|--|---|
| - | - | - | - |  | - |
|---|---|---|---|--|---|

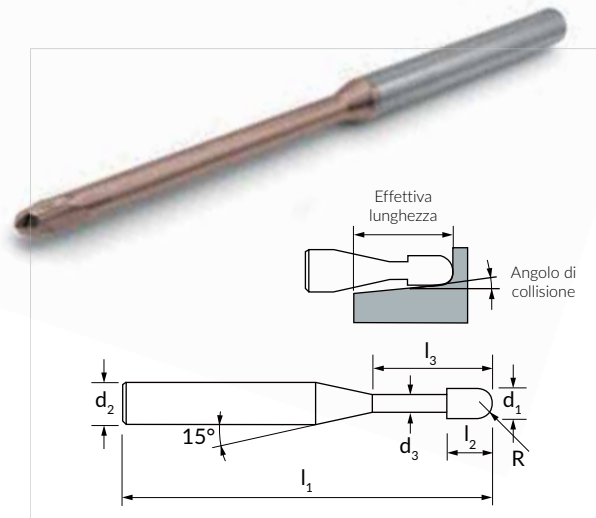
## Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |
|---|---|---|---|---|---|
|   |   |   |   |   |   |

● Raccomandato - Most suitable  
○ Possibile - Possible

## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø           | Raggio   Radius                         |
|-----------------------------------|-----------------------------------------|
| d ≤ 6: 0/-0.01<br>d > 6: 0/-0.015 | R ≤ 0.25: 0/-0.005<br>R > 0.25: 0/-0.01 |



| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |      |       |      |      |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|------|------|
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30°                                                                                                                                                        | 1°   | 1°30' | 2°   | 3°   |
| 0.2                                 | 0.1                             | 45                                 | 0.15                                 | 0.50                               | 4                                  | 0.18                            | 0.55                                                                                                                                                       | 0.56 | 0.58  | 0.6  | 0.64 |
| 0.2                                 | 0.1                             | 45                                 | 0.15                                 | 0.75                               | 4                                  | 0.18                            | 0.81                                                                                                                                                       | 0.83 | 0.86  | 0.89 | 0.95 |
| 0.2                                 | 0.1                             | 45                                 | 0.15                                 | 1.00                               | 4                                  | 0.18                            | 1.06                                                                                                                                                       | 1.1  | 1.13  | 1.17 | 1.26 |
| 0.2                                 | 0.1                             | 45                                 | 0.15                                 | 1.25                               | 4                                  | 0.18                            | 1.32                                                                                                                                                       | 1.37 | 1.41  | 1.46 | 1.57 |
| 0.2                                 | 0.1                             | 45                                 | 0.15                                 | 1.50                               | 4                                  | 0.18                            | 1.58                                                                                                                                                       | 1.63 | 1.69  | 1.75 | 1.88 |
| 0.2                                 | 0.1                             | 45                                 | 0.15                                 | 2.00                               | 4                                  | 0.18                            | 2.1                                                                                                                                                        | 2.17 | 2.24  | 2.32 | 2.5  |
| 0.2                                 | 0.1                             | 45                                 | 0.15                                 | 2.50                               | 4                                  | 0.18                            | 2.61                                                                                                                                                       | 2.7  | 2.8   | 2.9  | 3.12 |
| 0.2                                 | 0.1                             | 45                                 | 0.15                                 | 3.00                               | 4                                  | 0.18                            | 3.13                                                                                                                                                       | 3.24 | 3.35  | 3.47 | 3.75 |
| 0.3                                 | 0.15                            | 45                                 | 0.25                                 | 0.50                               | 4                                  | 0.28                            | 0.55                                                                                                                                                       | 0.56 | 0.57  | 0.59 | 0.63 |
| 0.3                                 | 0.15                            | 45                                 | 0.25                                 | 0.75                               | 4                                  | 0.28                            | 0.80                                                                                                                                                       | 0.83 | 0.85  | 0.88 | 0.94 |
| 0.3                                 | 0.15                            | 45                                 | 0.25                                 | 1.00                               | 4                                  | 0.28                            | 1.06                                                                                                                                                       | 1.09 | 1.13  | 1.17 | 1.25 |
| 0.3                                 | 0.15                            | 45                                 | 0.25                                 | 1.25                               | 4                                  | 0.28                            | 1.32                                                                                                                                                       | 1.36 | 1.41  | 1.45 | 1.56 |
| 0.3                                 | 0.15                            | 45                                 | 0.25                                 | 1.50                               | 4                                  | 0.28                            | 1.58                                                                                                                                                       | 1.63 | 1.68  | 1.74 | 1.87 |
| 0.3                                 | 0.15                            | 45                                 | 0.25                                 | 2.00                               | 4                                  | 0.28                            | 2.10                                                                                                                                                       | 2.16 | 2.24  | 2.32 | 2.49 |
| 0.3                                 | 0.15                            | 45                                 | 0.25                                 | 2.50                               | 4                                  | 0.28                            | 2.61                                                                                                                                                       | 2.70 | 2.79  | 2.89 | 3.11 |
| 0.3                                 | 0.15                            | 45                                 | 0.25                                 | 3.00                               | 4                                  | 0.28                            | 3.13                                                                                                                                                       | 3.23 | 3.35  | 3.47 | 3.73 |
| 0.4                                 | 0.2                             | 45                                 | 0.30                                 | 1.00                               | 4                                  | 0.37                            | 1.08                                                                                                                                                       | 1.11 | 1.14  | 1.18 | 1.26 |
| 0.4                                 | 0.2                             | 45                                 | 0.30                                 | 1.50                               | 4                                  | 0.37                            | 1.60                                                                                                                                                       | 1.65 | 1.70  | 1.75 | 1.88 |

| 431RHPA   |                             |                               |
|-----------|-----------------------------|-------------------------------|
| ART. NUM. | Codice ordine<br>Order code | Prezzo utensile<br>Tool Price |
|           |                             | €                             |
| 441549    | 431RHPA .2X.1X.5X45X4       |                               |
| 441550    | 431RHPA .2X.1X.75X45X4      |                               |
| 441551    | 431RHPA .2X.1X1X45X4        |                               |
| 441552    | 431RHPA .2X.1X1.25X45X4     |                               |
| 441553    | 431RHPA .2X.1X1.5X45X4      |                               |
| 441554    | 431RHPA .2X.1X2X45X4        |                               |
| 441555    | 431RHPA .2X.1X2.5X45X4      |                               |
| 441556    | 431RHPA .2X.1X3X45X4        |                               |
| 441557    | 431RHPA .3X.15X.5X45X4      |                               |
| 441558    | 431RHPA .3X.15X.75X45X4     |                               |
| 441559    | 431RHPA .3X.15X1X45X4       |                               |
| 441560    | 431RHPA .3X.15X1.25X45X4    |                               |
| 441561    | 431RHPA .3X.15X1.5X45X4     |                               |
| 441562    | 431RHPA .3X.15X2X45X4       |                               |
| 441563    | 431RHPA .3X.15X2.5X45X4     |                               |
| 441564    | 431RHPA .3X.15X3X45X4       |                               |
| 441565    | 431RHPA .4X.2X1X45X4        |                               |
| 441566    | 431RHPA .4X.2X1.5X45X4      |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

Frese sferiche con scarico in metallo duro integrale micrograna.  
Ball nose long neck end mills in solid carbide micro grain.

| 431RHPA                             |                                 |                                    |                                      |                                    |                                    |                                 |                                                                                                                                                            |       |       |       |       | 431RHPA   |                               |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-----------|-------------------------------|-------------------------------|
| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |       |       |       | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30°                                                                                                                                                        | 1°    | 1°30' | 2°    | 3°    |           |                               | €                             |
| 0.4                                 | 0.2                             | 45                                 | 0.30                                 | 2.00                               | 4                                  | 0.37                            | 2.11                                                                                                                                                       | 2.18  | 2.25  | 2.33  | 2.50  | 441567    | 431RHPA .4X.2X2X45X4          |                               |
| 0.4                                 | 0.2                             | 45                                 | 0.30                                 | 2.50                               | 4                                  | 0.37                            | 2.63                                                                                                                                                       | 2.72  | 2.81  | 2.90  | 3.12  | 441568    | 431RHPA .4X.2X2.5X45X4        |                               |
| 0.4                                 | 0.2                             | 45                                 | 0.30                                 | 3.00                               | 4                                  | 0.37                            | 3.15                                                                                                                                                       | 3.25  | 3.36  | 3.48  | 3.75  | 441569    | 431RHPA .4X.2X3X45X4          |                               |
| 0.4                                 | 0.2                             | 45                                 | 0.30                                 | 3.50                               | 4                                  | 0.37                            | 3.66                                                                                                                                                       | 3.78  | 3.91  | 4.05  | 4.37  | 441570    | 431RHPA .4X.2X3.5X45X4        |                               |
| 0.4                                 | 0.2                             | 45                                 | 0.30                                 | 4.00                               | 4                                  | 0.37                            | 4.18                                                                                                                                                       | 4.32  | 4.47  | 4.63  | 4.99  | 441571    | 431RHPA .4X.2X4X45X4          |                               |
| 0.4                                 | 0.2                             | 45                                 | 0.30                                 | 4.50                               | 4                                  | 0.37                            | 4.70                                                                                                                                                       | 4.85  | 5.02  | 5.20  | 5.61  | 441572    | 431RHPA .4X.2X4.5X45X4        |                               |
| 0.4                                 | 0.2                             | 45                                 | 0.30                                 | 5.00                               | 4                                  | 0.37                            | 5.21                                                                                                                                                       | 5.39  | 5.58  | 5.78  | 6.23  | 441573    | 431RHPA .4X.2X5X45X4          |                               |
| 0.4                                 | 0.2                             | 45                                 | 0.30                                 | 6.00                               | 4                                  | 0.37                            | 6.25                                                                                                                                                       | 6.46  | 6.69  | 6.93  | 7.47  | 441574    | 431RHPA .4X.2X6X45X4          |                               |
| 0.4                                 | 0.2                             | 45                                 | 0.30                                 | 8.00                               | 4                                  | 0.37                            | 8.32                                                                                                                                                       | 8.60  | 8.90  | 9.23  | 9.96  | 441575    | 431RHPA .4X.2X8X45X4          |                               |
| 0.5                                 | 0.25                            | 45                                 | 0.35                                 | 1.00                               | 4                                  | 0.47                            | 1.08                                                                                                                                                       | 1.11  | 1.14  | 1.17  | 1.25  | 441576    | 431RHPA .5X.25X1X45X4         |                               |
| 0.5                                 | 0.25                            | 45                                 | 0.35                                 | 1.50                               | 4                                  | 0.47                            | 1.59                                                                                                                                                       | 1.64  | 1.69  | 1.75  | 1.87  | 441577    | 431RHPA .5X.25X1.5X45X4       |                               |
| 0.5                                 | 0.25                            | 45                                 | 0.35                                 | 2.00                               | 4                                  | 0.47                            | 2.11                                                                                                                                                       | 2.18  | 2.25  | 2.32  | 2.49  | 441578    | 431RHPA .5X.25X2X45X4         |                               |
| 0.5                                 | 0.25                            | 45                                 | 0.35                                 | 2.50                               | 4                                  | 0.47                            | 2.63                                                                                                                                                       | 2.71  | 2.80  | 2.90  | 3.11  | 441579    | 431RHPA .5X.25X2.5X45X4       |                               |
| 0.5                                 | 0.25                            | 45                                 | 0.35                                 | 3.00                               | 4                                  | 0.47                            | 3.15                                                                                                                                                       | 3.25  | 3.35  | 3.47  | 3.73  | 441580    | 431RHPA .5X.25X3X45X4         |                               |
| 0.5                                 | 0.25                            | 45                                 | 0.35                                 | 4.00                               | 4                                  | 0.47                            | 4.18                                                                                                                                                       | 4.32  | 4.46  | 4.62  | 4.98  | 441581    | 431RHPA .5X.25X4X45X4         |                               |
| 0.5                                 | 0.25                            | 45                                 | 0.35                                 | 5.00                               | 4                                  | 0.47                            | 5.21                                                                                                                                                       | 5.39  | 5.57  | 5.77  | 6.22  | 441582    | 431RHPA .5X.25X5X45X4         |                               |
| 0.5                                 | 0.25                            | 45                                 | 0.35                                 | 6.00                               | 4                                  | 0.47                            | 6.25                                                                                                                                                       | 6.46  | 6.68  | 6.92  | 7.46  | 441583    | 431RHPA .5X.25X6X45X4         |                               |
| 0.5                                 | 0.25                            | 45                                 | 0.35                                 | 8.00                               | 4                                  | 0.47                            | 8.31                                                                                                                                                       | 8.59  | 8.90  | 9.22  | 9.95  | 441584    | 431RHPA .5X.25X8X45X4         |                               |
| 0.5                                 | 0.25                            | 45                                 | 0.35                                 | 10.00                              | 4                                  | 0.47                            | 10.38                                                                                                                                                      | 10.73 | 11.11 | 11.52 | 12.44 | 441585    | 431RHPA .5X.25X10X45X4        |                               |
| 0.6                                 | 0.3                             | 45                                 | 0.40                                 | 1.00                               | 4                                  | 0.57                            | 1.08                                                                                                                                                       | 1.10  | 1.13  | 1.16  | 1.23  | 441586    | 431RHPA .6X.3X1X45X4          |                               |
| 0.6                                 | 0.3                             | 45                                 | 0.40                                 | 2.00                               | 4                                  | 0.57                            | 2.11                                                                                                                                                       | 2.17  | 2.24  | 2.31  | 2.48  | 441587    | 431RHPA .6X.3X2X45X4          |                               |
| 0.6                                 | 0.3                             | 45                                 | 0.40                                 | 2.50                               | 4                                  | 0.57                            | 2.63                                                                                                                                                       | 2.71  | 2.80  | 2.89  | 3.10  | 441588    | 431RHPA .6X.3X2.5X45X4        |                               |
| 0.6                                 | 0.3                             | 45                                 | 0.40                                 | 3.00                               | 4                                  | 0.57                            | 3.14                                                                                                                                                       | 3.24  | 3.35  | 3.46  | 3.72  | 441589    | 431RHPA .6X.3X3X45X4          |                               |
| 0.6                                 | 0.3                             | 45                                 | 0.40                                 | 3.50                               | 4                                  | 0.57                            | 3.66                                                                                                                                                       | 3.78  | 3.90  | 4.04  | 4.34  | 441590    | 431RHPA .6X.3X3.5X45X4        |                               |
| 0.6                                 | 0.3                             | 45                                 | 0.40                                 | 4.00                               | 4                                  | 0.57                            | 4.18                                                                                                                                                       | 4.31  | 4.46  | 4.61  | 4.96  | 441591    | 431RHPA .6X.3X4X45X4          |                               |
| 0.6                                 | 0.3                             | 45                                 | 0.40                                 | 4.50                               | 4                                  | 0.57                            | 4.69                                                                                                                                                       | 4.85  | 5.01  | 5.19  | 5.59  | 441593    | 431RHPA .6X.3X4.5X45X4        |                               |
| 0.6                                 | 0.3                             | 45                                 | 0.40                                 | 5.00                               | 4                                  | 0.57                            | 5.21                                                                                                                                                       | 5.38  | 5.57  | 5.76  | 6.21  | 441594    | 431RHPA .6X.3X5X45X4          |                               |
| 0.6                                 | 0.3                             | 45                                 | 0.40                                 | 5.50                               | 4                                  | 0.57                            | 5.73                                                                                                                                                       | 5.92  | 6.12  | 6.34  | 6.83  | 441595    | 431RHPA .6X.3X5.5X45X4        |                               |
| 0.6                                 | 0.3                             | 45                                 | 0.40                                 | 6.00                               | 4                                  | 0.57                            | 6.24                                                                                                                                                       | 6.45  | 6.67  | 6.91  | 7.45  | 441596    | 431RHPA .6X.3X6X45X4          |                               |
| 0.6                                 | 0.3                             | 45                                 | 0.40                                 | 8.00                               | 4                                  | 0.57                            | 8.31                                                                                                                                                       | 8.59  | 8.89  | 9.21  | 9.94  | 441597    | 431RHPA .6X.3X8X45X4          |                               |
| 0.6                                 | 0.3                             | 45                                 | 0.40                                 | 10.00                              | 4                                  | 0.57                            | 10.38                                                                                                                                                      | 10.73 | 11.11 | 11.51 | 12.42 | 441598    | 431RHPA .6X.3X10X45X4         |                               |
| 0.6                                 | 0.3                             | 45                                 | 0.40                                 | 12.00                              | 4                                  | 0.57                            | 12.45                                                                                                                                                      | 12.87 | 13.32 | 13.81 | 14.91 | 441599    | 431RHPA .6X.3X12X45X4         |                               |
| 0.7                                 | 0.35                            | 45                                 | 0.45                                 | 2.00                               | 4                                  | 0.66                            | 2.13                                                                                                                                                       | 2.19  | 2.26  | 2.33  | 2.49  | 441600    | 431RHPA .7X.35X2X45X4         |                               |
| 0.7                                 | 0.35                            | 45                                 | 0.45                                 | 4.00                               | 4                                  | 0.66                            | 4.20                                                                                                                                                       | 4.33  | 4.47  | 4.63  | 4.98  | 441601    | 431RHPA .7X.35X4X45X4         |                               |
| 0.7                                 | 0.35                            | 45                                 | 0.45                                 | 6.00                               | 4                                  | 0.66                            | 6.26                                                                                                                                                       | 6.47  | 6.69  | 6.93  | 7.46  | 441602    | 431RHPA .7X.35X6X45X4         |                               |
| 0.7                                 | 0.35                            | 45                                 | 0.45                                 | 8.00                               | 4                                  | 0.66                            | 8.33                                                                                                                                                       | 8.61  | 8.91  | 9.23  | 9.95  | 441603    | 431RHPA .7X.35X8X45X4         |                               |
| 0.8                                 | 0.4                             | 45                                 | 0.50                                 | 2.00                               | 4                                  | 0.77                            | 2.11                                                                                                                                                       | 2.17  | 2.23  | 2.30  | 2.45  | 441604    | 431RHPA .8X.4X2X45X4          |                               |
| 0.8                                 | 0.4                             | 45                                 | 0.50                                 | 3.00                               | 4                                  | 0.77                            | 3.14                                                                                                                                                       | 3.24  | 3.34  | 3.45  | 3.70  | 441605    | 431RHPA .8X.4X3X45X4          |                               |
| 0.8                                 | 0.4                             | 45                                 | 0.50                                 | 4.00                               | 4                                  | 0.77                            | 4.17                                                                                                                                                       | 4.31  | 4.45  | 4.60  | 4.94  | 441606    | 431RHPA .8X.4X4X45X4          |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

|                                     |                                 |                                    |                                      |                                    |                                    |                                 |                                                                                                                                                            |       |       |       |       | 431RHPA   |                               |                                                                                     |  |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-----------|-------------------------------|-------------------------------------------------------------------------------------|--|-------------------------------|
| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |       |       |       | ART. NUM. | Codice d'ordine<br>Order code |  |  | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30'                                                                                                                                                        | 1°    | 1°30' | 2°    | 3°    |           |                               | €                                                                                   |  |                               |
| 0.8                                 | 0.4                             | 45                                 | 0.50                                 | 5.00                               | 4                                  | 0.77                            | 5.21                                                                                                                                                       | 5.38  | 5.56  | 5.75  | 6.18  | 441607    | 431RHPA .8X.4X5X45X4          |                                                                                     |  |                               |
| 0.8                                 | 0.4                             | 45                                 | 0.50                                 | 6.00                               | 4                                  | 0.77                            | 6.24                                                                                                                                                       | 6.45  | 6.66  | 6.90  | 7.43  | 441608    | 431RHPA .8X.4X6X45X4          |                                                                                     |  |                               |
| 0.8                                 | 0.4                             | 45                                 | 0.50                                 | 8.00                               | 4                                  | 0.77                            | 8.31                                                                                                                                                       | 8.58  | 8.88  | 9.20  | 9.91  | 441609    | 431RHPA .8X.4X8X45X4          |                                                                                     |  |                               |
| 0.8                                 | 0.4                             | 45                                 | 0.50                                 | 10.00                              | 4                                  | 0.77                            | 10.38                                                                                                                                                      | 10.72 | 11.10 | 11.50 | 12.40 | 441610    | 431RHPA .8X.4X10X45X4         |                                                                                     |  |                               |
| 0.8                                 | 0.4                             | 45                                 | 0.50                                 | 12.00                              | 4                                  | 0.77                            | 12.44                                                                                                                                                      | 12.86 | 13.31 | 13.80 | 14.89 | 441611    | 431RHPA .8X.4X12X45X4         |                                                                                     |  |                               |
| 0.9                                 | 0.45                            | 45                                 | 0.60                                 | 2.00                               | 4                                  | 0.85                            | 2.14                                                                                                                                                       | 2.20  | 2.27  | 2.33  | 2.49  | 441612    | 431RHPA .9X.45X2X45X4         |                                                                                     |  |                               |
| 0.9                                 | 0.45                            | 45                                 | 0.60                                 | 4.00                               | 4                                  | 0.85                            | 4.21                                                                                                                                                       | 4.34  | 4.48  | 4.63  | 4.97  | 441613    | 431RHPA .9X.45X4X45X4         |                                                                                     |  |                               |
| 0.9                                 | 0.45                            | 45                                 | 0.60                                 | 6.00                               | 4                                  | 0.85                            | 6.28                                                                                                                                                       | 6.48  | 6.70  | 6.93  | 7.46  | 441614    | 431RHPA .9X.45X6X45X4         |                                                                                     |  |                               |
| 0.9                                 | 0.45                            | 45                                 | 0.60                                 | 8.00                               | 4                                  | 0.85                            | 8.35                                                                                                                                                       | 8.62  | 8.92  | 9.23  | 9.95  | 441615    | 431RHPA .9X.45X8X45X4         |                                                                                     |  |                               |
| 0.9                                 | 0.45                            | 45                                 | 0.60                                 | 10.00                              | 4                                  | 0.85                            | 10.41                                                                                                                                                      | 10.76 | 11.13 | 11.53 | 12.43 | 441616    | 431RHPA .9X.45X10X45X4        |                                                                                     |  |                               |
| 1                                   | 0.5                             | 45                                 | 0.80                                 | 2.00                               | 4                                  | 0.95                            | 2.14                                                                                                                                                       | 2.20  | 2.26  | 2.33  | 2.48  | 441617    | 431RHPA 1X.5X2X45X4           |                                                                                     |  |                               |
| 1                                   | 0.5                             | 45                                 | 0.80                                 | 3.00                               | 4                                  | 0.95                            | 3.18                                                                                                                                                       | 3.27  | 3.37  | 3.48  | 3.72  | 441618    | 431RHPA 1X.5X3X45X4           |                                                                                     |  |                               |
| 1                                   | 0.5                             | 45                                 | 0.80                                 | 4.00                               | 4                                  | 0.95                            | 4.21                                                                                                                                                       | 4.34  | 4.48  | 4.63  | 4.96  | 441619    | 431RHPA 1X.5X4X45X4           |                                                                                     |  |                               |
| 1                                   | 0.5                             | 50                                 | 0.80                                 | 4.00                               | 6                                  | 0.95                            | 4.21                                                                                                                                                       | 4.34  | 4.48  | 4.63  | 4.96  | 441620    | 431RHPA 1X.5X4X50X6           |                                                                                     |  |                               |
| 1                                   | 0.5                             | 45                                 | 0.80                                 | 5.00                               | 4                                  | 0.95                            | 5.24                                                                                                                                                       | 5.41  | 5.59  | 5.78  | 6.21  | 441621    | 431RHPA 1X.5X5X45X4           |                                                                                     |  |                               |
| 1                                   | 0.5                             | 45                                 | 0.80                                 | 6.00                               | 4                                  | 0.95                            | 6.28                                                                                                                                                       | 6.48  | 6.69  | 6.93  | 7.45  | 441622    | 431RHPA 1X.5X6X45X4           |                                                                                     |  |                               |
| 1                                   | 0.5                             | 50                                 | 0.80                                 | 6.00                               | 6                                  | 0.95                            | 6.28                                                                                                                                                       | 6.48  | 6.69  | 6.93  | 7.45  | 441623    | 431RHPA 1X.5X6X50X6           |                                                                                     |  |                               |
| 1                                   | 0.5                             | 45                                 | 0.80                                 | 8.00                               | 4                                  | 0.95                            | 8.34                                                                                                                                                       | 8.62  | 8.91  | 9.23  | 9.93  | 441624    | 431RHPA 1X.5X8X45X4           |                                                                                     |  |                               |
| 1                                   | 0.5                             | 50                                 | 0.80                                 | 8.00                               | 6                                  | 0.95                            | 8.34                                                                                                                                                       | 8.62  | 8.91  | 9.23  | 9.93  | 441625    | 431RHPA 1X.5X8X50X6           |                                                                                     |  |                               |
| 1                                   | 0.5                             | 45                                 | 0.80                                 | 10.00                              | 4                                  | 0.95                            | 10.41                                                                                                                                                      | 10.76 | 11.13 | 11.53 | 12.42 | 441626    | 431RHPA 1X.5X10X45X4          |                                                                                     |  |                               |
| 1                                   | 0.5                             | 50                                 | 0.80                                 | 10.00                              | 6                                  | 0.95                            | 10.41                                                                                                                                                      | 10.76 | 11.13 | 11.53 | 12.42 | 441627    | 431RHPA 1X.5X10X50X6          |                                                                                     |  |                               |
| 1                                   | 0.5                             | 45                                 | 0.80                                 | 12.00                              | 4                                  | 0.95                            | 12.48                                                                                                                                                      | 12.90 | 13.34 | 13.83 | 14.91 | 441628    | 431RHPA 1X.5X12X45X4          |                                                                                     |  |                               |
| 1                                   | 0.5                             | 50                                 | 0.80                                 | 12.00                              | 6                                  | 0.95                            | 12.48                                                                                                                                                      | 12.90 | 13.34 | 13.83 | 14.91 | 441629    | 431RHPA 1X.5X12X50X6          |                                                                                     |  |                               |
| 1                                   | 0.5                             | 45                                 | 0.80                                 | 14.00                              | 4                                  | 0.95                            | 14.55                                                                                                                                                      | 15.04 | 15.56 | 16.13 | 17.39 | 441630    | 431RHPA 1X.5X14X45X4          |                                                                                     |  |                               |
| 1                                   | 0.5                             | 50                                 | 0.80                                 | 16.00                              | 4                                  | 0.95                            | 16.61                                                                                                                                                      | 17.17 | 17.78 | 18.43 | 19.88 | 441631    | 431RHPA 1X.5X16X50X4          |                                                                                     |  |                               |
| 1                                   | 0.5                             | 60                                 | 0.80                                 | 16.00                              | 6                                  | 0.95                            | 16.61                                                                                                                                                      | 17.17 | 17.78 | 18.43 | 19.88 | 441632    | 431RHPA 1X.5X16X60X6          |                                                                                     |  |                               |
| 1                                   | 0.5                             | 50                                 | 0.80                                 | 18.00                              | 4                                  | 0.95                            | 18.68                                                                                                                                                      | 19.31 | 19.99 | 20.72 | 22.37 | 441633    | 431RHPA 1X.5X18X50X4          |                                                                                     |  |                               |
| 1                                   | 0.5                             | 50                                 | 0.80                                 | 20.00                              | 4                                  | 0.95                            | 20.75                                                                                                                                                      | 21.45 | 22.21 | 23.02 | 24.85 | 441634    | 431RHPA 1X.5X20X50X4          |                                                                                     |  |                               |
| 1                                   | 0.5                             | 60                                 | 0.80                                 | 20.00                              | 6                                  | 0.95                            | 20.75                                                                                                                                                      | 21.45 | 22.21 | 23.02 | 24.85 | 441635    | 431RHPA 1X.5X20X60X6          |                                                                                     |  |                               |
| 1.2                                 | 0.6                             | 45                                 | 1.20                                 | 4.00                               | 4                                  | 1.14                            | 4.23                                                                                                                                                       | 4.35  | 4.49  | 4.63  | 4.96  | 441636    | 431RHPA 1.2X.6X4X45X4         |                                                                                     |  |                               |
| 1.2                                 | 0.6                             | 45                                 | 1.20                                 | 6.00                               | 4                                  | 1.14                            | 6.29                                                                                                                                                       | 6.49  | 6.70  | 6.93  | 7.45  | 441637    | 431RHPA 1.2X.6X6X45X4         |                                                                                     |  |                               |
| 1.2                                 | 0.6                             | 45                                 | 1.20                                 | 8.00                               | 4                                  | 1.14                            | 8.36                                                                                                                                                       | 8.63  | 8.92  | 9.23  | 9.93  | 441638    | 431RHPA 1.2X.6X8X45X4         |                                                                                     |  |                               |
| 1.2                                 | 0.6                             | 45                                 | 1.20                                 | 10.00                              | 4                                  | 1.14                            | 10.43                                                                                                                                                      | 10.77 | 11.14 | 11.53 | 12.42 | 441639    | 431RHPA 1.2X.6X10X45X4        |                                                                                     |  |                               |
| 1.2                                 | 0.6                             | 45                                 | 1.20                                 | 12.00                              | 4                                  | 1.14                            | 12.49                                                                                                                                                      | 12.91 | 13.35 | 13.83 | 14.91 | 441640    | 431RHPA 1.2X.6X12X45X4        |                                                                                     |  |                               |
| 1.2                                 | 0.6                             | 50                                 | 1.20                                 | 16.00                              | 4                                  | 1.14                            | 16.63                                                                                                                                                      | 17.19 | 17.79 | 18.43 | 19.88 | 441641    | 431RHPA 1.2X.6X16X50X4        |                                                                                     |  |                               |
| 1.2                                 | 0.6                             | 50                                 | 1.20                                 | 20.00                              | 4                                  | 1.14                            | 20.76                                                                                                                                                      | 21.47 | 22.22 | 23.03 | 24.85 | 441642    | 431RHPA 1.2X.6X20X50X4        |                                                                                     |  |                               |
| 1.5                                 | 0.75                            | 45                                 | 1.35                                 | 3.00                               | 4                                  | 1.44                            | 3.19                                                                                                                                                       | 3.27  | 3.36  | 3.46  | 3.68  | 441643    | 431RHPA 1.5X.75X3X45X4        |                                                                                     |  |                               |
| 1.5                                 | 0.75                            | 45                                 | 1.35                                 | 4.00                               | 4                                  | 1.44                            | 4.22                                                                                                                                                       | 4.34  | 4.47  | 4.61  | 4.92  | 441644    | 431RHPA 1.5X.75X4X45X4        |                                                                                     |  |                               |
| 1.5                                 | 0.75                            | 50                                 | 1.35                                 | 4.00                               | 6                                  | 1.44                            | 4.22                                                                                                                                                       | 4.34  | 4.47  | 4.61  | 4.92  | 441645    | 431RHPA 1.5X.75X4X50X6        |                                                                                     |  |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page &gt;&gt;

 Per Acciai Temprati ≤55 HRC  
For Hardened Steels ≤55 HRC

Frese sferiche con scarico in metallo duro integrale micrograna.  
Ball nose long neck end mills in solid carbide micro grain.

| 431RHPA                             |                                 |                                    |                                      |                                    |                                    |                                 |                                                                                                                                                            |       |       |       |        | 431RHPA   |                               |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|--------|-----------|-------------------------------|-------------------------------|
| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |       |       |        | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30°                                                                                                                                                        | 1°    | 1°30' | 2°    | 3°     |           |                               | €                             |
| 1.5                                 | 0.75                            | 45                                 | 1.35                                 | 6.00                               | 4                                  | 1.44                            | 6.29                                                                                                                                                       | 6.48  | 6.69  | 6.91  | 7.41   | 441646    | 431RHPA 1.5X.75X6X45X4        |                               |
| 1.5                                 | 0.75                            | 50                                 | 1.35                                 | 6.00                               | 6                                  | 1.44                            | 6.29                                                                                                                                                       | 6.48  | 6.69  | 6.91  | 7.41   | 441647    | 431RHPA 1.5X.75X6X50X6        |                               |
| 1.5                                 | 0.75                            | 45                                 | 1.35                                 | 8.00                               | 4                                  | 1.44                            | 8.35                                                                                                                                                       | 8.62  | 8.90  | 9.21  | 9.90   | 441648    | 431RHPA 1.5X.75X8X45X4        |                               |
| 1.5                                 | 0.75                            | 50                                 | 1.35                                 | 8.00                               | 6                                  | 1.44                            | 8.35                                                                                                                                                       | 8.62  | 8.90  | 9.21  | 9.90   | 441649    | 431RHPA 1.5X.75X8X50X6        |                               |
| 1.5                                 | 0.75                            | 45                                 | 1.35                                 | 10.00                              | 4                                  | 1.44                            | 10.42                                                                                                                                                      | 10.76 | 11.12 | 11.51 | 12.38  | 441650    | 431RHPA 1.5X.75X10X45X4       |                               |
| 1.5                                 | 0.75                            | 50                                 | 1.35                                 | 10.00                              | 6                                  | 1.44                            | 10.42                                                                                                                                                      | 10.76 | 11.12 | 11.51 | 12.38  | 441651    | 431RHPA 1.5X.75X10X50X6       |                               |
| 1.5                                 | 0.75                            | 45                                 | 1.35                                 | 12.00                              | 4                                  | 1.44                            | 12.49                                                                                                                                                      | 12.90 | 13.34 | 13.81 | 14.87  | 441652    | 431RHPA 1.5X.75X12X45X4       |                               |
| 1.5                                 | 0.75                            | 50                                 | 1.35                                 | 12.00                              | 6                                  | 1.44                            | 12.49                                                                                                                                                      | 12.90 | 13.34 | 13.81 | 14.87  | 441653    | 431RHPA 1.5X.75X12X50X6       |                               |
| 1.5                                 | 0.75                            | 45                                 | 1.35                                 | 14.00                              | 4                                  | 1.44                            | 14.56                                                                                                                                                      | 15.04 | 15.55 | 16.11 | 17.36  | 441654    | 431RHPA 1.5X.75X14X45X4       |                               |
| 1.5                                 | 0.75                            | 50                                 | 1.35                                 | 16.00                              | 4                                  | 1.44                            | 16.62                                                                                                                                                      | 17.18 | 17.77 | 18.41 | 19.84  | 441655    | 431RHPA 1.5X.75X16X50X4       |                               |
| 1.5                                 | 0.75                            | 60                                 | 1.35                                 | 16.00                              | 6                                  | 1.44                            | 16.62                                                                                                                                                      | 17.18 | 17.77 | 18.41 | 19.84  | 441656    | 431RHPA 1.5X.75X16X60X6       |                               |
| 1.5                                 | 0.75                            | 50                                 | 1.35                                 | 20.00                              | 4                                  | 1.44                            | 20.76                                                                                                                                                      | 21.46 | 22.20 | 23.01 | libero | 441657    | 431RHPA 1.5X.75X20X50X4       |                               |
| 1.5                                 | 0.75                            | 60                                 | 1.35                                 | 20.00                              | 6                                  | 1.44                            | 20.76                                                                                                                                                      | 21.46 | 22.20 | 23.01 | 24.81  | 441658    | 431RHPA 1.5X.75X20X60X6       |                               |
| 1.5                                 | 0.75                            | 60                                 | 1.35                                 | 25.00                              | 4                                  | 1.44                            | 25.93                                                                                                                                                      | 26.80 | 27.75 | 28.76 | libero | 441659    | 431RHPA 1.5X.75X25X60X4       |                               |
| 1.5                                 | 0.75                            | 70                                 | 1.35                                 | 30.00                              | 4                                  | 1.44                            | 31.10                                                                                                                                                      | 32.15 | 33.29 | 34.51 | libero | 441660    | 431RHPA 1.5X.75X30X70X4       |                               |
| 1.6                                 | 0.8                             | 45                                 | 1.60                                 | 6.00                               | 4                                  | 1.55                            | 6.27                                                                                                                                                       | 6.46  | 6.66  | 6.88  | 7.38   | 441661    | 431RHPA 1.6X.8X6X45X4         |                               |
| 1.6                                 | 0.8                             | 45                                 | 1.60                                 | 8.00                               | 4                                  | 1.55                            | 8.33                                                                                                                                                       | 8.60  | 8.88  | 9.18  | 9.86   | 441662    | 431RHPA 1.6X.8X8X45X4         |                               |
| 1.6                                 | 0.8                             | 45                                 | 1.60                                 | 10.00                              | 4                                  | 1.55                            | 10.40                                                                                                                                                      | 10.74 | 11.09 | 11.48 | 12.35  | 441663    | 431RHPA 1.6X.8X10X45X4        |                               |
| 1.6                                 | 0.8                             | 45                                 | 1.60                                 | 12.00                              | 4                                  | 1.55                            | 12.47                                                                                                                                                      | 12.88 | 13.31 | 13.78 | 14.83  | 441664    | 431RHPA 1.6X.8X12X45X4        |                               |
| 1.6                                 | 0.8                             | 50                                 | 1.60                                 | 16.00                              | 4                                  | 1.55                            | 16.60                                                                                                                                                      | 17.15 | 17.74 | 18.38 | 19.81  | 441665    | 431RHPA 1.6X.8X16X50X4        |                               |
| 1.6                                 | 0.8                             | 50                                 | 1.60                                 | 20.00                              | 4                                  | 1.55                            | 20.74                                                                                                                                                      | 21.43 | 22.18 | 22.98 | libero | 441666    | 431RHPA 1.6X.8X20X50X4        |                               |
| 2                                   | 1                               | 45                                 | 1.80                                 | 4.00                               | 4                                  | 1.92                            | 4.25                                                                                                                                                       | 4.36  | 4.49  | 4.62  | 4.91   | 441667    | 431RHPA 2X1X4X45X4            |                               |
| 2                                   | 1                               | 45                                 | 1.80                                 | 5.00                               | 4                                  | 1.92                            | 5.28                                                                                                                                                       | 5.43  | 5.59  | 5.77  | 6.15   | 441668    | 431RHPA 2X1X5X45X4            |                               |
| 2                                   | 1                               | 45                                 | 1.80                                 | 6.00                               | 4                                  | 1.92                            | 6.32                                                                                                                                                       | 6.50  | 6.70  | 6.92  | 7.40   | 441669    | 431RHPA 2X1X6X45X4            |                               |
| 2                                   | 1                               | 50                                 | 1.80                                 | 6.00                               | 6                                  | 1.92                            | 6.32                                                                                                                                                       | 6.50  | 6.70  | 6.92  | 7.40   | 441670    | 431RHPA 2X1X6X50X6            |                               |
| 2                                   | 1                               | 45                                 | 1.80                                 | 8.00                               | 4                                  | 1.92                            | 8.38                                                                                                                                                       | 8.64  | 8.92  | 9.22  | 9.88   | 441671    | 431RHPA 2X1X8X45X4            |                               |
| 2                                   | 1                               | 50                                 | 1.80                                 | 8.00                               | 6                                  | 1.92                            | 8.38                                                                                                                                                       | 8.64  | 8.92  | 9.22  | 9.88   | 441672    | 431RHPA 2X1X8X50X6            |                               |
| 2                                   | 1                               | 45                                 | 1.80                                 | 10.00                              | 4                                  | 1.92                            | 10.45                                                                                                                                                      | 10.78 | 11.14 | 11.52 | 12.37  | 441673    | 431RHPA 2X1X10X45X4           |                               |
| 2                                   | 1                               | 50                                 | 1.80                                 | 10.00                              | 6                                  | 1.92                            | 10.45                                                                                                                                                      | 10.78 | 11.14 | 11.52 | 12.37  | 441674    | 431RHPA 2X1X10X50X6           |                               |
| 2                                   | 1                               | 45                                 | 1.80                                 | 12.00                              | 4                                  | 1.92                            | 12.52                                                                                                                                                      | 12.92 | 13.35 | 13.82 | 14.86  | 441675    | 431RHPA 2X1X12X45X4           |                               |
| 2                                   | 1                               | 50                                 | 1.80                                 | 12.00                              | 6                                  | 1.92                            | 12.52                                                                                                                                                      | 12.92 | 13.35 | 13.82 | 14.86  | 441676    | 431RHPA 2X1X12X50X6           |                               |
| 2                                   | 1                               | 45                                 | 1.80                                 | 14.00                              | 4                                  | 1.92                            | 14.59                                                                                                                                                      | 15.06 | 15.57 | 16.11 | 17.34  | 441677    | 431RHPA 2X1X14X45X4           |                               |
| 2                                   | 1                               | 50                                 | 1.80                                 | 16.00                              | 4                                  | 1.92                            | 16.65                                                                                                                                                      | 17.20 | 17.79 | 18.41 | 19.83  | 441678    | 431RHPA 2X1X16X50X4           |                               |
| 2                                   | 1                               | 60                                 | 1.80                                 | 16.00                              | 6                                  | 1.92                            | 16.65                                                                                                                                                      | 17.20 | 17.79 | 18.41 | 19.83  | 441679    | 431RHPA 2X1X16X60X6           |                               |
| 2                                   | 1                               | 50                                 | 1.80                                 | 18.00                              | 4                                  | 1.92                            | 18.72                                                                                                                                                      | 19.34 | 20.00 | 20.71 | libero | 441680    | 431RHPA 2X1X18X50X4           |                               |
| 2                                   | 1                               | 50                                 | 1.80                                 | 20.00                              | 4                                  | 1.92                            | 20.79                                                                                                                                                      | 21.48 | 22.22 | 23.01 | libero | 441681    | 431RHPA 2X1X20X50X4           |                               |
| 2                                   | 1                               | 60                                 | 1.80                                 | 20.00                              | 6                                  | 1.92                            | 20.79                                                                                                                                                      | 21.48 | 22.22 | 23.01 | 24.80  | 441682    | 431RHPA 2X1X20X60X6           |                               |
| 2                                   | 1                               | 60                                 | 1.80                                 | 25.00                              | 4                                  | 1.92                            | 25.96                                                                                                                                                      | 26.83 | 27.76 | 28.76 | libero | 441683    | 431RHPA 2X1X25X60X4           |                               |
| 2                                   | 1                               | 60                                 | 1.80                                 | 25.00                              | 6                                  | 1.92                            | 25.96                                                                                                                                                      | 26.83 | 27.76 | 28.76 | 31.02  | 441684    | 431RHPA 2X1X25X60X6           |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |    |       |    |    |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-------|----|----|
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30°                                                                                                                                                        | 1° | 1°30' | 2° | 3° |

| 431RHPA   |                               |                                                                                     |                               |
|-----------|-------------------------------|-------------------------------------------------------------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code |  | Prezzo utensile<br>Tool Price |
|           |                               |                                                                                     | €                             |

|     |      |     |      |       |   |      |        |        |        |        |        |
|-----|------|-----|------|-------|---|------|--------|--------|--------|--------|--------|
| 2   | 1    | 70  | 1.80 | 30.00 | 4 | 1.92 | 31.13  | 32.18  | 33.30  | libero | libero |
| 2   | 1    | 70  | 1.80 | 35.00 | 4 | 1.92 | 36.29  | 37.52  | 38.84  | libero | libero |
| 2   | 1    | 80  | 1.80 | 40.00 | 4 | 1.92 | 41.46  | 42.87  | libero | libero | libero |
| 2.5 | 1.25 | 45  | 2.50 | 8.00  | 4 | 2.39 | 8.43   | 8.68   | 8.95   | 9.24   | 9.89   |
| 2.5 | 1.25 | 45  | 2.50 | 10.00 | 4 | 2.39 | 10.50  | 10.82  | 11.17  | 11.54  | 12.38  |
| 2.5 | 1.25 | 45  | 2.50 | 12.00 | 4 | 2.39 | 12.57  | 12.96  | 13.39  | 13.84  | 14.86  |
| 2.5 | 1.25 | 50  | 2.50 | 16.00 | 4 | 2.39 | 16.70  | 17.24  | 17.82  | 18.44  | libero |
| 2.5 | 1.25 | 50  | 2.50 | 20.00 | 4 | 2.39 | 20.84  | 21.52  | 22.25  | libero | libero |
| 2.5 | 1.25 | 60  | 2.50 | 25.00 | 4 | 2.39 | 26.01  | 26.87  | 27.79  | libero | libero |
| 3   | 1.5  | 50  | 3.00 | 6.00  | 6 | 2.86 | 6.42   | 6.59   | 6.77   | 6.97   | 7.41   |
| 3   | 1.5  | 50  | 3.00 | 8.00  | 6 | 2.86 | 8.48   | 8.73   | 8.99   | 9.27   | 9.90   |
| 3   | 1.5  | 50  | 3.00 | 10.00 | 6 | 2.86 | 10.55  | 10.87  | 11.21  | 11.57  | 12.39  |
| 3   | 1.5  | 50  | 3.00 | 12.00 | 6 | 2.86 | 12.62  | 13.01  | 13.42  | 13.87  | 14.87  |
| 3   | 1.5  | 50  | 3.00 | 14.00 | 6 | 2.86 | 14.69  | 15.15  | 15.64  | 16.17  | 17.36  |
| 3   | 1.5  | 60  | 3.00 | 16.00 | 6 | 2.86 | 16.75  | 17.28  | 17.86  | 18.47  | 19.85  |
| 3   | 1.5  | 60  | 3.00 | 18.00 | 6 | 2.86 | 18.82  | 19.42  | 20.07  | 20.77  | 22.33  |
| 3   | 1.5  | 60  | 3.00 | 20.00 | 6 | 2.86 | 20.89  | 21.56  | 22.29  | 23.07  | 24.82  |
| 3   | 1.5  | 60  | 3.00 | 25.00 | 6 | 2.86 | 26.06  | 26.91  | 27.83  | 28.82  | libero |
| 3   | 1.5  | 70  | 3.00 | 30.00 | 6 | 2.86 | 31.22  | 32.26  | 33.37  | 34.57  | libero |
| 3   | 1.5  | 70  | 3.00 | 35.00 | 6 | 2.86 | 36.39  | 37.61  | 38.91  | 40.32  | libero |
| 3   | 1.5  | 80  | 3.00 | 40.00 | 6 | 2.86 | 41.56  | 42.96  | 44.45  | libero | libero |
| 3   | 1.5  | 100 | 3.00 | 50.00 | 6 | 2.86 | 51.90  | 53.65  | 55.54  | libero | libero |
| 3.5 | 1.75 | 60  | 3.50 | 15.00 | 6 | 3.35 | 15.73  | 16.22  | 16.74  | 17.30  | 18.56  |
| 3.5 | 1.75 | 60  | 3.50 | 20.00 | 6 | 3.35 | 20.90  | 21.57  | 22.28  | 23.05  | 24.78  |
| 3.5 | 1.75 | 60  | 3.50 | 25.00 | 6 | 3.35 | 26.07  | 26.91  | 27.82  | 28.80  | libero |
| 3.5 | 1.75 | 70  | 3.50 | 30.00 | 6 | 3.35 | 31.24  | 32.26  | 33.37  | 34.55  | libero |
| 3.5 | 1.75 | 80  | 3.50 | 40.00 | 6 | 3.35 | 41.57  | 42.96  | 44.45  | libero | libero |
| 4   | 2    | 50  | 4.00 | 10.00 | 6 | 3.80 | 10.65  | 10.95  | 11.28  | 11.62  | 12.40  |
| 4   | 2    | 50  | 4.00 | 12.00 | 6 | 3.80 | 12.72  | 13.09  | 13.49  | 13.92  | 14.89  |
| 4   | 2    | 60  | 4.00 | 16.00 | 6 | 3.80 | 16.85  | 17.37  | 17.93  | 18.52  | 19.86  |
| 4   | 2    | 60  | 4.00 | 20.00 | 6 | 3.80 | 20.99  | 21.65  | 22.36  | 23.12  | libero |
| 4   | 2    | 60  | 4.00 | 25.00 | 6 | 3.80 | 26.16  | 27.00  | 27.90  | 28.87  | libero |
| 4   | 2    | 70  | 4.00 | 30.00 | 6 | 3.80 | 31.32  | 32.35  | 33.44  | libero | libero |
| 4   | 2    | 70  | 4.00 | 35.00 | 6 | 3.80 | 36.49  | 37.69  | 38.98  | libero | libero |
| 4   | 2    | 80  | 4.00 | 40.00 | 6 | 3.80 | 41.66  | 43.04  | libero | libero | libero |
| 4   | 2    | 100 | 4.00 | 50.00 | 6 | 3.80 | 52.00  | 53.74  | libero | libero | libero |
| 6   | 3    | 60  | 7.00 | 15.00 | 6 | 5.70 | libero | libero | libero | libero | libero |
| 6   | 3    | 60  | 7.00 | 20.00 | 6 | 5.70 | libero | libero | libero | libero | libero |
| 6   | 3    | 110 | 7.00 | 30.00 | 6 | 5.70 | libero | libero | libero | libero | libero |

|        |         |                  |
|--------|---------|------------------|
| 441685 | 431RHPA | 2X1X30X70X4      |
| 441686 | 431RHPA | 2X1X35X70X4      |
| 441687 | 431RHPA | 2X1X40X80X4      |
| 441688 | 431RHPA | 2.5X1.25X8X45X4  |
| 441689 | 431RHPA | 2.5X1.25X10X45X4 |
| 441690 | 431RHPA | 2.5X1.25X12X45X4 |
| 441691 | 431RHPA | 2.5X1.25X16X50X4 |
| 441692 | 431RHPA | 2.5X1.25X20X50X4 |
| 441693 | 431RHPA | 2.5X1.25X25X60X4 |
| 441694 | 431RHPA | 3X1.5X6X50X6     |
| 441695 | 431RHPA | 3X1.5X8X50X6     |
| 441696 | 431RHPA | 3X1.5X10X50X6    |
| 441697 | 431RHPA | 3X1.5X12X50X6    |
| 441698 | 431RHPA | 3X1.5X14X50X6    |
| 441699 | 431RHPA | 3X1.5X16X60X6    |
| 441700 | 431RHPA | 3X1.5X18X60X6    |
| 441701 | 431RHPA | 3X1.5X20X60X6    |
| 441702 | 431RHPA | 3X1.5X25X60X6    |
| 441703 | 431RHPA | 3X1.5X30X70X6    |
| 441704 | 431RHPA | 3X1.5X35X70X6    |
| 441705 | 431RHPA | 3X1.5X40X80X6    |
| 441706 | 431RHPA | 3X1.5X50X100X6   |
| 441707 | 431RHPA | 3.5X1.75X15X60X6 |
| 441708 | 431RHPA | 3.5X1.75X20X60X6 |
| 441709 | 431RHPA | 3.5X1.75X25X60X6 |
| 441710 | 431RHPA | 3.5X1.75X30X70X6 |
| 441711 | 431RHPA | 3.5X1.75X40X80X6 |
| 441712 | 431RHPA | 4X2X10X50X6      |
| 441713 | 431RHPA | 4X2X12X50X6      |
| 441714 | 431RHPA | 4X2X16X60X6      |
| 441715 | 431RHPA | 4X2X20X60X6      |
| 441716 | 431RHPA | 4X2X25X60X6      |
| 441717 | 431RHPA | 4X2X30X70X6      |
| 441718 | 431RHPA | 4X2X35X70X6      |
| 441719 | 431RHPA | 4X2X40X80X6      |
| 441720 | 431RHPA | 4X2X50X100X6     |
| 441721 | 431RHPA | 6X3X15X60X6      |
| 441722 | 431RHPA | 6X3X20X60X6      |
| 441723 | 431RHPA | 6X3X30X110X6     |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

Per Acciai Temprati ≤55 HRC  
For Hardened Steels ≤55 HRC

Frese sferiche con scarico in metallo duro integrale micrograna.  
Ball nose long neck end mills in solid carbide micro grain.

| 431RHPA                             |                                 |                                    |                                      |                                    |                                    |                                 |                                                                                                                                                            |        |        |        |        | 431RHPA   |                               |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--------|--------|-----------|-------------------------------|-------------------------------|
| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |        |        |        |        | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30°                                                                                                                                                        | 1°     | 1°30'  | 2°     | 3°     |           |                               | €                             |
| 8                                   | 4                               | 60                                 | 10.00                                | 20.00                              | 8                                  | 7.60                            | libero                                                                                                                                                     | libero | libero | libero | libero | 441724    | 431RHPA 8X4X10X60X8           |                               |
| 8                                   | 4                               | 100                                | 10.00                                | 30.00                              | 8                                  | 7.60                            | libero                                                                                                                                                     | libero | libero | libero | libero | 441725    | 431RHPA 8X4X30X100X8          |                               |
| 10                                  | 5                               | 70                                 | 12.00                                | 25.00                              | 10                                 | 9.50                            | libero                                                                                                                                                     | libero | libero | libero | libero | 441726    | 431RHPA 10X5X25X70X10         |                               |
| 10                                  | 5                               | 100                                | 12.00                                | 35.00                              | 10                                 | 9.50                            | libero                                                                                                                                                     | libero | libero | libero | libero | 441727    | 431RHPA 10X5X35X100X10        |                               |
| 12                                  | 6                               | 80                                 | 14.00                                | 30.00                              | 12                                 | 11.50                           | libero                                                                                                                                                     | libero | libero | libero | libero | 441728    | 431RHPA 12X6X30X80X12         |                               |
| 12                                  | 6                               | 110                                | 14.00                                | 40.00                              | 12                                 | 11.50                           | libero                                                                                                                                                     | libero | libero | libero | libero | 441729    | 431RHPA 12X6X40X110X12        |                               |

## 1412HPA

Z2

Frese a testa piana in Metallo Duro Integrale micrograna.  
Square end mills in solid carbide micro grain.



| Durezza<br>Hardness | Acciai Temprati<br>Hardened Steels |                            |                        |                        |                             |                            |                        |                        |                             |                            |                        |                        |
|---------------------|------------------------------------|----------------------------|------------------------|------------------------|-----------------------------|----------------------------|------------------------|------------------------|-----------------------------|----------------------------|------------------------|------------------------|
|                     | ≤ 45 HRc                           |                            |                        |                        |                             |                            |                        |                        | ≤ 55 HRc                    |                            |                        |                        |
|                     | n<br>(min <sup>-1</sup> )          | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> )   | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> )   | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |
| d <sub>1</sub>      | Fresatura di cave   Slot Milling   |                            |                        |                        | Contornatura   Side Milling |                            |                        |                        | Contornatura   Side Milling |                            |                        |                        |
| 0.5                 | 45.000                             | 280                        | 0,050                  | 0,500                  | 45.000                      | 280                        | 0,050                  | 0,250                  | 40.000                      | 220                        | 0,025                  | 0,250                  |
| 1                   | 38.000                             | 570                        | 0,100                  | 1,000                  | 38.000                      | 570                        | 0,100                  | 0,500                  | 25.500                      | 360                        | 0,050                  | 0,500                  |
| 2                   | 26.000                             | 680                        | 0,200                  | 2,000                  | 26.000                      | 680                        | 0,200                  | 1,000                  | 17.500                      | 420                        | 0,100                  | 1,000                  |
| 3                   | 17.300                             | 680                        | 0,300                  | 3,000                  | 17.300                      | 680                        | 0,300                  | 1,500                  | 11.000                      | 420                        | 0,150                  | 1,500                  |
| 4                   | 13.200                             | 700                        | 0,400                  | 4,000                  | 13.200                      | 700                        | 0,400                  | 2,000                  | 8.800                       | 440                        | 0,200                  | 2,000                  |
| 5                   | 12.500                             | 805                        | 0,500                  | 5,000                  | 12.500                      | 805                        | 0,500                  | 2,500                  | 8.300                       | 500                        | 0,250                  | 2,500                  |
| 6                   | 10.300                             | 770                        | 0,600                  | 6,000                  | 10.300                      | 770                        | 0,600                  | 3,000                  | 6.900                       | 480                        | 0,300                  | 3,000                  |
| 8                   | 7.800                              | 720                        | 0,800                  | 8,000                  | 7.800                       | 720                        | 0,800                  | 4,000                  | 5.200                       | 445                        | 0,400                  | 4,000                  |
| 10                  | 6.150                              | 680                        | 1,000                  | 10,000                 | 6.150                       | 680                        | 1,000                  | 5,000                  | 4.100                       | 415                        | 0,500                  | 5,000                  |
| 12                  | 5.250                              | 680                        | 1,200                  | 12,000                 | 5.250                       | 680                        | 1,200                  | 6,000                  | 3.500                       | 415                        | 0,600                  | 6,000                  |

• Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

## 1414HPA

Z4

Frese a testa piana in metallo duro integrale micrograna.  
Square end mills in solid carbide micro grain.



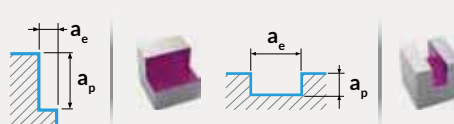
| Durezza<br>Hardness                                                                                                 | Acciai Temprati<br>Hardened Steels                                |                            |                        |                        |                           |                            |                        |                        |
|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|
|                                                                                                                     | ≤ 45 HRc                                                          |                            |                        |                        | ≤ 55 HRc                  |                            |                        |                        |
|                                                                                                                     | n<br>(min <sup>-1</sup> )                                         | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |
| d <sub>1</sub>                                                                                                      | Valori in tabella per contornatura   Table value for side Milling |                            |                        |                        |                           |                            |                        |                        |
| 1,0                                                                                                                 | 7.500                                                             | 140                        | 2,50                   | 0,050                  | 5.500                     | 50                         | 2                      | 0,02                   |
| 1,5                                                                                                                 | 7.000                                                             | 150                        | 3,75                   | 0,075                  | 5.000                     | 55                         | 3                      | 0,03                   |
| 2,0                                                                                                                 | 6.800                                                             | 160                        | 5,00                   | 0,100                  | 4.500                     | 60                         | 4                      | 0,04                   |
| 3,0                                                                                                                 | 4.900                                                             | 180                        | 7,50                   | 0,150                  | 3.000                     | 75                         | 6                      | 0,06                   |
| 4,0                                                                                                                 | 4.000                                                             | 300                        | 10,00                  | 0,200                  | 2.500                     | 100                        | 8                      | 0,08                   |
| 5,0                                                                                                                 | 3.200                                                             | 320                        | 12,50                  | 0,250                  | 2.000                     | 110                        | 10                     | 0,10                   |
| 6,0                                                                                                                 | 3.000                                                             | 320                        | 15,00                  | 0,300                  | 1.800                     | 120                        | 12                     | 0,12                   |
| 8,0                                                                                                                 | 2.100                                                             | 320                        | 20,00                  | 0,400                  | 1.400                     | 150                        | 16                     | 0,16                   |
| 10,0                                                                                                                | 1.700                                                             | 260                        | 25,00                  | 0,500                  | 1.200                     | 130                        | 20                     | 0,20                   |
| 12,0                                                                                                                | 1.400                                                             | 220                        | 30,00                  | 0,600                  | 1.000                     | 120                        | 24                     | 0,24                   |
| ↓ Valori (a <sub>p</sub> ) (a <sub>e</sub> ) per cave   Values (a <sub>p</sub> ) (a <sub>e</sub> ) for Slot Milling |                                                                   |                            |                        |                        |                           |                            |                        |                        |
|                                                                                                                     |                                                                   |                            |                        |                        |                           |                            |                        |                        |

• Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

## 1360HPA

Z6

Frese a testa piana in metallo duro integrale micrograna.  
Square end mills in solid carbide micro grain.



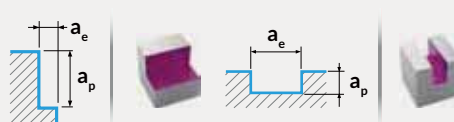
|                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Acciai Temprati<br>Hardened Steels |                            |                        |                        |                           |                            |                        |                        |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|--|
| Durezza<br>Hardness                                                                                                                                                                                                                                                                                                                                                                                                                                    | ≤ 45 HRc                           |                            |                        |                        | ≤ 55 HRc                  |                            |                        |                        |  |
| d <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                         | n<br>(min <sup>-1</sup> )          | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |  |
| Valori in tabella per contornatura   Table value for side Milling                                                                                                                                                                                                                                                                                                                                                                                      |                                    |                            |                        |                        |                           |                            |                        |                        |  |
| 1,0                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 7.500                              | 140                        | 2,50                   | 0,050                  | 5.500                     | 50                         | 2                      | 0,02                   |  |
| 1,5                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 7.000                              | 150                        | 3,75                   | 0,075                  | 5.000                     | 55                         | 3                      | 0,03                   |  |
| 2,0                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 6.800                              | 160                        | 5,00                   | 0,100                  | 4.500                     | 60                         | 4                      | 0,04                   |  |
| 3,0                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4.900                              | 180                        | 7,50                   | 0,150                  | 3.000                     | 75                         | 6                      | 0,06                   |  |
| 4,0                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4.000                              | 300                        | 10,00                  | 0,200                  | 2.500                     | 100                        | 8                      | 0,08                   |  |
| 5,0                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 3.200                              | 320                        | 12,50                  | 0,250                  | 2.000                     | 110                        | 10                     | 0,10                   |  |
| 6,0                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 3.000                              | 320                        | 15,00                  | 0,300                  | 1.800                     | 120                        | 12                     | 0,12                   |  |
| 8,0                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2.100                              | 320                        | 20,00                  | 0,400                  | 1.400                     | 150                        | 16                     | 0,16                   |  |
| 10,0                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1.700                              | 260                        | 25,00                  | 0,500                  | 1.200                     | 130                        | 20                     | 0,20                   |  |
| 12,0                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1.400                              | 220                        | 30,00                  | 0,600                  | 1.000                     | 120                        | 24                     | 0,24                   |  |
| ↓ Valori (a <sub>p</sub> ) (a <sub>e</sub> ) per cave   Values (a <sub>p</sub> ) (a <sub>e</sub> ) for Slot Milling                                                                                                                                                                                                                                                                                                                                    |                                    |                            |                        |                        |                           |                            |                        |                        |  |
| <div> <div> <div> <math>a_e (1xD)</math><br/> <math>a_p</math> </div> </div> <div> <math>\leq 0.05D (\varnothing 1)</math><br/> <math>\leq 0.1D (\varnothing 1 - \varnothing 2)</math><br/> <math>\leq 0.15D (\varnothing 2 - \varnothing 3)</math><br/> <math>\leq 0.3D (D &gt; \varnothing 3)</math><br/> (Max 0.5 mm) </div> </div> <div> <div> <math>a_e (1xD)</math><br/> <math>a_p</math> </div> <div> <math>a_p \leq 0.05D</math> </div> </div> |                                    |                            |                        |                        |                           |                            |                        |                        |  |

- Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

## 1430HPA

Z2

Frese a testa piana con scarico in Metallo Duro Integrale micrograna.  
Square end mills long neck in solid carbide micro grain.



|                                                                   | Acciai Temprati<br>Hardened Steels |                            |                        |                        |                           |                            |                        |                        |  |
|-------------------------------------------------------------------|------------------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|--|
| Durezza<br>Hardness                                               | ≤ 45 HRC                           |                            |                        |                        | ≤ 55 HRC                  |                            |                        |                        |  |
| R + I <sub>3</sub>                                                | n<br>(min <sup>-1</sup> )          | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |  |
| Valori in tabella per contornatura   Table value for side Milling |                                    |                            |                        |                        |                           |                            |                        |                        |  |

|     |      |        |     |       |       |        |     |       |       |
|-----|------|--------|-----|-------|-------|--------|-----|-------|-------|
| 0,2 | 0,5  | 56.000 | 270 | 0,003 | 0,160 | 44.800 | 180 | 0,002 | 0,144 |
| 0,3 | 1,0  | 60.000 | 400 | 0,006 | 0,100 | 52.100 | 330 | 0,004 | 0,090 |
| 0,4 | 1,0  | 48.100 | 470 | 0,008 | 0,055 | 38.500 | 320 | 0,005 | 0,050 |
| 0,5 | 2,0  | 40.600 | 510 | 0,014 | 0,095 | 32.500 | 350 | 0,010 | 0,085 |
| 0,8 | 6,0  | 19.800 | 370 | 0,010 | 0,025 | 15.800 | 250 | 0,007 | 0,020 |
| 1,0 | 10,0 | 13.800 | 300 | 0,007 | 0,015 | 11.000 | 210 | 0,012 | 0,012 |
| 1,5 | 10,0 | 11.200 | 390 | 0,021 | 0,065 | 8.900  | 270 | 0,055 | 0,055 |
| 2,0 | 10,0 | 9.700  | 470 | 0,031 | 0,200 | 7.800  | 330 | 0,020 | 0,180 |
| 2,5 | 10,0 | 8.600  | 590 | 0,048 | 0,450 | 6.900  | 400 | 0,034 | 0,430 |
| 3,0 | 10,0 | 7.200  | 620 | 0,064 | 1,000 | 5.800  | 430 | 0,046 | 0,900 |
| 4,0 | 12,0 | 5.100  | 600 | 0,080 | 1,800 | 4.100  | 410 | 0,050 | 1,600 |
| 5,0 | 30,0 | 2.500  | 340 | 0,066 | 0,280 | 2.000  | 230 | 0,047 | 0,260 |
| 6,0 | 40,0 | 1.700  | 260 | 0,058 | 0,250 | 1.300  | 170 | 0,041 | 0,228 |
| 8,0 | 40,0 | 1.500  | 250 | 0,080 | 0,200 | 1.100  | 160 | 0,060 | 0,180 |

- Per cave: valori (a<sub>p</sub> - n - V<sub>f</sub> riportati in tabella) per (a<sub>e</sub> 1xD), mantenendo giri e avanzamento riportati in tabella. Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti.
- For slot milling: values (a<sub>p</sub> - n - V<sub>f</sub> shown in table) for (a<sub>e</sub> 1xD), maintaining the RPM and feed shown in the table. Contact the technical department for more details on the missing diameters.

## 1414LHPA

Z4

Frese a testa piana serie lunga in Metallo Duro Integrale micrograna.  
Square end mills long series in solid carbide micro grain.



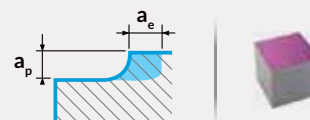
|                                                                                                                     | Acciai Temprati<br>Hardened Steels |                            |                        |                        |                           |                            |                        |                        |  |
|---------------------------------------------------------------------------------------------------------------------|------------------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|--|
| Durezza<br>Hardness                                                                                                 | ≤ 45 HRc                           |                            |                        |                        | ≤ 55 HRc                  |                            |                        |                        |  |
| d <sub>1</sub>                                                                                                      | n<br>(min <sup>-1</sup> )          | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |  |
| Valori in tabella per contornatura   Table value for side Milling                                                   |                                    |                            |                        |                        |                           |                            |                        |                        |  |
| 2                                                                                                                   | 6.800                              | 160                        | 5,0                    | 0,10                   | 4.500                     | 60                         | 4                      | 0,04                   |  |
| 3                                                                                                                   | 4.900                              | 180                        | 7,5                    | 0,15                   | 3.000                     | 75                         | 6                      | 0,06                   |  |
| 4                                                                                                                   | 4.000                              | 300                        | 10,0                   | 0,20                   | 2.500                     | 100                        | 8                      | 0,08                   |  |
| 5                                                                                                                   | 3.200                              | 320                        | 12,5                   | 0,25                   | 2.000                     | 110                        | 10                     | 0,10                   |  |
| 6                                                                                                                   | 3.000                              | 320                        | 15,0                   | 0,30                   | 1.800                     | 120                        | 12                     | 0,12                   |  |
| 8                                                                                                                   | 2.100                              | 320                        | 20,0                   | 0,40                   | 1.400                     | 150                        | 16                     | 0,16                   |  |
| 10                                                                                                                  | 1.700                              | 260                        | 25,0                   | 0,50                   | 1.200                     | 130                        | 20                     | 0,20                   |  |
| 12                                                                                                                  | 1.400                              | 220                        | 30,0                   | 0,60                   | 1.000                     | 120                        | 24                     | 0,24                   |  |
| ↓ Valori (a <sub>p</sub> ) (a <sub>e</sub> ) per cave   Values (a <sub>p</sub> ) (a <sub>e</sub> ) for Slot Milling |                                    |                            |                        |                        |                           |                            |                        |                        |  |
|                                                                                                                     |                                    |                            |                        |                        |                           |                            |                        |                        |  |
|                                                                                                                     |                                    |                            |                        |                        |                           |                            |                        |                        |  |

- Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

## 1440HPA

Z4

Frese toriche in metallo duro integrale micrograna.  
Corner radius end mills in solid carbide micro grain.



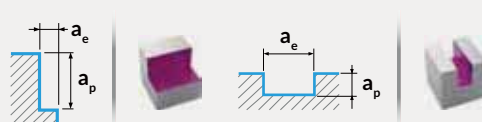
|                     | Acciai al carbonio-Acciai inossidabili<br>Carbon Steels-Alloy Steels |                            |                        |                        | Acciai Pretemprati-Temprati<br>Prehardened-Hardened Steels |                            |                        |                        | Acciai Temprati<br>Hardened Steels |                            |                        |                        |
|---------------------|----------------------------------------------------------------------|----------------------------|------------------------|------------------------|------------------------------------------------------------|----------------------------|------------------------|------------------------|------------------------------------|----------------------------|------------------------|------------------------|
| Durezza<br>Hardness | 30 HRc                                                               |                            |                        |                        | 30-45 HRc                                                  |                            |                        |                        | 45-55 HRc                          |                            |                        |                        |
| d <sub>1</sub> + R  | n<br>(min <sup>-1</sup> )                                            | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> )                                  | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> )          | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |
| 6,0 1,0             | 11.000                                                               | 13.000                     | 2,5                    | 0,25                   | 9.000                                                      | 11.000                     | 2,0                    | 0,15                   | 8.000                              | 9.600                      | 2,5                    | 0,10                   |
| 8,0 1,0             | 8.200                                                                | 13.000                     | 3,0                    | 0,30                   | 7.000                                                      | 11.000                     | 3,0                    | 0,20                   | 6.000                              | 9.600                      | 3,0                    | 0,15                   |
| 10,0 2,0            | 6.500                                                                | 13.000                     | 4,5                    | 0,30                   | 5.500                                                      | 11.000                     | 4,5                    | 0,20                   | 4.800                              | 9.500                      | 4,5                    | 0,15                   |
| 12,0 2,0            | 5.500                                                                | 12.000                     | 5,5                    | 0,30                   | 5.000                                                      | 10.000                     | 5,5                    | 0,20                   | 4.100                              | 9.000                      | 4,5                    | 0,25                   |

- Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

## 1434HPA

Z4

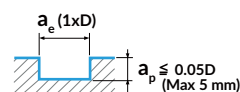
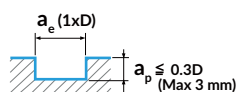
Frese toriche in metallo duro integrale micrograna.  
Corner radius end mills in solid carbide micro grain.



|                                                                   | Acciai Temprati<br>Hardened Steels |                            |                        |                        |                           |                            |                        |                        |  |
|-------------------------------------------------------------------|------------------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|--|
| Durezza<br>Hardness                                               | ≤ 45 HRc                           |                            |                        |                        | ≤ 55 HRc                  |                            |                        |                        |  |
| d <sub>1</sub> + R                                                | n<br>(min <sup>-1</sup> )          | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |  |
| Valori in tabella per contornatura   Table value for side Milling |                                    |                            |                        |                        |                           |                            |                        |                        |  |

|    |     |       |     |      |      |       |    |    |      |
|----|-----|-------|-----|------|------|-------|----|----|------|
| 2  | 0,2 | 3.600 | 70  | 5,0  | 0,10 | 2.200 | 35 | 4  | 0,04 |
| 3  | 0,2 | 2.900 | 80  | 7,5  | 0,15 | 1.800 | 40 | 6  | 0,06 |
| 4  | 0,2 | 2.300 | 90  | 10,0 | 0,20 | 1.400 | 50 | 8  | 0,08 |
| 5  | 0,5 | 2.000 | 120 | 12,5 | 0,25 | 1.300 | 60 | 10 | 0,10 |
| 6  | 0,2 | 1.700 | 150 | 15,0 | 0,30 | 1.100 | 70 | 12 | 0,12 |
| 8  | 0,2 | 1.300 | 150 | 20,0 | 0,40 | 900   | 70 | 16 | 0,16 |
| 10 | 0,5 | 1.100 | 150 | 25,0 | 0,50 | 700   | 70 | 20 | 0,20 |
| 12 | 0,5 | 900   | 120 | 30,0 | 0,60 | 570   | 60 | 24 | 0,24 |

↓ Valori (a<sub>p</sub>) (a<sub>e</sub>) per cave | Values (a<sub>p</sub>) (a<sub>e</sub>) for Slot Milling

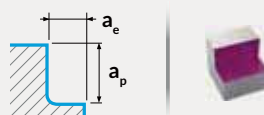


- Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

## 1433HPA

Z2

Frese toriche con scarico in Metallo Duro Integrale micrograna.  
Corner radius end mills long neck in solid carbide micro grain.



|                                     | Acciai Temprati<br>Hardened Steels |                            |                        |                        |                           |                            |                        |                        |  |
|-------------------------------------|------------------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|--|
| Durezza<br>Hardness                 | <45 HRc                            |                            |                        |                        | <55 HRc                   |                            |                        |                        |  |
| d <sub>1</sub> + R + I <sub>3</sub> | n<br>(min <sup>-1</sup> )          | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |  |

|      |      |    |        |       |       |       |       |     |       |       |
|------|------|----|--------|-------|-------|-------|-------|-----|-------|-------|
| 0,8  | 0,02 | 8  | 11.000 | 230   | 0,004 | 0,077 | 9.300 | 160 | 0,003 | 0,077 |
| 1,0  | 0,02 | 10 | 7.500  | 270   | 0,009 | 0,107 | 6.500 | 230 | 0,011 | 0,107 |
| 1,5  | 0,10 | 10 | 7.200  | 640   | 0,027 | 0,245 | 6.600 | 550 | 0,036 | 0,245 |
| 2,0  | 0,05 | 12 | 8.000  | 700   | 0,026 | 0,383 | 7.200 | 630 | 0,037 | 0,383 |
| 3,0  | 0,05 | 12 | 9.000  | 980   | 0,089 | 0,536 | 8.500 | 760 | 0,089 | 0,570 |
| 4,0  | 0,10 | 20 | 5.900  | 850   | 0,046 | 0,765 | 5.000 | 730 | 0,068 | 0,765 |
| 6,0  | 0,10 | 20 | 5.200  | 1.060 | 0,414 | 1,179 | 3.100 | 900 | 0,162 | 1,179 |
| 8,0  | 1,00 | 22 | 4.800  | 940   | 0,364 | 1,320 | 2.800 | 790 | 0,143 | 1,320 |
| 10,0 | 1,00 | 24 | 3.900  | 800   | 0,310 | 1,430 | 2.400 | 670 | 0,121 | 1,430 |
| 12,0 | 1,00 | 26 | 3.300  | 670   | 0,260 | 1,760 | 2.000 | 560 | 0,102 | 1,760 |

- Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

## 14334HPA

Z4

Frese toriche con scarico in Metallo Duro Integrale micrograna.  
Corner radius end mills long neck in solid carbide micro grain.



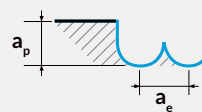
|                                     | Acciai Pretemprati-Temprati<br>Prehardened-Hardened Steels |                            |                        |                        | Acciai Temprati<br>Hardened Steels |                            |                        |                        |  |
|-------------------------------------|------------------------------------------------------------|----------------------------|------------------------|------------------------|------------------------------------|----------------------------|------------------------|------------------------|--|
| Durezza<br>Hardness                 | 30-45 HRC                                                  |                            |                        |                        | 45-55 HRC                          |                            |                        |                        |  |
| d <sub>1</sub> + R + I <sub>3</sub> | n<br>(min <sup>-1</sup> )                                  | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> )          | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |  |
|                                     |                                                            |                            |                        |                        |                                    |                            |                        |                        |  |
| 1,0 0,05 4                          | 11.700                                                     | 1.100                      | 0,033                  | 0,230                  | 10.200                             | 910                        | 0,026                  | 0,207                  |  |
| 1,5 0,10 6                          | 9.900                                                      | 1.100                      | 0,035                  | 0,413                  | 9.000                              | 1.000                      | 0,032                  | 0,378                  |  |
| 2,0 0,10 12                         | 7.800                                                      | 880                        | 0,039                  | 0,344                  | 7.200                              | 820                        | 0,037                  | 0,344                  |  |
| 2,5 0,10 16                         | 6.600                                                      | 1.000                      | 0,041                  | 0,230                  | 6.400                              | 570                        | 0,026                  | 0,191                  |  |
| 3,0 0,10 20                         | 7.100                                                      | 1.300                      | 0,049                  | 0,493                  | 6.700                              | 1.300                      | 0,031                  | 0,493                  |  |
| 4,0 0,10 20                         | 6.200                                                      | 1.200                      | 0,060                  | 0,800                  | 5.200                              | 1.120                      | 0,047                  | 0,800                  |  |
| 6,0 0,10 20                         | 4.900                                                      | 1.470                      | 0,153                  | 2,004                  | 2.900                              | 850                        | 0,153                  | 1,114                  |  |
| 8,0 0,30 25                         | 4.000                                                      | 1.600                      | 0,184                  | 2,540                  | 2.400                              | 680                        | 0,184                  | 1,320                  |  |
| 10,0 0,50 25                        | 3.200                                                      | 1.750                      | 0,210                  | 2,730                  | 1.900                              | 540                        | 0,220                  | 1,430                  |  |
| 12,0 0,50 30                        | 2.500                                                      | 1.800                      | 0,230                  | 2,700                  | 1.500                              | 430                        | 0,240                  | 1,490                  |  |

• Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

## 416RHPA

Z2

Frese sferiche in Metallo Duro Integrale micrograna.  
Ball nose end mills in solid carbide micro grain.



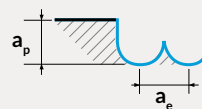
|                     | Acciai Temprati<br>Hardened Steels |                            |                        |                        |                           |                            |                        |                        |  |
|---------------------|------------------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|--|
| Durezza<br>Hardness | ≤ 45 HRc                           |                            |                        |                        | ≤ 55 HRc                  |                            |                        |                        |  |
| R                   | n<br>(min <sup>-1</sup> )          | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |  |
| 0,10                | 54.000                             | 330                        | 0,02                   | 0,050                  | 44.000                    | 345                        | 0,016                  | 0,040                  |  |
| 0,15                | 54.000                             | 715                        | 0,03                   | 0,075                  | 44.300                    | 575                        | 0,025                  | 0,060                  |  |
| 0,20                | 54.000                             | 880                        | 0,04                   | 0,100                  | 44.300                    | 700                        | 0,030                  | 0,085                  |  |
| 0,25                | 53.000                             | 1.250                      | 0,05                   | 0,150                  | 43.500                    | 1.000                      | 0,040                  | 0,120                  |  |
| 0,30                | 48.500                             | 1.020                      | 0,06                   | 0,155                  | 40.500                    | 810                        | 0,048                  | 0,124                  |  |
| 0,40                | 45.000                             | 1.085                      | 0,08                   | 0,200                  | 37.500                    | 870                        | 0,064                  | 0,160                  |  |
| 0,50                | 38.500                             | 1.560                      | 0,10                   | 0,300                  | 36.900                    | 1.250                      | 0,080                  | 0,240                  |  |
| 0,75                | 25.380                             | 1.600                      | 0,15                   | 0,450                  | 28.700                    | 1.280                      | 0,120                  | 0,360                  |  |
| 1,00                | 30.370                             | 1.850                      | 0,20                   | 0,600                  | 24.600                    | 1.480                      | 0,160                  | 0,480                  |  |
| 1,25                | 28.700                             | 1.600                      | 0,25                   | 0,640                  | 27.900                    | 1.280                      | 0,200                  | 0,430                  |  |
| 2,00                | 17.670                             | 2.450                      | 0,40                   | 1,380                  | 17.140                    | 1.960                      | 0,320                  | 1,100                  |  |
| 2,50                | 16.500                             | 2.570                      | 0,50                   | 1,800                  | 16.000                    | 2.060                      | 0,400                  | 1,500                  |  |
| 3,00                | 15.500                             | 2.700                      | 0,60                   | 2,300                  | 15.000                    | 2.160                      | 0,480                  | 1,870                  |  |
| 4,00                | 10.900                             | 2.300                      | 0,80                   | 3,100                  | 10.600                    | 1.840                      | 0,640                  | 2,480                  |  |
| 5,00                | 8.900                              | 2.200                      | 1,00                   | 3,750                  | 8.700                     | 1.780                      | 0,800                  | 3,000                  |  |
| 6,00                | 6.670                              | 1.850                      | 1,20                   | 4,400                  | 6.480                     | 1480                       | 0,960                  | 3,500                  |  |

• Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

## 431RHPA

Z2

Frese sferiche con scarico in Metallo Duro Integrale micrograna.  
Ball nose end mills long neck in solid carbide micro grain.



| Acciai Temprati<br>Hardened Steels |                           |                            |                        |                        |                           |                            |                        |                        |  |
|------------------------------------|---------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|--|
| Durezza<br>Hardness                | ≤ 45 HRC                  |                            |                        |                        | ≤ 55 HRC                  |                            |                        |                        |  |
| R + I <sub>3</sub>                 | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |  |
| 0,10 1,5                           | 42.000                    | 230                        | 0,003                  | 0,0040                 | 42.000                    | 180                        | 0,003                  | 0,004                  |  |
| 0,15 5,0                           | 24.000                    | 180                        | 0,003                  | 0,0030                 | 20.000                    | 140                        | 0,003                  | 0,003                  |  |
| 0,20 5,0                           | 25.000                    | 310                        | 0,008                  | 0,0100                 | 22.000                    | 240                        | 0,006                  | 0,010                  |  |
| 0,25 10,0                          | 24.000                    | 380                        | 0,007                  | 0,0100                 | 24.000                    | 310                        | 0,005                  | 0,010                  |  |
| 0,30 10,0                          | 20.000                    | 300                        | 0,005                  | 0,0200                 | 19.000                    | 260                        | 0,004                  | 0,020                  |  |
| 0,40 10,0                          | 24.000                    | 390                        | 0,020                  | 0,0500                 | 16.000                    | 340                        | 0,015                  | 0,050                  |  |
| 0,50 10,0                          | 13.600                    | 500                        | 0,020                  | 0,0556                 | 12.500                    | 380                        | 0,014                  | 0,056                  |  |
| 0,75 18,0                          | 10.100                    | 420                        | 0,022                  | 0,1100                 | 8.000                     | 360                        | 0,020                  | 0,110                  |  |
| 1,00 20,0                          | 13.300                    | 500                        | 0,060                  | 0,1100                 | 10.600                    | 500                        | 0,055                  | 0,110                  |  |
| 1,50 20,0                          | 10.300                    | 1.230                      | 0,145                  | 0,3200                 | 7.100                     | 940                        | 0,120                  | 0,310                  |  |
| 2,00 30,0                          | 7.400                     | 1.150                      | 0,200                  | 0,3200                 | 5.500                     | 880                        | 0,150                  | 0,300                  |  |
| 2,50 25,0                          | 7.000                     | 1.150                      | 0,300                  | 0,5500                 | 5.000                     | 900                        | 0,220                  | 0,550                  |  |
| 3,00 30,0                          | 6.000                     | 1.400                      | 0,300                  | 0,6500                 | 4.200                     | 990                        | 0,220                  | 0,650                  |  |
| 4,00 30,0                          | 5.800                     | 940                        | 0,300                  | 0,7500                 | 4.000                     | 720                        | 0,160                  | 0,600                  |  |
| 5,00 35,0                          | 4.500                     | 900                        | 0,350                  | 0,8500                 | 3.800                     | 680                        | 0,150                  | 0,600                  |  |
| 6,00 40,0                          | 3.800                     | 800                        | 0,400                  | 0,8500                 | 3.400                     | 650                        | 0,200                  | 0,003                  |  |

• Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters



**Evolution**  
FRESE · END MILLS

**Talicarb**



**FRESE PER ACCIAI TEMPRATI FINO A 68 HRC**  
End Mills for hardened steels up to 68 HRC

**Frese a testa piana in metallo duro integrale micrograna.**  
Square end mills in solid carbide micro grain.

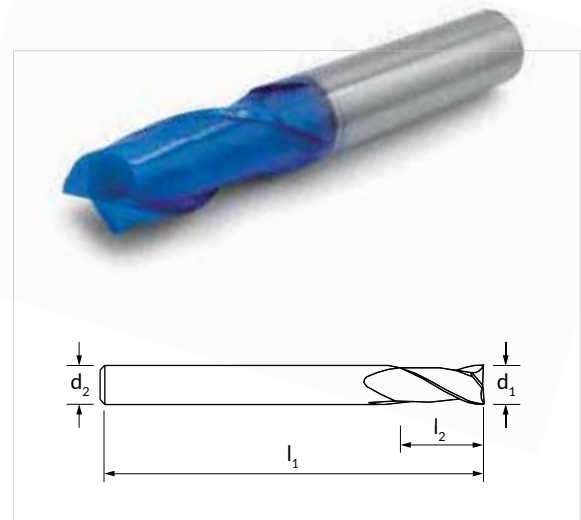
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## Operazioni di fresatura | Milling strategies:

|  |  |   |   |   |   |
|--|--|---|---|---|---|
|  |  | - | - | - | - |
|--|--|---|---|---|---|

## Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |                                |
|---|---|---|---|---|---|--------------------------------|
|   |   |   |   |   |   | ● Raccomandato - Most suitable |
|   |   |   |   |   |   | ○ Possibile - Possible         |



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø      | Raggio   Radius |
|------------------------------|-----------------|
| d≤6: 0/-0.01   d>6: 0/-0.015 | -               |

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |

|     |    |     |   |
|-----|----|-----|---|
| 0.2 | 38 | 0.4 | 4 |
| 0.3 | 38 | 0.6 | 4 |
| 0.4 | 38 | 0.8 | 4 |
| 0.5 | 38 | 1   | 4 |
| 0.6 | 38 | 1.2 | 4 |
| 0.7 | 38 | 1.4 | 4 |
| 0.8 | 38 | 1.6 | 4 |
| 1   | 40 | 2.5 | 4 |
| 1   | 40 | 2.5 | 6 |
| 1.2 | 40 | 3   | 4 |
| 1.5 | 40 | 4   | 4 |
| 1.5 | 40 | 4   | 6 |
| 2   | 40 | 6   | 4 |
| 2   | 40 | 6   | 6 |
| 2.5 | 40 | 8   | 4 |
| 2.5 | 40 | 8   | 6 |
| 3   | 45 | 8   | 4 |
| 3   | 45 | 8   | 6 |

| 1412HP    |                               |                               |
|-----------|-------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
|           |                               | €                             |

|        |                    |
|--------|--------------------|
| 437796 | 1412HP .2X.4X38X4  |
| 437797 | 1412HP .3X.6X38X4  |
| 437798 | 1412HP .4X.8X38X4  |
| 437799 | 1412HP .5X1X38X4   |
| 437800 | 1412HP .6X1.2X38X4 |
| 437801 | 1412HP .7X1.4X38X4 |
| 437802 | 1412HP .8X1.6X38X4 |
| 437451 | 1412HP 1X2.5X40X4  |
| 437452 | 1412HP 1X2.5X40X6  |
| 437803 | 1412HP 1.2X3X40X4  |
| 437453 | 1412HP 1.5X4X40X4  |
| 437454 | 1412HP 1.5X4X40X6  |
| 437455 | 1412HP 2X6X40X4    |
| 437456 | 1412HP 2X6X40X6    |
| 437804 | 1412HP 2.5X8X40X4  |
| 437805 | 1412HP 2.5X8X40X6  |
| 437457 | 1412HP 3X8X45X4    |
| 437458 | 1412HP 3X8X45X6    |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter | 1412HP    |                               |                               |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|-----------|-------------------------------|-------------------------------|
|                                     |                                    |                                      |                                    | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |           |                               | €                             |
| 3.5                                 | 45                                 | 8                                    | 4                                  | 437806    | 1412HP 3.5X8X45X4             |                               |
| 4                                   | 45                                 | 10                                   | 4                                  | 437459    | 1412HP 4X10X45X4              |                               |
| 4                                   | 45                                 | 11                                   | 6                                  | 437460    | 1412HP 4X11X45X6              |                               |
| 4.5                                 | 45                                 | 11                                   | 6                                  | 437807    | 1412HP 4.5X11X45X6            |                               |
| 5                                   | 50                                 | 13                                   | 6                                  | 437461    | 1412HP 5X13X50X6              |                               |
| 5.5                                 | 50                                 | 13                                   | 6                                  | 437808    | 1412HP 5.5X13X50X6            |                               |
| 6                                   | 50                                 | 13                                   | 6                                  | 437462    | 1412HP 6X13X50X6              |                               |
| 6.5                                 | 60                                 | 15                                   | 8                                  | 437809    | 1412HP 6.5X15X60X8            |                               |
| 7                                   | 60                                 | 16                                   | 8                                  | 437810    | 1412HP 7X16X60X8              |                               |
| 7.5                                 | 60                                 | 16                                   | 8                                  | 437811    | 1412HP 7.5X16X60X8            |                               |
| 8                                   | 60                                 | 19                                   | 8                                  | 437463    | 1412HP 8X19X60X8              |                               |
| 8.5                                 | 70                                 | 19                                   | 10                                 | 437812    | 1412HP 8.5X19X70X10           |                               |
| 9                                   | 70                                 | 19                                   | 10                                 | 437813    | 1412HP 9X19X70X10             |                               |
| 9.5                                 | 70                                 | 19                                   | 10                                 | 437814    | 1412HP 9.5X19X70X10           |                               |
| 10                                  | 70                                 | 22                                   | 10                                 | 437464    | 1412HP 10X22X70X10            |                               |
| 10.5                                | 75                                 | 22                                   | 12                                 | 437815    | 1412HP 10.5X22X75X12          |                               |
| 11                                  | 75                                 | 22                                   | 12                                 | 437816    | 1412HP 11X22X75X12            |                               |
| 12                                  | 75                                 | 26                                   | 12                                 | 437465    | 1412HP 12X26X75X12            |                               |

Frese a testa piana in metallo duro integrale micrograna.  
Square end mills in solid carbide micro grain.

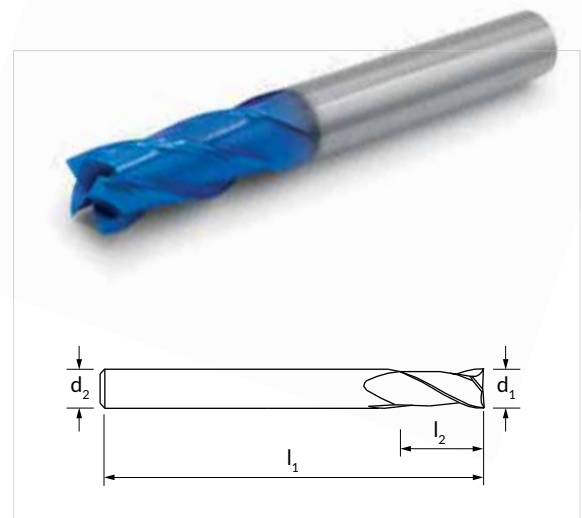
|  |  |   |  |   |
|--|--|---|--|---|
|  |  |   |  | - |
|  |  | - |  |   |

## Operazioni di fresatura | Milling strategies:

|  |  |   |   |   |   |
|--|--|---|---|---|---|
|  |  | - | - | - | - |
|--|--|---|---|---|---|

## Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |                                |
|---|---|---|---|---|---|--------------------------------|
|   |   |   |   |   |   | ● Raccomandato - Most suitable |
|   |   |   |   |   |   | ○ Possibile - Possible         |



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø      | Raggio   Radius |
|------------------------------|-----------------|
| d≤6: 0/-0.01   d>6: 0/-0.015 | -               |

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |
| 1                                   | 40                                 | 2.5                                  | 4                                  |
| 1                                   | 40                                 | 2.5                                  | 6                                  |
| 1.5                                 | 40                                 | 4                                    | 4                                  |
| 1.5                                 | 40                                 | 4                                    | 6                                  |
| 2                                   | 40                                 | 6                                    | 4                                  |
| 2                                   | 40                                 | 6                                    | 6                                  |
| 2.5                                 | 40                                 | 8                                    | 4                                  |
| 2.5                                 | 40                                 | 8                                    | 6                                  |
| 3                                   | 45                                 | 8                                    | 4                                  |
| 3                                   | 45                                 | 8                                    | 6                                  |
| 3.5                                 | 45                                 | 8                                    | 4                                  |
| 4                                   | 45                                 | 11                                   | 4                                  |
| 4                                   | 45                                 | 11                                   | 6                                  |
| 4.5                                 | 45                                 | 11                                   | 6                                  |
| 5                                   | 50                                 | 13                                   | 6                                  |
| 6                                   | 50                                 | 15                                   | 6                                  |
| 8                                   | 60                                 | 19                                   | 8                                  |
| 10                                  | 70                                 | 22                                   | 10                                 |

| 1414HP    |                               |                               |
|-----------|-------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
|           |                               | €                             |
| 437726    | 1414HP 1X2.5X40X4             |                               |
| 437727    | 1414HP 1X2.5X40X6             |                               |
| 437728    | 1414HP 1.5X4X40X4             |                               |
| 437729    | 1414HP 1.5X4X40X6             |                               |
| 437730    | 1414HP 2X6X40X4               |                               |
| 437731    | 1414HP 2X6X40X6               |                               |
| 438587    | 1414HP 2.5X8X40X4             |                               |
| 438588    | 1414HP 2.5X8X40X6             |                               |
| 437732    | 1414HP 3X8X45X4               |                               |
| 437733    | 1414HP 3X8X45X6               |                               |
| 438589    | 1414HP 3.5X8X45X4             |                               |
| 437734    | 1414HP 4X11X45X4              |                               |
| 437735    | 1414HP 4X11X45X6              |                               |
| 438590    | 1414HP 4.5X11X45X6            |                               |
| 437736    | 1414HP 5X13X50X6              |                               |
| 437737    | 1414HP 6X15X50X6              |                               |
| 437738    | 1414HP 8X19X60X8              |                               |
| 437739    | 1414HP 10X22X70X10            |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter | 1414HP    |                               |                                                                                     |                               |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|-----------|-------------------------------|-------------------------------------------------------------------------------------|-------------------------------|
|                                     |                                    |                                      |                                    | ART. NUM. | Codice d'ordine<br>Order code |  | Prezzo utensile<br>Tool Price |
| $d_1$                               | $l_1$                              | $l_2$                                | $d_2$                              |           |                               |                                                                                     |                               |
| 12                                  | 75                                 | 26                                   | 12                                 | 437740    | 1414HP                        | 12X26X75X12                                                                         | €                             |

Frese a testa piana in metallo duro integrale micrograna per lavorazioni di sgrossatura pesante.  
Square end mills in solid carbide micro grain for heavy roughing machining.

|    |            |                      |                      |      |
|----|------------|----------------------|----------------------|------|
| HP | Z4         | $\lambda_{45^\circ}$ | $\gamma_{2.8^\circ}$ | -    |
| h6 | SHRINK FIT | -                    | P159                 | P170 |

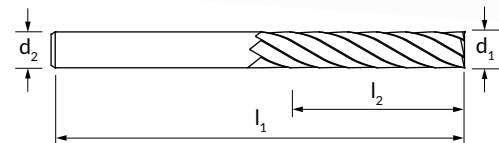
## Operazioni di fresatura | Milling strategies:

|  |  |   |   |   |   |
|--|--|---|---|---|---|
|  |  | - | - | - | - |
|--|--|---|---|---|---|

## Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |                                                          |
|---|---|---|---|---|---|----------------------------------------------------------|
| ○ | - | ○ | - | - | ● | ● Raccomandato - Most suitable<br>○ Possibile - Possible |

NEW



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø          | Raggio   Radius |
|----------------------------------|-----------------|
| d ≤ 6: 0/-0.01   d > 6: 0/-0.015 | -               |

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |

|     |    |     |   |
|-----|----|-----|---|
| 1   | 40 | 2.5 | 6 |
| 1   | 40 | 5   | 6 |
| 1.5 | 40 | 4   | 6 |
| 1.5 | 40 | 6   | 6 |
| 2   | 40 | 5   | 6 |
| 2   | 40 | 8   | 6 |
| 2   | 50 | 10  | 6 |
| 2.5 | 45 | 8   | 6 |
| 2.5 | 50 | 10  | 6 |
| 3   | 45 | 8   | 6 |
| 3   | 50 | 12  | 3 |
| 3   | 50 | 12  | 6 |
| 3   | 55 | 15  | 6 |
| 4   | 45 | 10  | 6 |
| 4   | 55 | 15  | 6 |
| 4   | 60 | 20  | 4 |
| 4   | 60 | 20  | 6 |
| 5   | 55 | 15  | 6 |

| 14145HP   |                               |         |                               |
|-----------|-------------------------------|---------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code |         | Prezzo utensile<br>Tool Price |
|           |                               | HA 6535 | €                             |

|        |         |             |
|--------|---------|-------------|
| 448634 | 14145HP | 1X2.5X40X6  |
| 448635 | 14145HP | 1X5X40X6    |
| 448636 | 14145HP | 1.5X4X40X6  |
| 448637 | 14145HP | 1.5X6X40X6  |
| 448638 | 14145HP | 2X5X40X6    |
| 448639 | 14145HP | 2X8X40X6    |
| 448640 | 14145HP | 2X10X50X6   |
| 448641 | 14145HP | 2.5X8X45X6  |
| 448642 | 14145HP | 2.5X10X50X6 |
| 448643 | 14145HP | 3X8X45X6    |
| 448644 | 14145HP | 3X12X50X3   |
| 448645 | 14145HP | 3X12X50X6   |
| 448646 | 14145HP | 3X15X55X6   |
| 448647 | 14145HP | 4X10X45X6   |
| 448648 | 14145HP | 4X15X55X6   |
| 448649 | 14145HP | 4X20X60X4   |
| 448650 | 14145HP | 4X20X60X6   |
| 448651 | 14145HP | 5X15X55X6   |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter | 14145HP   |                               |                               |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|-----------|-------------------------------|-------------------------------|
|                                     |                                    |                                      |                                    | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |           |                               | €                             |
| 5                                   | 60                                 | 25                                   | 6                                  | 448652    | 14145HP 5X25X60X6             |                               |
| 6                                   | 55                                 | 15                                   | 6                                  | 448653    | 14145HP 6X15X55X6             |                               |
| 6                                   | 100                                | 15                                   | 6                                  | 448654    | 14145HP 6X15X100X6            |                               |
| 6                                   | 60                                 | 20                                   | 6                                  | 448655    | 14145HP 6X20X60X6             |                               |
| 6                                   | 65                                 | 25                                   | 6                                  | 448656    | 14145HP 6X25X65X6             |                               |
| 6                                   | 70                                 | 30                                   | 6                                  | 448657    | 14145HP 6X30X70X6             |                               |
| 8                                   | 60                                 | 20                                   | 8                                  | 448658    | 14145HP 8X20X60X8             |                               |
| 8                                   | 100                                | 20                                   | 8                                  | 448659    | 14145HP 8X20X100X8            |                               |
| 8                                   | 65                                 | 25                                   | 8                                  | 448660    | 14145HP 8X25X65X8             |                               |
| 8                                   | 70                                 | 30                                   | 8                                  | 448661    | 14145HP 8X30X70X8             |                               |
| 8                                   | 80                                 | 40                                   | 8                                  | 448662    | 14145HP 8X40X80X8             |                               |
| 10                                  | 60                                 | 20                                   | 10                                 | 448663    | 14145HP 10X20X60X10           |                               |
| 10                                  | 100                                | 22                                   | 10                                 | 448664    | 14145HP 10X22X100X10          |                               |
| 10                                  | 70                                 | 30                                   | 10                                 | 448665    | 14145HP 10X30X70X10           |                               |
| 10                                  | 80                                 | 40                                   | 10                                 | 448666    | 14145HP 10X40X80X10           |                               |
| 10                                  | 100                                | 50                                   | 10                                 | 448667    | 14145HP 10X50X100X10          |                               |
| 12                                  | 75                                 | 30                                   | 12                                 | 448668    | 14145HP 12X30X75X12           |                               |
| 12                                  | 80                                 | 40                                   | 12                                 | 448669    | 14145HP 12X40X80X12           |                               |
| 12                                  | 100                                | 50                                   | 12                                 | 448670    | 14145HP 12X50X100X12          |                               |
| 14                                  | 80                                 | 35                                   | 14                                 | 448671    | 14145HP 14X35X80X14           |                               |
| 16                                  | 80                                 | 35                                   | 16                                 | 448672    | 14145HP 16X35X80X16           |                               |
| 16                                  | 100                                | 50                                   | 16                                 | 448673    | 14145HP 16X50X100X16          |                               |
| 16                                  | 120                                | 70                                   | 16                                 | 448674    | 14145HP 16X70X120X16          |                               |
| 20                                  | 110                                | 50                                   | 20                                 | 448675    | 14145HP 20X50X110X20          |                               |
| 20                                  | 130                                | 70                                   | 20                                 | 448676    | 14145HP 20X70X130X20          |                               |

Frese a testa piana in metallo duro integrale micrograna.  
Square end mills in solid carbide micro grain.

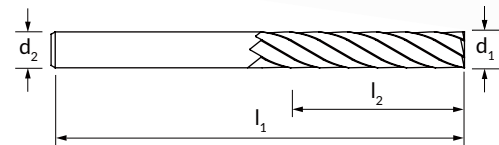
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#### Operazioni di fresatura | Milling strategies:

|  |  |   |   |   |   |
|--|--|---|---|---|---|
|  |  | - | - | - | - |
|--|--|---|---|---|---|

#### Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |                                |
|---|---|---|---|---|---|--------------------------------|
|   |   |   |   |   |   | ● Raccomandato - Most suitable |
|   |   |   |   |   |   | ○ Possibile - Possible         |



#### Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø          | Raggio   Radius |
|----------------------------------|-----------------|
| d ≤ 6: 0/-0.01   d > 6: 0/-0.015 | -               |

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |
| 6                                   | 50                                 | 15                                   | 6                                  |
| 6                                   | 60                                 | 20                                   | 6                                  |
| 6                                   | 65                                 | 25                                   | 6                                  |
| 6                                   | 70                                 | 30                                   | 6                                  |
| 8                                   | 65                                 | 25                                   | 8                                  |
| 8                                   | 70                                 | 30                                   | 8                                  |
| 8                                   | 90                                 | 35                                   | 8                                  |
| 8                                   | 90                                 | 40                                   | 8                                  |
| 10                                  | 80                                 | 35                                   | 10                                 |
| 10                                  | 100                                | 45                                   | 10                                 |
| 10                                  | 110                                | 55                                   | 10                                 |
| 12                                  | 90                                 | 40                                   | 12                                 |
| 12                                  | 100                                | 50                                   | 12                                 |
| 12                                  | 110                                | 60                                   | 12                                 |
| 16                                  | 100                                | 45                                   | 16                                 |
| 16                                  | 110                                | 50                                   | 16                                 |
| 16                                  | 150                                | 80                                   | 16                                 |
| 20                                  | 110                                | 50                                   | 20                                 |

| 1416HP    |                               |                               |
|-----------|-------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
|           |                               | €                             |
| 438591    | 1416HP 6X15X50X6              |                               |
| 438592    | 1416HP 6X20X60X6              |                               |
| 438593    | 1416HP 6X25X65X6              |                               |
| 438594    | 1416HP 6X30X70X6              |                               |
| 438595    | 1416HP 8X25X65X8              |                               |
| 438596    | 1416HP 8X30X70X8              |                               |
| 438597    | 1416HP 8X35X90X8              |                               |
| 438598    | 1416HP 8X40X90X8              |                               |
| 437741    | 1416HP 10X35X80X10            |                               |
| 438599    | 1416HP 10X45X100X10           |                               |
| 437742    | 1416HP 10X55X110X10           |                               |
| 438600    | 1416HP 12X40X90X12            |                               |
| 437743    | 1416HP 12X50X100X12           |                               |
| 438601    | 1416HP 12X60X110X12           |                               |
| 437744    | 1416HP 16X45X100X16           |                               |
| 438602    | 1416HP 16X50X110X16           |                               |
| 437745    | 1416HP 16X80X150X16           |                               |
| 438603    | 1416HP 20X50X110X20           |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter | 1416HP    |                               |                                                                                     |                               |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|-----------|-------------------------------|-------------------------------------------------------------------------------------|-------------------------------|
|                                     |                                    |                                      |                                    | ART. NUM. | Codice d'ordine<br>Order code |  | Prezzo utensile<br>Tool Price |
| $d_1$                               | $l_1$                              | $l_2$                                | $d_2$                              |           |                               |                                                                                     | €                             |
| 20                                  | 150                                | 80                                   | 20                                 | 437746    | 1416HP                        | 20X80X150X20                                                                        |                               |
| 20                                  | 160                                | 100                                  | 20                                 | 438604    | 1416HP                        | 20X100X160X20                                                                       |                               |

Frese a testa piana con scarico in metallo duro integrale micrograna.  
Square end mills long neck in solid carbide micro grain.

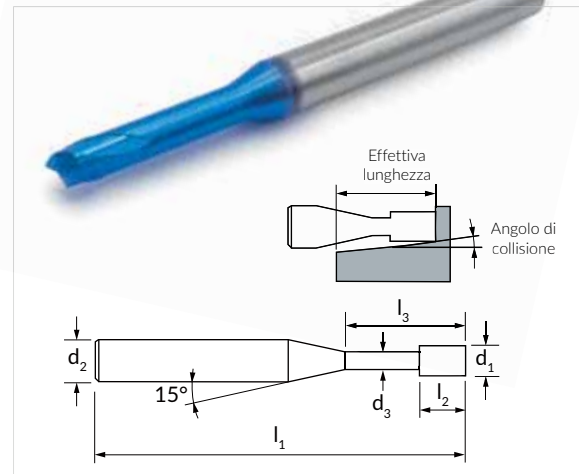
|  |  |   |  |   |
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|  |  | - |  |   |

#### Operazioni di fresatura | Milling strategies:

|  |  |   |   |   |   |
|--|--|---|---|---|---|
|  |  | - | - | - | - |
|--|--|---|---|---|---|

#### Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |                                |
|---|---|---|---|---|---|--------------------------------|
|   |   |   |   |   |   | ● Raccomandato - Most suitable |
|   |   |   |   |   |   | ○ Possibile - Possible         |



#### Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø                   | Raggio   Radius |
|-------------------------------------------|-----------------|
| $d \leq 6$ : 0/-0.01   $d > 6$ : 0/-0.015 | -               |

| 1430HP                              |                                    |                                      |                                    |                                    |                                 |                                                                                                                                          |      |       |      |      | 1430HP    |                               |                               |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|------|-------|------|------|-----------|-------------------------------|-------------------------------|
| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza sotto collo, per diversi gradi di angolo di sforno.<br>The effective under-neck length for the various draft angles. |      |       |      |      | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| $d_1$                               | $l_1$                              | $l_2$                                | $l_3$                              | $d_2$                              | $d_3$                           | 30°                                                                                                                                      | 1°   | 1°30' | 2°   | 3°   |           |                               | €                             |
| 0.1                                 | 45                                 | 0.10                                 | 0.30                               | 4                                  | 0.085                           | 0.33                                                                                                                                     | 0.35 | 0.36  | 0.37 | 0.40 | 437823    | 1430HP .1X.3X45X4             |                               |
| 0.1                                 | 45                                 | 0.10                                 | 0.50                               | 4                                  | 0.085                           | 0.54                                                                                                                                     | 0.56 | 0.58  | 0.60 | 0.65 | 437824    | 1430HP .1X.5X45X4             |                               |
| 0.1                                 | 45                                 | 0.10                                 | 1.00                               | 4                                  | 0.085                           | 1.06                                                                                                                                     | 1.09 | 1.13  | 1.18 | 1.27 | 437825    | 1430HP .1X1X45X4              |                               |
| 0.15                                | 45                                 | 0.15                                 | 0.30                               | 4                                  | 0.13                            | 0.34                                                                                                                                     | 0.36 | 0.37  | 0.38 | 0.41 | 437826    | 1430HP .15X.3X45X4            |                               |
| 0.15                                | 45                                 | 0.15                                 | 0.50                               | 4                                  | 0.13                            | 0.55                                                                                                                                     | 0.57 | 0.59  | 0.61 | 0.66 | 437827    | 1430HP .15X.5X45X4            |                               |
| 0.15                                | 45                                 | 0.15                                 | 1.00                               | 4                                  | 0.13                            | 1.07                                                                                                                                     | 1.10 | 1.14  | 1.19 | 1.28 | 437828    | 1430HP .15X1X45X4             |                               |
| 0.2                                 | 45                                 | 0.20                                 | 0.50                               | 4                                  | 0.18                            | 0.55                                                                                                                                     | 0.57 | 0.59  | 0.61 | 0.66 | 437829    | 1430HP .2X.5X45X4             |                               |
| 0.2                                 | 45                                 | 0.20                                 | 1.00                               | 4                                  | 0.18                            | 1.07                                                                                                                                     | 1.10 | 1.14  | 1.19 | 1.28 | 437830    | 1430HP .2X1X45X4              |                               |
| 0.2                                 | 45                                 | 0.20                                 | 1.50                               | 4                                  | 0.18                            | 1.58                                                                                                                                     | 1.64 | 1.70  | 1.76 | 1.91 | 437831    | 1430HP .2X1.5X45X4            |                               |
| 0.2                                 | 45                                 | 0.20                                 | 2.00                               | 4                                  | 0.18                            | 2.10                                                                                                                                     | 2.17 | 2.25  | 2.34 | 2.53 | 437466    | 1430HP .2X2X45X4              |                               |
| 0.2                                 | 45                                 | 0.20                                 | 3.00                               | 4                                  | 0.18                            | 3.13                                                                                                                                     | 3.24 | 3.36  | 3.49 | 3.77 | 437832    | 1430HP .2X3X45X4              |                               |
| 0.2                                 | 45                                 | 0.20                                 | 4.00                               | 4                                  | 0.18                            | 4.17                                                                                                                                     | 4.31 | 4.47  | 4.64 | 5.01 | 437833    | 1430HP .2X4X45X4              |                               |
| 0.3                                 | 45                                 | 0.30                                 | 1.00                               | 4                                  | 0.28                            | 1.07                                                                                                                                     | 1.10 | 1.14  | 1.19 | 1.28 | 437834    | 1430HP .3X1X45X4              |                               |
| 0.3                                 | 45                                 | 0.30                                 | 1.50                               | 4                                  | 0.28                            | 1.58                                                                                                                                     | 1.64 | 1.70  | 1.76 | 1.91 | 437835    | 1430HP .3X1.5X45X4            |                               |
| 0.3                                 | 45                                 | 0.30                                 | 2.00                               | 4                                  | 0.28                            | 2.10                                                                                                                                     | 2.17 | 2.25  | 2.34 | 2.53 | 437836    | 1430HP .3X2X45X4              |                               |
| 0.3                                 | 45                                 | 0.30                                 | 3.00                               | 4                                  | 0.28                            | 3.13                                                                                                                                     | 3.24 | 3.36  | 3.49 | 3.77 | 437467    | 1430HP .3X3X45X4              |                               |
| 0.3                                 | 45                                 | 0.30                                 | 4.00                               | 4                                  | 0.28                            | 4.17                                                                                                                                     | 4.31 | 4.47  | 4.64 | 5.01 | 437837    | 1430HP .3X4X45X4              |                               |
| 0.3                                 | 45                                 | 0.30                                 | 6.00                               | 4                                  | 0.28                            | 6.24                                                                                                                                     | 6.45 | 6.69  | 6.94 | 7.50 | 437838    | 1430HP .3X6X45X4              |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

|                                     |                                    |                                      |                                    |                                    |                                 |                                                                                                                                                            |       |       |       |       | 1430HP    |                               |                               |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-----------|-------------------------------|-------------------------------|
| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |       |       |       | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30'                                                                                                                                                        | 1°    | 1°30' | 2°    | 3°    |           |                               | €                             |
| 0.3                                 | 45                                 | 0.30                                 | 8.00                               | 4                                  | 0.28                            | 8.30                                                                                                                                                       | 8.59  | 8.90  | 9.24  | 9.99  | 437839    | 1430HP .3X8X45X4              |                               |
| 0.4                                 | 45                                 | 0.40                                 | 1.00                               | 4                                  | 0.37                            | 1.09                                                                                                                                                       | 1.12  | 1.17  | 1.21  | 1.31  | 437840    | 1430HP .4X1X45X4              |                               |
| 0.4                                 | 45                                 | 0.40                                 | 1.50                               | 4                                  | 0.37                            | 1.60                                                                                                                                                       | 1.66  | 1.72  | 1.78  | 1.93  | 437841    | 1430HP .4X1.5X45X4            |                               |
| 0.4                                 | 45                                 | 0.40                                 | 2.00                               | 4                                  | 0.37                            | 2.12                                                                                                                                                       | 2.19  | 2.27  | 2.36  | 2.55  | 437842    | 1430HP .4X2X45X4              |                               |
| 0.4                                 | 45                                 | 0.40                                 | 2.50                               | 4                                  | 0.37                            | 2.64                                                                                                                                                       | 2.73  | 2.83  | 2.93  | 3.17  | 437843    | 1430HP .4X2.5X45X4            |                               |
| 0.4                                 | 45                                 | 0.40                                 | 3.00                               | 4                                  | 0.37                            | 3.15                                                                                                                                                       | 3.26  | 3.38  | 3.51  | 3.79  | 437844    | 1430HP .4X3X45X4              |                               |
| 0.4                                 | 45                                 | 0.40                                 | 3.50                               | 4                                  | 0.37                            | 3.67                                                                                                                                                       | 3.80  | 3.94  | 4.08  | 4.42  | 437845    | 1430HP .4X3.5X45X4            |                               |
| 0.4                                 | 45                                 | 0.40                                 | 4.00                               | 4                                  | 0.37                            | 4.19                                                                                                                                                       | 4.33  | 4.49  | 4.66  | 5.04  | 437468    | 1430HP .4X4X45X4              |                               |
| 0.4                                 | 45                                 | 0.40                                 | 5.00                               | 4                                  | 0.37                            | 5.22                                                                                                                                                       | 5.40  | 5.60  | 5.81  | 6.28  | 437846    | 1430HP .4X5X45X4              |                               |
| 0.4                                 | 45                                 | 0.40                                 | 6.00                               | 4                                  | 0.37                            | 6.25                                                                                                                                                       | 6.47  | 6.71  | 6.96  | 7.52  | 437847    | 1430HP .4X6X45X4              |                               |
| 0.4                                 | 45                                 | 0.40                                 | 8.00                               | 4                                  | 0.37                            | 8.32                                                                                                                                                       | 8.61  | 8.92  | 9.26  | 10.01 | 437848    | 1430HP .4X8X45X4              |                               |
| 0.4                                 | 45                                 | 0.40                                 | 10.00                              | 4                                  | 0.37                            | 10.39                                                                                                                                                      | 10.75 | 11.14 | 11.56 | 12.50 | 437849    | 1430HP .4X10X45X4             |                               |
| 0.4                                 | 45                                 | 0.40                                 | 12.00                              | 4                                  | 0.37                            | 12.46                                                                                                                                                      | 12.89 | 13.36 | 13.86 | 14.98 | 437850    | 1430HP .4X12X45X4             |                               |
| 0.5                                 | 45                                 | 0.50                                 | 1.00                               | 4                                  | 0.47                            | 1.09                                                                                                                                                       | 1.12  | 1.17  | 1.21  | 1.31  | 437851    | 1430HP .5X1X45X4              |                               |
| 0.5                                 | 45                                 | 0.50                                 | 1.50                               | 4                                  | 0.47                            | 1.60                                                                                                                                                       | 1.66  | 1.72  | 1.78  | 1.93  | 437852    | 1430HP .5X1.5X45X4            |                               |
| 0.5                                 | 45                                 | 0.50                                 | 2.00                               | 4                                  | 0.47                            | 2.12                                                                                                                                                       | 2.19  | 2.27  | 2.36  | 2.55  | 437853    | 1430HP .5X2X45X4              |                               |
| 0.5                                 | 45                                 | 0.50                                 | 2.50                               | 4                                  | 0.47                            | 2.64                                                                                                                                                       | 2.73  | 2.83  | 2.93  | 3.17  | 437854    | 1430HP .5X2.5X45X4            |                               |
| 0.5                                 | 45                                 | 0.50                                 | 3.00                               | 4                                  | 0.47                            | 3.15                                                                                                                                                       | 3.26  | 3.38  | 3.51  | 3.79  | 437855    | 1430HP .5X3X45X4              |                               |
| 0.5                                 | 45                                 | 0.50                                 | 3.50                               | 4                                  | 0.47                            | 3.67                                                                                                                                                       | 3.80  | 3.94  | 4.08  | 4.42  | 437856    | 1430HP .5X3.5X45X4            |                               |
| 0.5                                 | 45                                 | 0.50                                 | 4.00                               | 4                                  | 0.47                            | 4.19                                                                                                                                                       | 4.33  | 4.49  | 4.66  | 5.04  | 437469    | 1430HP .5X4X45X4              |                               |
| 0.5                                 | 45                                 | 0.50                                 | 5.00                               | 4                                  | 0.47                            | 5.22                                                                                                                                                       | 5.40  | 5.60  | 5.81  | 6.28  | 437857    | 1430HP .5X5X45X4              |                               |
| 0.5                                 | 45                                 | 0.50                                 | 6.00                               | 4                                  | 0.47                            | 6.25                                                                                                                                                       | 6.47  | 6.71  | 6.96  | 7.52  | 437858    | 1430HP .5X6X45X4              |                               |
| 0.5                                 | 45                                 | 0.50                                 | 8.00                               | 4                                  | 0.47                            | 8.32                                                                                                                                                       | 8.61  | 8.92  | 9.26  | 10.01 | 437859    | 1430HP .5X8X45X4              |                               |
| 0.5                                 | 45                                 | 0.50                                 | 10.00                              | 4                                  | 0.47                            | 10.39                                                                                                                                                      | 10.75 | 11.14 | 11.56 | 12.50 | 437860    | 1430HP .5X10X45X4             |                               |
| 0.5                                 | 45                                 | 0.50                                 | 12.00                              | 4                                  | 0.47                            | 12.46                                                                                                                                                      | 12.89 | 13.36 | 13.86 | 14.98 | 437861    | 1430HP .5X12X45X4             |                               |
| 0.6                                 | 45                                 | 0.60                                 | 1.50                               | 4                                  | 0.57                            | 1.60                                                                                                                                                       | 1.66  | 1.72  | 1.78  | 1.93  | 437862    | 1430HP .6X1.5X45X4            |                               |
| 0.6                                 | 45                                 | 0.60                                 | 2.00                               | 4                                  | 0.57                            | 2.12                                                                                                                                                       | 2.19  | 2.27  | 2.36  | 2.55  | 437863    | 1430HP .6X2X45X4              |                               |
| 0.6                                 | 45                                 | 0.60                                 | 3.00                               | 4                                  | 0.57                            | 3.15                                                                                                                                                       | 3.26  | 3.38  | 3.51  | 3.79  | 437864    | 1430HP .6X3X45X4              |                               |
| 0.6                                 | 45                                 | 0.60                                 | 4.00                               | 4                                  | 0.57                            | 4.19                                                                                                                                                       | 4.33  | 4.49  | 4.66  | 5.04  | 437865    | 1430HP .6X4X45X4              |                               |
| 0.6                                 | 45                                 | 0.60                                 | 5.00                               | 4                                  | 0.57                            | 5.22                                                                                                                                                       | 5.40  | 5.60  | 5.81  | 6.28  | 437470    | 1430HP .6X5X45X4              |                               |
| 0.6                                 | 45                                 | 0.60                                 | 6.00                               | 4                                  | 0.57                            | 6.25                                                                                                                                                       | 6.47  | 6.71  | 6.96  | 7.52  | 437866    | 1430HP .6X6X45X4              |                               |
| 0.6                                 | 45                                 | 0.60                                 | 8.00                               | 4                                  | 0.57                            | 8.32                                                                                                                                                       | 8.61  | 8.92  | 9.26  | 10.01 | 437867    | 1430HP .6X8X45X4              |                               |
| 0.6                                 | 45                                 | 0.60                                 | 10.00                              | 4                                  | 0.57                            | 10.39                                                                                                                                                      | 10.75 | 11.14 | 11.56 | 12.50 | 437868    | 1430HP .6X10X45X4             |                               |
| 0.6                                 | 45                                 | 0.60                                 | 12.00                              | 4                                  | 0.57                            | 12.46                                                                                                                                                      | 12.89 | 13.36 | 13.86 | 14.98 | 437869    | 1430HP .6X12X45X4             |                               |
| 0.6                                 | 50                                 | 0.60                                 | 16.00                              | 4                                  | 0.57                            | 16.59                                                                                                                                                      | 17.17 | 17.79 | 18.46 | 19.95 | 437870    | 1430HP .6X16X50X4             |                               |
| 0.7                                 | 45                                 | 0.70                                 | 2.00                               | 4                                  | 0.66                            | 2.14                                                                                                                                                       | 2.21  | 2.29  | 2.38  | 2.57  | 437871    | 1430HP .7X2X45X4              |                               |
| 0.7                                 | 45                                 | 0.70                                 | 3.00                               | 4                                  | 0.66                            | 3.17                                                                                                                                                       | 3.28  | 3.40  | 3.53  | 3.82  | 437872    | 1430HP .7X3X45X4              |                               |
| 0.7                                 | 45                                 | 0.70                                 | 4.00                               | 4                                  | 0.66                            | 4.21                                                                                                                                                       | 4.35  | 4.51  | 4.68  | 5.06  | 437873    | 1430HP .7X4X45X4              |                               |
| 0.7                                 | 45                                 | 0.70                                 | 6.00                               | 4                                  | 0.66                            | 6.27                                                                                                                                                       | 6.49  | 6.73  | 6.98  | 7.55  | 437874    | 1430HP .7X6X45X4              |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page &gt;&gt;

Frese a testa piana con scarico in metallo duro integrale micrograna.  
Square end mills long neck in solid carbide micro grain.

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |       |       |        | 1430HP    |                               |                               |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|--------|-----------|-------------------------------|-------------------------------|
|                                     |                                    |                                      |                                    |                                    |                                 | 30'                                                                                                                                                        | 1°    | 1°30' | 2°    | 3°     | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  |                                                                                                                                                            |       |       |       |        |           |                               | €                             |
| 0.7                                 | 45                                 | 0.70                                 | 8.00                               | 4                                  | 0.66                            | 8.34                                                                                                                                                       | 8.63  | 8.94  | 9.28  | 10.03  | 437875    | 1430HP .7X8X45X4              |                               |
| 0.7                                 | 45                                 | 0.70                                 | 10.00                              | 4                                  | 0.66                            | 10.41                                                                                                                                                      | 10.77 | 11.16 | 11.58 | 12.52  | 437876    | 1430HP .7X10X45X4             |                               |
| 0.8                                 | 45                                 | 0.80                                 | 2.00                               | 4                                  | 0.77                            | 2.12                                                                                                                                                       | 2.19  | 2.27  | 2.36  | 2.55   | 437877    | 1430HP .8X2X45X4              |                               |
| 0.8                                 | 45                                 | 0.80                                 | 3.00                               | 4                                  | 0.77                            | 3.15                                                                                                                                                       | 3.26  | 3.38  | 3.51  | 3.79   | 437878    | 1430HP .8X3X45X4              |                               |
| 0.8                                 | 45                                 | 0.80                                 | 4.00                               | 4                                  | 0.77                            | 4.19                                                                                                                                                       | 4.33  | 4.49  | 4.66  | 5.04   | 437879    | 1430HP .8X4X45X4              |                               |
| 0.8                                 | 45                                 | 0.80                                 | 5.00                               | 4                                  | 0.77                            | 5.22                                                                                                                                                       | 5.40  | 5.60  | 5.81  | 6.28   | 437471    | 1430HP .8X5X45X4              |                               |
| 0.8                                 | 45                                 | 0.80                                 | 6.00                               | 4                                  | 0.77                            | 6.25                                                                                                                                                       | 6.47  | 6.71  | 6.96  | 7.52   | 437880    | 1430HP .8X6X45X4              |                               |
| 0.8                                 | 45                                 | 0.80                                 | 8.00                               | 4                                  | 0.77                            | 8.32                                                                                                                                                       | 8.61  | 8.92  | 9.26  | 10.01  | 437881    | 1430HP .8X8X45X4              |                               |
| 0.8                                 | 45                                 | 0.80                                 | 10.00                              | 4                                  | 0.77                            | 10.39                                                                                                                                                      | 10.75 | 11.14 | 11.56 | 12.50  | 437882    | 1430HP .8X10X45X4             |                               |
| 0.8                                 | 45                                 | 0.80                                 | 12.00                              | 4                                  | 0.77                            | 12.46                                                                                                                                                      | 12.89 | 13.36 | 13.86 | 14.98  | 437883    | 1430HP .8X12X45X4             |                               |
| 0.8                                 | 50                                 | 0.80                                 | 16.00                              | 4                                  | 0.77                            | 16.59                                                                                                                                                      | 17.17 | 17.79 | 18.46 | 19.95  | 437884    | 1430HP .8X16X50X4             |                               |
| 0.8                                 | 50                                 | 0.80                                 | 20.00                              | 4                                  | 0.77                            | 20.73                                                                                                                                                      | 21.45 | 22.22 | 23.06 | 24.93  | 437885    | 1430HP .8X20X50X4             |                               |
| 0.8                                 | 60                                 | 0.80                                 | 25.00                              | 4                                  | 0.77                            | 25.89                                                                                                                                                      | 26.80 | 27.76 | 28.81 | libero | 437886    | 1430HP .8X25X60X4             |                               |
| 0.9                                 | 45                                 | 0.90                                 | 2.00                               | 4                                  | 0.85                            | 2.16                                                                                                                                                       | 2.23  | 2.32  | 2.40  | 2.60   | 437887    | 1430HP .9X2X45X4              |                               |
| 0.9                                 | 45                                 | 0.90                                 | 4.00                               | 4                                  | 0.85                            | 4.23                                                                                                                                                       | 4.37  | 4.53  | 4.70  | 5.08   | 437888    | 1430HP .9X4X45X4              |                               |
| 0.9                                 | 45                                 | 0.90                                 | 6.00                               | 4                                  | 0.85                            | 6.29                                                                                                                                                       | 6.51  | 6.75  | 7.00  | 7.57   | 437889    | 1430HP .9X6X45X4              |                               |
| 0.9                                 | 45                                 | 0.90                                 | 8.00                               | 4                                  | 0.85                            | 8.36                                                                                                                                                       | 8.65  | 8.96  | 9.30  | 10.06  | 437890    | 1430HP .9X8X45X4              |                               |
| 0.9                                 | 45                                 | 0.90                                 | 10.00                              | 4                                  | 0.85                            | 10.43                                                                                                                                                      | 10.79 | 11.18 | 11.60 | 12.54  | 437891    | 1430HP .9X10X45X4             |                               |
| 1                                   | 45                                 | 1.00                                 | 2.00                               | 4                                  | 0.95                            | 2.16                                                                                                                                                       | 2.23  | 2.32  | 2.40  | 2.60   | 437892    | 1430HP 1X2X45X4               |                               |
| 1                                   | 45                                 | 1.00                                 | 3.00                               | 4                                  | 0.95                            | 3.19                                                                                                                                                       | 3.30  | 3.42  | 3.55  | 3.84   | 437893    | 1430HP 1X3X45X4               |                               |
| 1                                   | 45                                 | 1.00                                 | 4.00                               | 4                                  | 0.95                            | 4.23                                                                                                                                                       | 4.37  | 4.53  | 4.70  | 5.08   | 437472    | 1430HP 1X4X45X4               |                               |
| 1                                   | 45                                 | 1.00                                 | 5.00                               | 4                                  | 0.95                            | 5.26                                                                                                                                                       | 5.44  | 5.64  | 5.85  | 6.33   | 437894    | 1430HP 1X5X45X4               |                               |
| 1                                   | 45                                 | 1.00                                 | 6.00                               | 4                                  | 0.95                            | 6.29                                                                                                                                                       | 6.51  | 6.75  | 7.00  | 7.57   | 437473    | 1430HP 1X6X45X4               |                               |
| 1                                   | 45                                 | 1.00                                 | 8.00                               | 4                                  | 0.95                            | 8.36                                                                                                                                                       | 8.65  | 8.96  | 9.30  | 10.06  | 437474    | 1430HP 1X8X45X4               |                               |
| 1                                   | 45                                 | 1.00                                 | 10.00                              | 4                                  | 0.95                            | 10.43                                                                                                                                                      | 10.79 | 11.18 | 11.60 | 12.54  | 437475    | 1430HP 1X10X45X4              |                               |
| 1                                   | 45                                 | 1.00                                 | 12.00                              | 4                                  | 0.95                            | 12.50                                                                                                                                                      | 12.93 | 13.40 | 13.90 | 15.03  | 437476    | 1430HP 1X12X45X4              |                               |
| 1                                   | 45                                 | 1.00                                 | 14.00                              | 4                                  | 0.95                            | 14.56                                                                                                                                                      | 15.07 | 15.61 | 16.20 | 17.52  | 437895    | 1430HP 1X14X45X4              |                               |
| 1                                   | 50                                 | 1.00                                 | 16.00                              | 4                                  | 0.95                            | 16.63                                                                                                                                                      | 17.21 | 17.83 | 18.50 | 20.00  | 437477    | 1430HP 1X16X50X4              |                               |
| 1                                   | 50                                 | 1.00                                 | 18.00                              | 4                                  | 0.95                            | 18.70                                                                                                                                                      | 19.35 | 20.05 | 20.80 | 22.49  | 437896    | 1430HP 1X18X50X4              |                               |
| 1                                   | 50                                 | 1.00                                 | 20.00                              | 4                                  | 0.95                            | 20.76                                                                                                                                                      | 21.49 | 22.26 | 23.10 | 24.97  | 437897    | 1430HP 1X20X50X4              |                               |
| 1                                   | 60                                 | 1.00                                 | 25.00                              | 4                                  | 0.95                            | 25.93                                                                                                                                                      | 26.84 | 27.81 | 28.85 | libero | 437898    | 1430HP 1X25X60X4              |                               |
| 1                                   | 70                                 | 1.00                                 | 30.00                              | 4                                  | 0.95                            | 31.10                                                                                                                                                      | 32.19 | 33.35 | 34.60 | libero | 437899    | 1430HP 1X30X70X4              |                               |
| 1.2                                 | 45                                 | 1.20                                 | 4.00                               | 4                                  | 1.14                            | 4.25                                                                                                                                                       | 4.39  | 4.55  | 4.72  | 5.11   | 437900    | 1430HP 1.2X4X45X4             |                               |
| 1.2                                 | 45                                 | 1.20                                 | 6.00                               | 4                                  | 1.14                            | 6.31                                                                                                                                                       | 6.53  | 6.77  | 7.02  | 7.59   | 437901    | 1430HP 1.2X6X45X4             |                               |
| 1.2                                 | 45                                 | 1.20                                 | 8.00                               | 4                                  | 1.14                            | 8.38                                                                                                                                                       | 8.67  | 8.99  | 9.32  | 10.08  | 437902    | 1430HP 1.2X8X45X4             |                               |
| 1.2                                 | 45                                 | 1.20                                 | 10.00                              | 4                                  | 1.14                            | 10.45                                                                                                                                                      | 10.81 | 11.20 | 11.62 | 12.57  | 437903    | 1430HP 1.2X10X45X4            |                               |
| 1.2                                 | 45                                 | 1.20                                 | 12.00                              | 4                                  | 1.14                            | 12.51                                                                                                                                                      | 12.95 | 13.42 | 13.92 | 15.05  | 437904    | 1430HP 1.2X12X45X4            |                               |
| 1.2                                 | 50                                 | 1.20                                 | 16.00                              | 4                                  | 1.14                            | 16.65                                                                                                                                                      | 17.23 | 17.85 | 18.52 | 20.02  | 437905    | 1430HP 1.2X16X50X4            |                               |
| 1.2                                 | 50                                 | 1.20                                 | 20.00                              | 4                                  | 1.14                            | 20.78                                                                                                                                                      | 21.51 | 22.29 | 23.12 | 25.00  | 437906    | 1430HP 1.2X20X50X4            |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |        |        |        | 1430HP    |                               |                               |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|--------|--------|-----------|-------------------------------|-------------------------------|
|                                     |                                    |                                      |                                    |                                    |                                 | 30'                                                                                                                                                        | 1°    | 1°30'  | 2°     | 3°     | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  |                                                                                                                                                            |       |        |        |        |           |                               | €                             |
| 1.2                                 | 60                                 | 1.20                                 | 25.00                              | 4                                  | 1.14                            | 25.95                                                                                                                                                      | 26.86 | 27.83  | 28.87  | libero | 437907    | 1430HP 1.2X25X60X4            |                               |
| 1.5                                 | 45                                 | 1.50                                 | 4.00                               | 4                                  | 1.44                            | 4.25                                                                                                                                                       | 4.39  | 4.55   | 4.72   | 5.11   | 437478    | 1430HP 1.5X4X45X4             |                               |
| 1.5                                 | 45                                 | 1.50                                 | 6.00                               | 4                                  | 1.44                            | 6.31                                                                                                                                                       | 6.53  | 6.77   | 7.02   | 7.59   | 437479    | 1430HP 1.5X6X45X4             |                               |
| 1.5                                 | 45                                 | 1.50                                 | 8.00                               | 4                                  | 1.44                            | 8.38                                                                                                                                                       | 8.67  | 8.99   | 9.32   | 10.08  | 437908    | 1430HP 1.5X8X45X4             |                               |
| 1.5                                 | 45                                 | 1.50                                 | 10.00                              | 4                                  | 1.44                            | 10.45                                                                                                                                                      | 10.81 | 11.20  | 11.62  | 12.57  | 437480    | 1430HP 1.5X10X45X4            |                               |
| 1.5                                 | 45                                 | 1.50                                 | 12.00                              | 4                                  | 1.44                            | 12.51                                                                                                                                                      | 12.95 | 13.42  | 13.92  | 15.05  | 437909    | 1430HP 1.5X12X45X4            |                               |
| 1.5                                 | 50                                 | 1.50                                 | 16.00                              | 4                                  | 1.44                            | 16.65                                                                                                                                                      | 17.23 | 17.85  | 18.52  | 20.02  | 437481    | 1430HP 1.5X16X50X4            |                               |
| 1.5                                 | 50                                 | 1.50                                 | 18.00                              | 4                                  | 1.44                            | 18.72                                                                                                                                                      | 19.37 | 20.07  | 20.82  | 22.51  | 437910    | 1430HP 1.5X18X50X4            |                               |
| 1.5                                 | 50                                 | 1.50                                 | 20.00                              | 4                                  | 1.44                            | 20.78                                                                                                                                                      | 21.51 | 22.29  | 23.12  | libero | 437482    | 1430HP 1.5X20X50X4            |                               |
| 1.5                                 | 60                                 | 1.50                                 | 25.00                              | 4                                  | 1.44                            | 25.95                                                                                                                                                      | 26.86 | 27.83  | 28.87  | libero | 437911    | 1430HP 1.5X25X60X4            |                               |
| 1.5                                 | 70                                 | 1.50                                 | 30.00                              | 4                                  | 1.44                            | 31.12                                                                                                                                                      | 32.21 | 33.37  | 34.62  | libero | 437912    | 1430HP 1.5X30X70X4            |                               |
| 1.5                                 | 80                                 | 1.50                                 | 40.00                              | 4                                  | 1.44                            | 41.46                                                                                                                                                      | 42.90 | 44.45  | libero | libero | 437913    | 1430HP 1.5X40X80X4            |                               |
| 1.6                                 | 45                                 | 1.60                                 | 8.00                               | 4                                  | 1.55                            | 8.36                                                                                                                                                       | 8.65  | 8.96   | 9.30   | 10.06  | 437914    | 1430HP 1.6X8X45X4             |                               |
| 1.6                                 | 45                                 | 1.60                                 | 10.00                              | 4                                  | 1.55                            | 10.43                                                                                                                                                      | 10.79 | 11.18  | 11.60  | 12.54  | 437915    | 1430HP 1.6X10X45X4            |                               |
| 1.6                                 | 45                                 | 1.60                                 | 12.00                              | 4                                  | 1.55                            | 12.50                                                                                                                                                      | 12.93 | 13.40  | 13.90  | 15.03  | 437916    | 1430HP 1.6X12X45X4            |                               |
| 1.6                                 | 45                                 | 1.60                                 | 14.00                              | 4                                  | 1.55                            | 14.56                                                                                                                                                      | 15.07 | 15.61  | 16.20  | 17.52  | 437923    | 1430HP 1.6X14X45X4            |                               |
| 1.6                                 | 50                                 | 1.60                                 | 16.00                              | 4                                  | 1.55                            | 16.63                                                                                                                                                      | 17.21 | 17.83  | 18.50  | 20.00  | 437924    | 1430HP 1.6X16X50X4            |                               |
| 1.6                                 | 50                                 | 1.60                                 | 18.00                              | 4                                  | 1.55                            | 18.70                                                                                                                                                      | 19.35 | 20.05  | 20.80  | 22.49  | 437925    | 1430HP 1.6X18X50X4            |                               |
| 1.6                                 | 50                                 | 1.60                                 | 20.00                              | 4                                  | 1.55                            | 20.76                                                                                                                                                      | 21.49 | 22.26  | 23.10  | libero | 437926    | 1430HP 1.6X20X50X4            |                               |
| 1.8                                 | 45                                 | 1.80                                 | 8.00                               | 4                                  | 1.75                            | 8.36                                                                                                                                                       | 8.65  | 8.96   | 9.30   | 10.06  | 437927    | 1430HP 1.8X8X45X4             |                               |
| 1.8                                 | 45                                 | 1.80                                 | 10.00                              | 4                                  | 1.75                            | 10.43                                                                                                                                                      | 10.79 | 11.18  | 11.60  | 12.54  | 437928    | 1430HP 1.8X10X45X4            |                               |
| 1.8                                 | 45                                 | 1.80                                 | 12.00                              | 4                                  | 1.75                            | 12.50                                                                                                                                                      | 12.93 | 13.40  | 13.90  | 15.03  | 437929    | 1430HP 1.8X12X45X4            |                               |
| 1.8                                 | 45                                 | 1.80                                 | 14.00                              | 4                                  | 1.75                            | 14.56                                                                                                                                                      | 15.07 | 15.61  | 16.20  | 17.52  | 437930    | 1430HP 1.8X14X45X4            |                               |
| 1.8                                 | 50                                 | 1.80                                 | 16.00                              | 4                                  | 1.75                            | 16.63                                                                                                                                                      | 17.21 | 17.83  | 18.50  | 20.00  | 437932    | 1430HP 1.8X16X50X4            |                               |
| 1.8                                 | 50                                 | 1.80                                 | 18.00                              | 4                                  | 1.75                            | 18.70                                                                                                                                                      | 19.35 | 20.05  | 20.80  | libero | 437933    | 1430HP 1.8X18X50X4            |                               |
| 1.8                                 | 50                                 | 1.80                                 | 20.00                              | 4                                  | 1.75                            | 20.76                                                                                                                                                      | 21.49 | 22.26  | 23.10  | libero | 437934    | 1430HP 1.8X20X50X4            |                               |
| 2                                   | 45                                 | 2.00                                 | 4.00                               | 4                                  | 1.92                            | 4.28                                                                                                                                                       | 4.43  | 4.59   | 4.77   | 5.15   | 437483    | 1430HP 2X4X45X4               |                               |
| 2                                   | 45                                 | 2.00                                 | 6.00                               | 4                                  | 1.92                            | 6.35                                                                                                                                                       | 6.57  | 6.81   | 7.07   | 7.64   | 437484    | 1430HP 2X6X45X4               |                               |
| 2                                   | 45                                 | 2.00                                 | 8.00                               | 4                                  | 1.92                            | 8.42                                                                                                                                                       | 8.71  | 9.03   | 9.37   | 10.13  | 437485    | 1430HP 2X8X45X4               |                               |
| 2                                   | 45                                 | 2.00                                 | 10.00                              | 4                                  | 1.92                            | 10.49                                                                                                                                                      | 10.85 | 11.24  | 11.67  | 12.61  | 437486    | 1430HP 2X10X45X4              |                               |
| 2                                   | 45                                 | 2.00                                 | 12.00                              | 4                                  | 1.92                            | 12.55                                                                                                                                                      | 12.99 | 13.46  | 13.96  | 15.10  | 437487    | 1430HP 2X12X45X4              |                               |
| 2                                   | 45                                 | 2.00                                 | 14.00                              | 4                                  | 1.92                            | 14.62                                                                                                                                                      | 15.13 | 15.68  | 16.26  | 17.58  | 437935    | 1430HP 2X14X45X4              |                               |
| 2                                   | 50                                 | 2.00                                 | 16.00                              | 4                                  | 1.92                            | 16.69                                                                                                                                                      | 17.27 | 17.89  | 18.56  | libero | 437488    | 1430HP 2X16X50X4              |                               |
| 2                                   | 50                                 | 2.00                                 | 18.00                              | 4                                  | 1.92                            | 18.76                                                                                                                                                      | 19.41 | 20.11  | 20.86  | libero | 437936    | 1430HP 2X18X50X4              |                               |
| 2                                   | 50                                 | 2.00                                 | 20.00                              | 4                                  | 1.92                            | 20.82                                                                                                                                                      | 21.55 | 22.33  | 23.16  | libero | 437489    | 1430HP 2X20X50X4              |                               |
| 2                                   | 60                                 | 2.00                                 | 25.00                              | 4                                  | 1.92                            | 25.99                                                                                                                                                      | 26.90 | 27.87  | libero | libero | 437937    | 1430HP 2X25X60X4              |                               |
| 2                                   | 70                                 | 2.00                                 | 30.00                              | 4                                  | 1.92                            | 31.16                                                                                                                                                      | 32.25 | 33.41  | libero | libero | 437938    | 1430HP 2X30X70X4              |                               |
| 2                                   | 80                                 | 2.00                                 | 40.00                              | 4                                  | 1.92                            | 41.50                                                                                                                                                      | 42.94 | libero | libero | libero | 437939    | 1430HP 2X40X80X4              |                               |
| 2.5                                 | 45                                 | 2.50                                 | 10.00                              | 4                                  | 2.39                            | 10.54                                                                                                                                                      | 10.91 | 11.31  | 11.73  | 12.68  | 437940    | 1430HP 2.5X10X45X4            |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

Frese a testa piana con scarico in metallo duro integrale micrograna.  
Square end mills long neck in solid carbide micro grain.

| Diametro fresa<br>End mill diameter | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |        |        |        |        | 1430HP    |                               |                               |
|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--------|--------|-----------|-------------------------------|-------------------------------|
|                                     |                                    |                                      |                                    |                                    |                                 | 30'                                                                                                                                                        | 1°     | 1°30'  | 2°     | 3°     | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  |                                                                                                                                                            |        |        |        |        |           |                               | €                             |
| 2.5                                 | 45                                 | 2.50                                 | 12.00                              | 4                                  | 2.39                            | 12.61                                                                                                                                                      | 13.05  | 13.52  | 14.03  | libero | 437942    | 1430HP 2.5X12X45X4            |                               |
| 2.5                                 | 50                                 | 2.50                                 | 16.00                              | 4                                  | 2.39                            | 16.75                                                                                                                                                      | 17.33  | 17.96  | 18.63  | libero | 437943    | 1430HP 2.5X16X50X4            |                               |
| 2.5                                 | 50                                 | 2.50                                 | 20.00                              | 4                                  | 2.39                            | 20.88                                                                                                                                                      | 21.61  | 22.39  | libero | libero | 437944    | 1430HP 2.5X20X50X4            |                               |
| 2.5                                 | 60                                 | 2.50                                 | 25.00                              | 4                                  | 2.39                            | 26.05                                                                                                                                                      | 26.96  | 27.93  | libero | libero | 437946    | 1430HP 2.5X25X60X4            |                               |
| 2.5                                 | 70                                 | 2.50                                 | 30.00                              | 4                                  | 2.39                            | 31.22                                                                                                                                                      | 32.31  | libero | libero | libero | 437947    | 1430HP 2.5X30X70X4            |                               |
| 3                                   | 50                                 | 3.00                                 | 8.00                               | 6                                  | 2.86                            | 8.53                                                                                                                                                       | 8.83   | 9.15   | 9.49   | 10.26  | 437948    | 1430HP 3X8X50X6               |                               |
| 3                                   | 50                                 | 3.00                                 | 10.00                              | 6                                  | 2.86                            | 10.60                                                                                                                                                      | 10.97  | 11.37  | 11.79  | 12.75  | 437490    | 1430HP 3X10X50X6              |                               |
| 3                                   | 50                                 | 3.00                                 | 12.00                              | 6                                  | 2.86                            | 12.67                                                                                                                                                      | 13.11  | 13.58  | 14.09  | 15.24  | 437950    | 1430HP 3X12X50X6              |                               |
| 3                                   | 60                                 | 3.00                                 | 16.00                              | 6                                  | 2.86                            | 16.80                                                                                                                                                      | 17.39  | 18.02  | 18.69  | 20.21  | 437491    | 1430HP 3X16X60X6              |                               |
| 3                                   | 60                                 | 3.00                                 | 20.00                              | 6                                  | 2.86                            | 20.94                                                                                                                                                      | 21.67  | 22.45  | 23.29  | 25.18  | 437492    | 1430HP 3X20X60X6              |                               |
| 3                                   | 60                                 | 3.00                                 | 25.00                              | 6                                  | 2.86                            | 26.11                                                                                                                                                      | 27.02  | 27.99  | 29.04  | libero | 437951    | 1430HP 3X25X60X6              |                               |
| 3                                   | 70                                 | 3.00                                 | 30.00                              | 6                                  | 2.86                            | 31.28                                                                                                                                                      | 32.36  | 33.53  | 34.79  | libero | 437952    | 1430HP 3X30X70X6              |                               |
| 3                                   | 70                                 | 3.00                                 | 35.00                              | 6                                  | 2.86                            | 36.44                                                                                                                                                      | 37.71  | 39.08  | 40.54  | libero | 437953    | 1430HP 3X35X70X6              |                               |
| 3                                   | 80                                 | 3.00                                 | 40.00                              | 6                                  | 2.86                            | 41.61                                                                                                                                                      | 43.06  | 44.62  | libero | libero | 437954    | 1430HP 3X40X80X6              |                               |
| 4                                   | 50                                 | 4.00                                 | 10.00                              | 6                                  | 3.80                            | 10.72                                                                                                                                                      | 11.09  | 11.49  | 11.92  | 12.89  | 437955    | 1430HP 4X10X50X6              |                               |
| 4                                   | 50                                 | 4.00                                 | 12.00                              | 6                                  | 3.80                            | 12.78                                                                                                                                                      | 13.23  | 13.71  | 14.22  | 15.38  | 437493    | 1430HP 4X12X50X6              |                               |
| 4                                   | 50                                 | 4.00                                 | 14.00                              | 6                                  | 3.80                            | 14.85                                                                                                                                                      | 15.37  | 15.93  | 16.52  | 17.86  | 437956    | 1430HP 4X14X50X6              |                               |
| 4                                   | 60                                 | 4.00                                 | 16.00                              | 6                                  | 3.80                            | 16.92                                                                                                                                                      | 17.51  | 18.14  | 18.82  | libero | 437957    | 1430HP 4X16X60X6              |                               |
| 4                                   | 60                                 | 4.00                                 | 20.00                              | 6                                  | 3.80                            | 21.05                                                                                                                                                      | 21.79  | 22.57  | 23.42  | libero | 437494    | 1430HP 4X20X60X6              |                               |
| 4                                   | 60                                 | 4.00                                 | 25.00                              | 6                                  | 3.80                            | 26.22                                                                                                                                                      | 27.14  | 28.12  | libero | libero | 437958    | 1430HP 4X25X60X6              |                               |
| 4                                   | 70                                 | 4.00                                 | 30.00                              | 6                                  | 3.80                            | 31.39                                                                                                                                                      | 32.48  | 33.66  | libero | libero | 437960    | 1430HP 4X30X70X6              |                               |
| 4                                   | 70                                 | 4.00                                 | 35.00                              | 6                                  | 3.80                            | 36.56                                                                                                                                                      | 37.83  | libero | libero | libero | 437961    | 1430HP 4X35X70X6              |                               |
| 4                                   | 80                                 | 4.00                                 | 40.00                              | 6                                  | 3.80                            | 41.73                                                                                                                                                      | 43.18  | libero | libero | libero | 437962    | 1430HP 4X40X80X6              |                               |
| 4                                   | 100                                | 4.00                                 | 50.00                              | 6                                  | 3.80                            | 52.06                                                                                                                                                      | 53.88  | libero | libero | libero | 437963    | 1430HP 4X50X100X6             |                               |
| 5                                   | 60                                 | 5.00                                 | 16.00                              | 6                                  | 4.75                            | 17.02                                                                                                                                                      | 17.61  | 18.25  | libero | libero | 437964    | 1430HP 5X16X60X6              |                               |
| 5                                   | 60                                 | 5.00                                 | 20.00                              | 6                                  | 4.75                            | 21.15                                                                                                                                                      | 21.89  | libero | libero | libero | 437495    | 1430HP 5X20X60X6              |                               |
| 5                                   | 60                                 | 5.00                                 | 25.00                              | 6                                  | 4.75                            | 26.32                                                                                                                                                      | 27.24  | libero | libero | libero | 437966    | 1430HP 5X25X60X6              |                               |
| 5                                   | 70                                 | 5.00                                 | 30.00                              | 6                                  | 4.75                            | 31.49                                                                                                                                                      | libero | libero | libero | libero | 437496    | 1430HP 5X30X70X6              |                               |
| 5                                   | 70                                 | 5.00                                 | 35.00                              | 6                                  | 4.75                            | 36.66                                                                                                                                                      | libero | libero | libero | libero | 437967    | 1430HP 5X35X70X6              |                               |
| 5                                   | 80                                 | 5.00                                 | 40.00                              | 6                                  | 4.75                            | 41.82                                                                                                                                                      | libero | libero | libero | libero | 437968    | 1430HP 5X40X80X6              |                               |
| 5                                   | 100                                | 5.00                                 | 50.00                              | 6                                  | 4.75                            | 52.16                                                                                                                                                      | libero | libero | libero | libero | 437969    | 1430HP 5X50X100X6             |                               |
| 6                                   | 60                                 | 6.00                                 | 15.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 437970    | 1430HP 6X15X60X6              |                               |
| 6                                   | 60                                 | 6.00                                 | 20.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 437497    | 1430HP 6X20X60X6              |                               |
| 6                                   | 70                                 | 6.00                                 | 30.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 437498    | 1430HP 6X30X70X6              |                               |
| 6                                   | 80                                 | 6.00                                 | 40.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 437972    | 1430HP 6X40X80X6              |                               |
| 8                                   | 80                                 | 8.00                                 | 20.00                              | 8                                  | 7.60                            | libero                                                                                                                                                     | libero | libero | libero | libero | 437499    | 1430HP 8X20X80X8              |                               |
| 8                                   | 80                                 | 8.00                                 | 30.00                              | 8                                  | 7.60                            | libero                                                                                                                                                     | libero | libero | libero | libero | 437500    | 1430HP 8X30X80X8              |                               |
| 8                                   | 100                                | 8.00                                 | 40.00                              | 8                                  | 7.60                            | libero                                                                                                                                                     | libero | libero | libero | libero | 437973    | 1430HP 8X40X100X8             |                               |

**Frese toriche in metallo duro integrale micrograna.**  
Corner radius end mills in solid carbide micro grain.

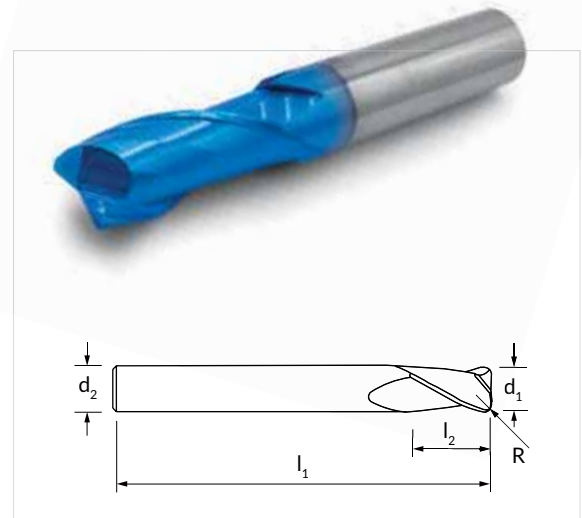
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## Operazioni di fresatura | Milling strategies:



## Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |                                |
|---|---|---|---|---|---|--------------------------------|
|   |   |   |   |   |   | ● Raccomandato - Most suitable |
|   |   |   |   |   |   | ○ Possibile - Possible         |



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø          | Raggio   Radius |
|----------------------------------|-----------------|
| d ≤ 6: 0/-0.01   d > 6: 0/-0.015 | ±0.01           |

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter |  |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|--|
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |  |
| 0.8                                 | 0.2                             | 50                                 | 1.6                                  | 6                                  |  |
| 1                                   | 0.1                             | 50                                 | 2.5                                  | 6                                  |  |
| 1                                   | 0.2                             | 50                                 | 2.5                                  | 6                                  |  |
| 1                                   | 0.3                             | 50                                 | 2.5                                  | 6                                  |  |
| 1.2                                 | 0.1                             | 50                                 | 3                                    | 6                                  |  |
| 1.2                                 | 0.2                             | 50                                 | 3                                    | 6                                  |  |
| 1.5                                 | 0.1                             | 50                                 | 4                                    | 6                                  |  |
| 1.5                                 | 0.2                             | 50                                 | 4                                    | 6                                  |  |
| 1.5                                 | 0.3                             | 50                                 | 4                                    | 6                                  |  |
| 1.5                                 | 0.5                             | 50                                 | 4                                    | 6                                  |  |
| 2                                   | 0.1                             | 50                                 | 6                                    | 6                                  |  |
| 2                                   | 0.2                             | 50                                 | 6                                    | 6                                  |  |
| 2                                   | 0.3                             | 50                                 | 6                                    | 6                                  |  |
| 2                                   | 0.5                             | 50                                 | 6                                    | 6                                  |  |
| 3                                   | 0.1                             | 60                                 | 8                                    | 6                                  |  |
| 3                                   | 0.2                             | 60                                 | 8                                    | 6                                  |  |
| 3                                   | 0.3                             | 60                                 | 8                                    | 6                                  |  |
| 3                                   | 0.5                             | 60                                 | 8                                    | 6                                  |  |

| 1432HP    |                               |                               |
|-----------|-------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
|           |                               | €                             |
| 437975    | 1432HP .8X.2X1.6X50X6         |                               |
| 437523    | 1432HP 1X.1X2.5X50X6          |                               |
| 437524    | 1432HP 1X.2X2.5X50X6          |                               |
| 437525    | 1432HP 1X.3X2.5X50X6          |                               |
| 437976    | 1432HP 1.2X.1X3X50X6          |                               |
| 437977    | 1432HP 1.2X.2X3X50X6          |                               |
| 437978    | 1432HP 1.5X.1X4X50X6          |                               |
| 437526    | 1432HP 1.5X.2X4X50X6          |                               |
| 437527    | 1432HP 1.5X.3X4X50X6          |                               |
| 437528    | 1432HP 1.5X.5X4X50X6          |                               |
| 437979    | 1432HP 2X.1X6X50X6            |                               |
| 437529    | 1432HP 2X.2X6X50X6            |                               |
| 437980    | 1432HP 2X.3X6X50X6            |                               |
| 437530    | 1432HP 2X.5X6X50X6            |                               |
| 437981    | 1432HP 3X.1X8X60X6            |                               |
| 437531    | 1432HP 3X.2X8X60X6            |                               |
| 437982    | 1432HP 3X.3X8X60X6            |                               |
| 437532    | 1432HP 3X.5X8X60X6            |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

Frese toriche in metallo duro integrale micrograna.  
Corner radius end mills in solid carbide micro grain.

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter | 1432HP    |                               |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|-----------|-------------------------------|-------------------------------|
|                                     |                                 |                                    |                                      |                                    | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |           |                               | €                             |
| 3                                   | 1.0                             | 60                                 | 8                                    | 6                                  | 437983    | 1432HP 3X1X8X60X6             |                               |
| 4                                   | 0.1                             | 60                                 | 11                                   | 6                                  | 437984    | 1432HP 4X.1X11X60X6           |                               |
| 4                                   | 0.2                             | 60                                 | 11                                   | 6                                  | 437755    | 1432HP 4X.2X11X60X6           |                               |
| 4                                   | 0.3                             | 60                                 | 11                                   | 6                                  | 437985    | 1432HP 4X.3X11X60X6           |                               |
| 4                                   | 0.5                             | 60                                 | 11                                   | 6                                  | 437534    | 1432HP 4X.5X11X60X6           |                               |
| 4                                   | 1.0                             | 60                                 | 11                                   | 6                                  | 437535    | 1432HP 4X1X11X60X6            |                               |
| 5                                   | 0.2                             | 60                                 | 15                                   | 6                                  | 437986    | 1432HP 5X.2X15X60X6           |                               |
| 6                                   | 0.1                             | 60                                 | 15                                   | 6                                  | 437987    | 1432HP 6X.1X15X60X6           |                               |
| 6                                   | 0.2                             | 60                                 | 15                                   | 6                                  | 437536    | 1432HP 6X.2X15X60X6           |                               |
| 6                                   | 0.3                             | 60                                 | 15                                   | 6                                  | 437988    | 1432HP 6X.3X15X60X6           |                               |
| 6                                   | 0.5                             | 60                                 | 15                                   | 6                                  | 437537    | 1432HP 6X.5X15X60X6           |                               |
| 6                                   | 1.0                             | 60                                 | 15                                   | 6                                  | 437538    | 1432HP 6X1X15X60X6            |                               |
| 6                                   | 1.5                             | 60                                 | 15                                   | 6                                  | 437989    | 1432HP 6X1.5X15X60X6          |                               |
| 8                                   | 0.1                             | 60                                 | 19                                   | 8                                  | 437990    | 1432HP 8X.1X19X60X8           |                               |
| 8                                   | 0.2                             | 60                                 | 19                                   | 8                                  | 437539    | 1432HP 8X.2X19X60X8           |                               |
| 8                                   | 0.3                             | 60                                 | 19                                   | 8                                  | 437991    | 1432HP 8X.3X19X60X8           |                               |
| 8                                   | 0.5                             | 60                                 | 19                                   | 8                                  | 437540    | 1432HP 8X.5X19X60X8           |                               |
| 8                                   | 1.0                             | 60                                 | 19                                   | 8                                  | 437541    | 1432HP 8X1X19X60X8            |                               |
| 8                                   | 2.0                             | 60                                 | 19                                   | 8                                  | 437992    | 1432HP 8X2X19X60X8            |                               |
| 10                                  | 0.2                             | 70                                 | 22                                   | 10                                 | 437542    | 1432HP 10X.2X22X70X10         |                               |
| 10                                  | 0.3                             | 70                                 | 22                                   | 10                                 | 437993    | 1432HP 10X.3X22X70X10         |                               |
| 10                                  | 0.5                             | 70                                 | 22                                   | 10                                 | 437543    | 1432HP 10X.5X22X70X10         |                               |
| 10                                  | 1.0                             | 70                                 | 22                                   | 10                                 | 437544    | 1432HP 10X1X22X70X10          |                               |
| 10                                  | 1.5                             | 70                                 | 22                                   | 10                                 | 437994    | 1432HP 10X1.5X22X70X10        |                               |
| 10                                  | 2.0                             | 70                                 | 22                                   | 10                                 | 437995    | 1432HP 10X2X22X70X10          |                               |
| 10                                  | 2.5                             | 70                                 | 22                                   | 10                                 | 437996    | 1432HP 10X2.5X22X70X10        |                               |
| 12                                  | 0.5                             | 75                                 | 26                                   | 12                                 | 437545    | 1432HP 12X.5X26X75X12         |                               |
| 12                                  | 1.0                             | 75                                 | 26                                   | 12                                 | 437546    | 1432HP 12X1X26X75X12          |                               |
| 12                                  | 1.5                             | 75                                 | 26                                   | 12                                 | 437997    | 1432HP 12X1.5X26X75X12        |                               |
| 12                                  | 2.0                             | 75                                 | 26                                   | 12                                 | 437998    | 1432HP 12X2X26X75X12          |                               |

**Frese toriche in metallo duro integrale micrograna.**  
Corner radius end mills in solid carbide micro grain.

|  |  |   |  |   |
|--|--|---|--|---|
|  |  |   |  | - |
|  |  | - |  |   |

## Operazioni di fresatura | Milling strategies:

|  |  |   |   |  |   |
|--|--|---|---|--|---|
|  |  | - | - |  | - |
|--|--|---|---|--|---|

## Gruppo materiali lavorabili | Group of working materials:

|          |          |          |          |          |          |                                |
|----------|----------|----------|----------|----------|----------|--------------------------------|
| <b>P</b> | <b>M</b> | <b>K</b> | <b>N</b> | <b>S</b> | <b>H</b> | ● Raccomandato - Most suitable |
| ○        | -        | ○        | -        | -        | ●        | ○ Possibile - Possible         |



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø      | Raggio   Radius |
|------------------------------|-----------------|
| d≤6: 0/-0.01   d>6: 0/-0.015 | ±0.01           |

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter |  |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|--|
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |  |
| 1.5                                 | 0.2                             | 45                                 | 4                                    | 4                                  |  |
| 1.5                                 | 0.3                             | 45                                 | 4                                    | 4                                  |  |
| 2                                   | 0.2                             | 45                                 | 6                                    | 4                                  |  |
| 2                                   | 0.3                             | 45                                 | 6                                    | 4                                  |  |
| 2                                   | 0.5                             | 45                                 | 6                                    | 4                                  |  |
| 3                                   | 0.2                             | 60                                 | 8                                    | 6                                  |  |
| 3                                   | 0.3                             | 60                                 | 8                                    | 6                                  |  |
| 3                                   | 0.5                             | 60                                 | 8                                    | 6                                  |  |
| 4                                   | 0.2                             | 60                                 | 11                                   | 6                                  |  |
| 4                                   | 0.3                             | 60                                 | 11                                   | 6                                  |  |
| 4                                   | 0.5                             | 60                                 | 11                                   | 6                                  |  |
| 4                                   | 1.0                             | 60                                 | 11                                   | 6                                  |  |
| 5                                   | 0.5                             | 60                                 | 11                                   | 6                                  |  |
| 6                                   | 0.2                             | 70                                 | 15                                   | 6                                  |  |
| 6                                   | 0.3                             | 70                                 | 15                                   | 6                                  |  |
| 6                                   | 0.5                             | 70                                 | 15                                   | 6                                  |  |
| 6                                   | 1.0                             | 70                                 | 15                                   | 6                                  |  |
| 6                                   | 1.5                             | 70                                 | 15                                   | 6                                  |  |

| 1434HP    |                               |                               |
|-----------|-------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
|           |                               | €                             |
| 437501    | 1434HP 1.5X.2X4X45X4          |                               |
| 437502    | 1434HP 1.5X.3X4X45X4          |                               |
| 437503    | 1434HP 2X.2X6X45X4            |                               |
| 437817    | 1434HP 2X.3X6X45X4            |                               |
| 437504    | 1434HP 2X.5X6X45X4            |                               |
| 437505    | 1434HP 3X.2X8X60X6            |                               |
| 437818    | 1434HP 3X.3X8X60X6            |                               |
| 437506    | 1434HP 3X.5X8X60X6            |                               |
| 437507    | 1434HP 4X.2X11X60X6           |                               |
| 437819    | 1434HP 4X.3X11X60X6           |                               |
| 437508    | 1434HP 4X.5X11X60X6           |                               |
| 437509    | 1434HP 4X1X11X60X6            |                               |
| 437820    | 1434HP 5X.5X11X60X6           |                               |
| 437510    | 1434HP 6X.2X15X70X6           |                               |
| 437821    | 1434HP 6X.3X15X70X6           |                               |
| 437511    | 1434HP 6X.5X15X70X6           |                               |
| 437512    | 1434HP 6X1X15X70X6            |                               |
| 437513    | 1434HP 6X1.5X15X70X6          |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

Frese toriche in metallo duro integrale micrograna.  
Corner radius end mills in solid carbide micro grain.

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter | 1434HP    |                               |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|-----------|-------------------------------|-------------------------------|
|                                     |                                 |                                    |                                      |                                    | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |           |                               | €                             |
| 8                                   | 0.2                             | 80                                 | 19                                   | 8                                  | 437514    | 1434HP 8X.2X19X80X8           |                               |
| 8                                   | 0.3                             | 80                                 | 19                                   | 8                                  | 437822    | 1434HP 8X.3X19X80X8           |                               |
| 8                                   | 0.5                             | 80                                 | 19                                   | 8                                  | 437515    | 1434HP 8X.5X19X80X8           |                               |
| 8                                   | 1.0                             | 80                                 | 19                                   | 8                                  | 437516    | 1434HP 8X1X19X80X8            |                               |
| 10                                  | 0.5                             | 80                                 | 22                                   | 10                                 | 437517    | 1434HP 10X.5X22X80X10         |                               |
| 10                                  | 1.0                             | 80                                 | 22                                   | 10                                 | 437518    | 1434HP 10X1X22X80X10          |                               |
| 10                                  | 1.5                             | 80                                 | 22                                   | 10                                 | 437519    | 1434HP 10X1.5X22X80X10        |                               |
| 12                                  | 0.5                             | 80                                 | 26                                   | 12                                 | 437520    | 1434HP 12X.5X26X80X12         |                               |
| 12                                  | 1.0                             | 80                                 | 26                                   | 12                                 | 437521    | 1434HP 12X1X26X80X12          |                               |
| 12                                  | 2.0                             | 80                                 | 26                                   | 12                                 | 437522    | 1434HP 12X2X26X80X12          |                               |

Frese toriche con scarico in metallo duro integrale micrograna.  
Corner radius long neck end mills in solid carbide micro grain.

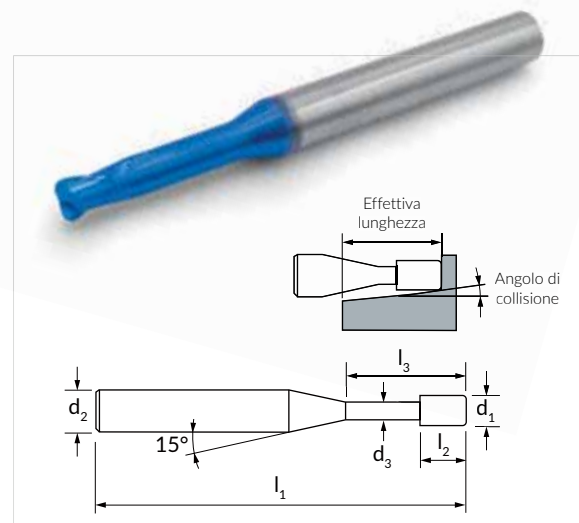
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|--|--|---|--|---|
|  |  |   |  | - |
|  |  | - |  |   |

#### Operazioni di fresatura | Milling strategies:

|  |  |   |   |  |   |
|--|--|---|---|--|---|
|  |  | - | - |  | - |
|--|--|---|---|--|---|

#### Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |                                                          |
|---|---|---|---|---|---|----------------------------------------------------------|
|   | - |   | - | - |   | ● Raccomandato - Most suitable<br>○ Possibile - Possible |



#### Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø          | Raggio   Radius |
|----------------------------------|-----------------|
| d ≤ 6: 0/-0.01   d > 6: 0/-0.015 | ±0.01           |

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |      |       |      |      |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|------|------|
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30°                                                                                                                                                        | 1°   | 1°30' | 2°   | 3°   |
| 0.2                                 | 0.02                            | 45                                 | 0.15                                 | 0.50                               | 4                                  | 0.18                            | 0.55                                                                                                                                                       | 0.57 | 0.59  | 0.61 | 0.66 |
| 0.2                                 | 0.02                            | 45                                 | 0.15                                 | 1.00                               | 4                                  | 0.18                            | 1.07                                                                                                                                                       | 1.10 | 1.14  | 1.18 | 1.28 |
| 0.2                                 | 0.02                            | 45                                 | 0.15                                 | 2.00                               | 4                                  | 0.18                            | 2.10                                                                                                                                                       | 2.17 | 2.25  | 2.33 | 2.52 |
| 0.2                                 | 0.05                            | 45                                 | 0.15                                 | 0.50                               | 4                                  | 0.18                            | 0.55                                                                                                                                                       | 0.57 | 0.59  | 0.61 | 0.65 |
| 0.2                                 | 0.05                            | 45                                 | 0.15                                 | 1.00                               | 4                                  | 0.18                            | 1.07                                                                                                                                                       | 1.10 | 1.14  | 1.18 | 1.27 |
| 0.2                                 | 0.05                            | 45                                 | 0.15                                 | 1.50                               | 4                                  | 0.18                            | 1.58                                                                                                                                                       | 1.64 | 1.69  | 1.76 | 1.89 |
| 0.2                                 | 0.05                            | 45                                 | 0.15                                 | 2.00                               | 4                                  | 0.18                            | 2.10                                                                                                                                                       | 2.17 | 2.25  | 2.33 | 2.52 |
| 0.3                                 | 0.02                            | 45                                 | 0.25                                 | 1.00                               | 4                                  | 0.28                            | 1.07                                                                                                                                                       | 1.10 | 1.14  | 1.18 | 1.28 |
| 0.3                                 | 0.02                            | 45                                 | 0.25                                 | 2.00                               | 4                                  | 0.28                            | 2.10                                                                                                                                                       | 2.17 | 2.25  | 2.33 | 2.52 |
| 0.3                                 | 0.02                            | 45                                 | 0.25                                 | 3.00                               | 4                                  | 0.28                            | 3.13                                                                                                                                                       | 3.24 | 3.36  | 3.48 | 3.77 |
| 0.3                                 | 0.05                            | 45                                 | 0.25                                 | 1.00                               | 4                                  | 0.28                            | 1.07                                                                                                                                                       | 1.10 | 1.14  | 1.18 | 1.27 |
| 0.3                                 | 0.05                            | 45                                 | 0.25                                 | 1.50                               | 4                                  | 0.28                            | 1.58                                                                                                                                                       | 1.64 | 1.69  | 1.76 | 1.89 |
| 0.3                                 | 0.05                            | 45                                 | 0.25                                 | 2.00                               | 4                                  | 0.28                            | 2.10                                                                                                                                                       | 2.17 | 2.25  | 2.33 | 2.52 |
| 0.3                                 | 0.05                            | 45                                 | 0.25                                 | 2.50                               | 4                                  | 0.28                            | 2.62                                                                                                                                                       | 2.71 | 2.80  | 2.91 | 3.14 |
| 0.3                                 | 0.05                            | 45                                 | 0.25                                 | 3.00                               | 4                                  | 0.28                            | 3.13                                                                                                                                                       | 3.24 | 3.36  | 3.48 | 3.76 |
| 0.4                                 | 0.02                            | 45                                 | 0.30                                 | 1.00                               | 4                                  | 0.37                            | 1.09                                                                                                                                                       | 1.12 | 1.16  | 1.21 | 1.30 |
| 0.4                                 | 0.02                            | 45                                 | 0.30                                 | 2.00                               | 4                                  | 0.37                            | 2.12                                                                                                                                                       | 2.19 | 2.27  | 2.36 | 2.55 |
| 0.4                                 | 0.02                            | 45                                 | 0.30                                 | 3.00                               | 4                                  | 0.37                            | 3.15                                                                                                                                                       | 3.26 | 3.38  | 3.51 | 3.79 |

| 1433HP    |                               |                               |
|-----------|-------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
|           |                               | €                             |
| 437999    | 1433HP .2X.02X.5X45X4         |                               |
| 438000    | 1433HP .2X.02X1X45X4          |                               |
| 438001    | 1433HP .2X.02X2X45X4          |                               |
| 438002    | 1433HP .2X.05X.5X45X4         |                               |
| 437547    | 1433HP .2X.05X1X45X4          |                               |
| 438003    | 1433HP .2X.05X1.5X45X4        |                               |
| 438004    | 1433HP .2X.05X2X45X4          |                               |
| 438005    | 1433HP .3X.02X1X45X4          |                               |
| 438006    | 1433HP .3X.02X2X45X4          |                               |
| 438007    | 1433HP .3X.02X3X45X4          |                               |
| 437548    | 1433HP .3X.05X1X45X4          |                               |
| 438008    | 1433HP .3X.05X1.5X45X4        |                               |
| 438009    | 1433HP .3X.05X2X45X4          |                               |
| 438011    | 1433HP .3X.05X2.5X45X4        |                               |
| 438012    | 1433HP .3X.05X3X45X4          |                               |
| 438013    | 1433HP .4X.02X1X45X4          |                               |
| 438014    | 1433HP .4X.02X2X45X4          |                               |
| 438015    | 1433HP .4X.02X3X45X4          |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

Frese toriche con scarico in metallo duro integrale micrograna.  
Corner radius long neck end mills in solid carbide micro grain.

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |      |       |      |      |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|------|------|
|                                     |                                 |                                    |                                      |                                    |                                    |                                 | 30°                                                                                                                                                        | 1°   | 1°30' | 2°   | 3°   |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  |                                                                                                                                                            |      |       |      |      |
| 0.4                                 | 0.02                            | 45                                 | 0.30                                 | 4.00                               | 4                                  | 0.37                            | 4.19                                                                                                                                                       | 4.33 | 4.49  | 4.66 | 5.03 |
| 0.4                                 | 0.05                            | 45                                 | 0.30                                 | 1.00                               | 4                                  | 0.37                            | 1.08                                                                                                                                                       | 1.12 | 1.16  | 1.20 | 1.30 |
| 0.4                                 | 0.05                            | 45                                 | 0.30                                 | 2.00                               | 4                                  | 0.37                            | 2.12                                                                                                                                                       | 2.19 | 2.27  | 2.35 | 2.54 |
| 0.4                                 | 0.05                            | 45                                 | 0.30                                 | 3.00                               | 4                                  | 0.37                            | 3.15                                                                                                                                                       | 3.26 | 3.38  | 3.50 | 3.78 |
| 0.4                                 | 0.05                            | 45                                 | 0.30                                 | 4.00                               | 4                                  | 0.37                            | 4.19                                                                                                                                                       | 4.33 | 4.48  | 4.65 | 5.03 |
| 0.4                                 | 0.1                             | 45                                 | 0.30                                 | 1.00                               | 4                                  | 0.37                            | 1.08                                                                                                                                                       | 1.12 | 1.15  | 1.19 | 1.28 |
| 0.4                                 | 0.1                             | 45                                 | 0.30                                 | 2.00                               | 4                                  | 0.37                            | 2.12                                                                                                                                                       | 2.19 | 2.26  | 2.34 | 2.53 |
| 0.4                                 | 0.1                             | 45                                 | 0.30                                 | 3.00                               | 4                                  | 0.37                            | 3.15                                                                                                                                                       | 3.26 | 3.37  | 3.49 | 3.77 |
| 0.4                                 | 0.1                             | 45                                 | 0.30                                 | 4.00                               | 4                                  | 0.37                            | 4.18                                                                                                                                                       | 4.33 | 4.48  | 4.64 | 5.01 |
| 0.5                                 | 0.02                            | 45                                 | 0.40                                 | 1.00                               | 4                                  | 0.47                            | 1.09                                                                                                                                                       | 1.12 | 1.16  | 1.21 | 1.30 |
| 0.5                                 | 0.02                            | 45                                 | 0.40                                 | 2.00                               | 4                                  | 0.47                            | 2.12                                                                                                                                                       | 2.19 | 2.27  | 2.36 | 2.55 |
| 0.5                                 | 0.02                            | 45                                 | 0.40                                 | 3.00                               | 4                                  | 0.47                            | 3.15                                                                                                                                                       | 3.26 | 3.38  | 3.51 | 3.79 |
| 0.5                                 | 0.02                            | 45                                 | 0.40                                 | 4.00                               | 4                                  | 0.47                            | 4.19                                                                                                                                                       | 4.33 | 4.49  | 4.66 | 5.03 |
| 0.5                                 | 0.02                            | 45                                 | 0.40                                 | 5.00                               | 4                                  | 0.47                            | 5.22                                                                                                                                                       | 5.40 | 5.60  | 5.81 | 6.28 |
| 0.5                                 | 0.05                            | 45                                 | 0.40                                 | 1.00                               | 4                                  | 0.47                            | 1.08                                                                                                                                                       | 1.12 | 1.16  | 1.20 | 1.30 |
| 0.5                                 | 0.05                            | 45                                 | 0.40                                 | 2.00                               | 4                                  | 0.47                            | 2.12                                                                                                                                                       | 2.19 | 2.27  | 2.35 | 2.54 |
| 0.5                                 | 0.05                            | 45                                 | 0.40                                 | 3.00                               | 4                                  | 0.47                            | 3.15                                                                                                                                                       | 3.26 | 3.38  | 3.50 | 3.78 |
| 0.5                                 | 0.05                            | 45                                 | 0.40                                 | 4.00                               | 4                                  | 0.47                            | 4.19                                                                                                                                                       | 4.33 | 4.48  | 4.65 | 5.03 |
| 0.5                                 | 0.05                            | 45                                 | 0.40                                 | 5.00                               | 4                                  | 0.47                            | 5.22                                                                                                                                                       | 5.40 | 5.59  | 5.80 | 6.27 |
| 0.5                                 | 0.1                             | 45                                 | 0.40                                 | 1.00                               | 4                                  | 0.47                            | 1.08                                                                                                                                                       | 1.12 | 1.15  | 1.19 | 1.28 |
| 0.5                                 | 0.1                             | 45                                 | 0.40                                 | 2.00                               | 4                                  | 0.47                            | 2.12                                                                                                                                                       | 2.19 | 2.26  | 2.34 | 2.53 |
| 0.5                                 | 0.1                             | 45                                 | 0.40                                 | 3.00                               | 4                                  | 0.47                            | 3.15                                                                                                                                                       | 3.26 | 3.37  | 3.49 | 3.77 |
| 0.5                                 | 0.1                             | 45                                 | 0.40                                 | 4.00                               | 4                                  | 0.47                            | 4.18                                                                                                                                                       | 4.33 | 4.48  | 4.64 | 5.01 |
| 0.5                                 | 0.1                             | 45                                 | 0.40                                 | 5.00                               | 4                                  | 0.47                            | 5.22                                                                                                                                                       | 5.40 | 5.59  | 5.79 | 6.26 |
| 0.6                                 | 0.02                            | 45                                 | 0.50                                 | 2.00                               | 4                                  | 0.57                            | 2.12                                                                                                                                                       | 2.19 | 2.27  | 2.36 | 2.55 |
| 0.6                                 | 0.02                            | 45                                 | 0.50                                 | 4.00                               | 4                                  | 0.57                            | 4.19                                                                                                                                                       | 4.33 | 4.49  | 4.66 | 5.03 |
| 0.6                                 | 0.02                            | 45                                 | 0.50                                 | 6.00                               | 4                                  | 0.57                            | 6.25                                                                                                                                                       | 6.47 | 6.70  | 6.96 | 7.52 |
| 0.6                                 | 0.05                            | 45                                 | 0.50                                 | 2.00                               | 4                                  | 0.57                            | 2.12                                                                                                                                                       | 2.19 | 2.27  | 2.35 | 2.54 |
| 0.6                                 | 0.05                            | 45                                 | 0.50                                 | 4.00                               | 4                                  | 0.57                            | 4.19                                                                                                                                                       | 4.33 | 4.48  | 4.65 | 5.03 |
| 0.6                                 | 0.05                            | 45                                 | 0.50                                 | 6.00                               | 4                                  | 0.57                            | 6.25                                                                                                                                                       | 6.47 | 6.70  | 6.95 | 7.51 |
| 0.6                                 | 0.1                             | 45                                 | 0.50                                 | 2.00                               | 4                                  | 0.57                            | 2.12                                                                                                                                                       | 2.19 | 2.26  | 2.34 | 2.53 |
| 0.6                                 | 0.1                             | 45                                 | 0.50                                 | 4.00                               | 4                                  | 0.57                            | 4.18                                                                                                                                                       | 4.33 | 4.48  | 4.64 | 5.01 |
| 0.6                                 | 0.1                             | 45                                 | 0.50                                 | 6.00                               | 4                                  | 0.57                            | 6.25                                                                                                                                                       | 6.47 | 6.70  | 6.94 | 7.50 |
| 0.7                                 | 0.05                            | 45                                 | 0.55                                 | 4.00                               | 4                                  | 0.66                            | 4.21                                                                                                                                                       | 4.35 | 4.51  | 4.67 | 5.05 |
| 0.7                                 | 0.05                            | 45                                 | 0.55                                 | 6.00                               | 4                                  | 0.66                            | 6.27                                                                                                                                                       | 6.49 | 6.72  | 6.97 | 7.53 |
| 0.7                                 | 0.1                             | 45                                 | 0.55                                 | 4.00                               | 4                                  | 0.66                            | 4.20                                                                                                                                                       | 4.35 | 4.50  | 4.67 | 5.04 |
| 0.7                                 | 0.1                             | 45                                 | 0.55                                 | 6.00                               | 4                                  | 0.66                            | 6.27                                                                                                                                                       | 6.49 | 6.72  | 6.96 | 7.52 |
| 0.8                                 | 0.02                            | 45                                 | 0.65                                 | 2.00                               | 4                                  | 0.77                            | 2.12                                                                                                                                                       | 2.19 | 2.27  | 2.36 | 2.55 |
| 0.8                                 | 0.02                            | 45                                 | 0.65                                 | 4.00                               | 4                                  | 0.77                            | 4.19                                                                                                                                                       | 4.33 | 4.49  | 4.66 | 5.03 |

| 1433HP    |                               |                                                                                     |                               |
|-----------|-------------------------------|-------------------------------------------------------------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code |  | Prezzo utensile<br>Tool Price |
|           |                               |                                                                                     | €                             |
| 438016    | 1433HP                        | .4X.02X4X45X4                                                                       |                               |
| 438017    | 1433HP                        | .4X.05X1X45X4                                                                       |                               |
| 438018    | 1433HP                        | .4X.05X2X45X4                                                                       |                               |
| 438019    | 1433HP                        | .4X.05X3X45X4                                                                       |                               |
| 438020    | 1433HP                        | .4X.05X4X45X4                                                                       |                               |
| 438021    | 1433HP                        | .4X.1X1X45X4                                                                        |                               |
| 437549    | 1433HP                        | .4X.1X2X45X4                                                                        |                               |
| 438022    | 1433HP                        | .4X.1X3X45X4                                                                        |                               |
| 438023    | 1433HP                        | .4X.1X4X45X4                                                                        |                               |
| 438024    | 1433HP                        | .5X.02X1X45X4                                                                       |                               |
| 438025    | 1433HP                        | .5X.02X2X45X4                                                                       |                               |
| 438026    | 1433HP                        | .5X.02X3X45X4                                                                       |                               |
| 438027    | 1433HP                        | .5X.02X4X45X4                                                                       |                               |
| 438028    | 1433HP                        | .5X.02X5X45X4                                                                       |                               |
| 438029    | 1433HP                        | .5X.05X1X45X4                                                                       |                               |
| 438030    | 1433HP                        | .5X.05X2X45X4                                                                       |                               |
| 438031    | 1433HP                        | .5X.05X3X45X4                                                                       |                               |
| 438032    | 1433HP                        | .5X.05X4X45X4                                                                       |                               |
| 438033    | 1433HP                        | .5X.05X5X45X4                                                                       |                               |
| 438034    | 1433HP                        | .5X.1X1X45X4                                                                        |                               |
| 437550    | 1433HP                        | .5X.1X2X45X4                                                                        |                               |
| 438035    | 1433HP                        | .5X.1X3X45X4                                                                        |                               |
| 438036    | 1433HP                        | .5X.1X4X45X4                                                                        |                               |
| 438037    | 1433HP                        | .5X.1X5X45X4                                                                        |                               |
| 438038    | 1433HP                        | .6X.02X2X45X4                                                                       |                               |
| 438039    | 1433HP                        | .6X.02X4X45X4                                                                       |                               |
| 438040    | 1433HP                        | .6X.02X6X45X4                                                                       |                               |
| 438041    | 1433HP                        | .6X.05X2X45X4                                                                       |                               |
| 438042    | 1433HP                        | .6X.05X4X45X4                                                                       |                               |
| 438043    | 1433HP                        | .6X.05X6X45X4                                                                       |                               |
| 437551    | 1433HP                        | .6X.1X2X45X4                                                                        |                               |
| 438044    | 1433HP                        | .6X.1X4X45X4                                                                        |                               |
| 438045    | 1433HP                        | .6X.1X6X45X4                                                                        |                               |
| 438046    | 1433HP                        | .7X.05X4X45X4                                                                       |                               |
| 438047    | 1433HP                        | .7X.05X6X45X4                                                                       |                               |
| 437552    | 1433HP                        | .7X.1X4X45X4                                                                        |                               |
| 438048    | 1433HP                        | .7X.1X6X45X4                                                                        |                               |
| 438049    | 1433HP                        | .8X.02X2X45X4                                                                       |                               |
| 438050    | 1433HP                        | .8X.02X4X45X4                                                                       |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |       |       |       |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30°                                                                                                                                                        | 1°    | 1°30' | 2°    | 3°    |
| 0.8                                 | 0.02                            | 45                                 | 0.65                                 | 6.00                               | 4                                  | 0.77                            | 6.25                                                                                                                                                       | 6.47  | 6.70  | 6.96  | 7.52  |
| 0.8                                 | 0.02                            | 45                                 | 0.65                                 | 8.00                               | 4                                  | 0.77                            | 8.32                                                                                                                                                       | 8.61  | 8.92  | 9.26  | 10.00 |
| 0.8                                 | 0.05                            | 45                                 | 0.65                                 | 2.00                               | 4                                  | 0.77                            | 2.12                                                                                                                                                       | 2.19  | 2.27  | 2.35  | 2.54  |
| 0.8                                 | 0.05                            | 45                                 | 0.65                                 | 4.00                               | 4                                  | 0.77                            | 4.19                                                                                                                                                       | 4.33  | 4.48  | 4.65  | 5.03  |
| 0.8                                 | 0.05                            | 45                                 | 0.65                                 | 6.00                               | 4                                  | 0.77                            | 6.25                                                                                                                                                       | 6.47  | 6.70  | 6.95  | 7.51  |
| 0.8                                 | 0.05                            | 45                                 | 0.65                                 | 8.00                               | 4                                  | 0.77                            | 8.32                                                                                                                                                       | 8.61  | 8.92  | 9.25  | 10.00 |
| 0.8                                 | 0.1                             | 45                                 | 0.65                                 | 2.00                               | 4                                  | 0.77                            | 2.12                                                                                                                                                       | 2.19  | 2.26  | 2.34  | 2.53  |
| 0.8                                 | 0.1                             | 45                                 | 0.65                                 | 4.00                               | 4                                  | 0.77                            | 4.18                                                                                                                                                       | 4.33  | 4.48  | 4.64  | 5.01  |
| 0.8                                 | 0.1                             | 45                                 | 0.65                                 | 6.00                               | 4                                  | 0.77                            | 6.25                                                                                                                                                       | 6.47  | 6.70  | 6.94  | 7.50  |
| 0.8                                 | 0.1                             | 45                                 | 0.65                                 | 8.00                               | 4                                  | 0.77                            | 8.32                                                                                                                                                       | 8.61  | 8.91  | 9.24  | 9.99  |
| 0.8                                 | 0.2                             | 45                                 | 0.65                                 | 2.00                               | 4                                  | 0.77                            | 2.11                                                                                                                                                       | 2.18  | 2.25  | 2.33  | 2.50  |
| 0.8                                 | 0.2                             | 45                                 | 0.65                                 | 4.00                               | 4                                  | 0.77                            | 4.18                                                                                                                                                       | 4.32  | 4.47  | 4.63  | 4.99  |
| 0.8                                 | 0.2                             | 45                                 | 0.65                                 | 6.00                               | 4                                  | 0.77                            | 6.25                                                                                                                                                       | 6.46  | 6.69  | 6.93  | 7.47  |
| 0.8                                 | 0.2                             | 45                                 | 0.65                                 | 8.00                               | 4                                  | 0.77                            | 8.32                                                                                                                                                       | 8.60  | 8.90  | 9.23  | 9.96  |
| 0.9                                 | 0.1                             | 45                                 | 0.70                                 | 4.00                               | 4                                  | 0.85                            | 4.22                                                                                                                                                       | 4.37  | 4.52  | 4.69  | 5.06  |
| 0.9                                 | 0.1                             | 45                                 | 0.70                                 | 8.00                               | 4                                  | 0.85                            | 8.36                                                                                                                                                       | 8.65  | 8.95  | 9.29  | 10.03 |
| 1                                   | 0.02                            | 45                                 | 0.80                                 | 2.00                               | 4                                  | 0.95                            | 2.16                                                                                                                                                       | 2.23  | 2.31  | 2.40  | 2.59  |
| 1                                   | 0.02                            | 45                                 | 0.80                                 | 4.00                               | 4                                  | 0.95                            | 4.23                                                                                                                                                       | 4.37  | 4.53  | 4.70  | 5.08  |
| 1                                   | 0.02                            | 45                                 | 0.80                                 | 6.00                               | 4                                  | 0.95                            | 6.29                                                                                                                                                       | 6.51  | 6.75  | 7.00  | 7.56  |
| 1                                   | 0.02                            | 45                                 | 0.80                                 | 8.00                               | 4                                  | 0.95                            | 8.36                                                                                                                                                       | 8.65  | 8.96  | 9.30  | 10.05 |
| 1                                   | 0.02                            | 45                                 | 0.80                                 | 10.00                              | 4                                  | 0.95                            | 10.43                                                                                                                                                      | 10.79 | 11.18 | 11.60 | 12.54 |
| 1                                   | 0.05                            | 45                                 | 0.80                                 | 2.00                               | 4                                  | 0.95                            | 2.16                                                                                                                                                       | 2.23  | 2.31  | 2.39  | 2.59  |
| 1                                   | 0.05                            | 45                                 | 0.80                                 | 4.00                               | 4                                  | 0.95                            | 4.22                                                                                                                                                       | 4.37  | 4.53  | 4.69  | 5.07  |
| 1                                   | 0.05                            | 45                                 | 0.80                                 | 6.00                               | 4                                  | 0.95                            | 6.29                                                                                                                                                       | 6.51  | 6.74  | 6.99  | 7.56  |
| 1                                   | 0.05                            | 45                                 | 0.80                                 | 8.00                               | 4                                  | 0.95                            | 8.36                                                                                                                                                       | 8.65  | 8.96  | 9.29  | 10.04 |
| 1                                   | 0.05                            | 45                                 | 0.80                                 | 10.00                              | 4                                  | 0.95                            | 10.43                                                                                                                                                      | 10.79 | 11.18 | 11.59 | 12.53 |
| 1                                   | 0.05                            | 45                                 | 0.80                                 | 12.00                              | 4                                  | 0.95                            | 12.49                                                                                                                                                      | 12.93 | 13.39 | 13.89 | 15.02 |
| 1                                   | 0.05                            | 50                                 | 0.80                                 | 16.00                              | 4                                  | 0.95                            | 16.63                                                                                                                                                      | 17.21 | 17.83 | 18.49 | 19.99 |
| 1                                   | 0.05                            | 50                                 | 0.80                                 | 20.00                              | 4                                  | 0.95                            | 20.76                                                                                                                                                      | 21.48 | 22.26 | 23.09 | 24.96 |
| 1                                   | 0.1                             | 45                                 | 0.80                                 | 2.00                               | 4                                  | 0.95                            | 2.16                                                                                                                                                       | 2.23  | 2.30  | 2.39  | 2.57  |
| 1                                   | 0.1                             | 45                                 | 0.80                                 | 4.00                               | 4                                  | 0.95                            | 4.22                                                                                                                                                       | 4.37  | 4.52  | 4.69  | 5.06  |
| 1                                   | 0.1                             | 45                                 | 0.80                                 | 6.00                               | 4                                  | 0.95                            | 6.29                                                                                                                                                       | 6.51  | 6.74  | 6.99  | 7.55  |
| 1                                   | 0.1                             | 45                                 | 0.80                                 | 8.00                               | 4                                  | 0.95                            | 8.36                                                                                                                                                       | 8.65  | 8.95  | 9.29  | 10.03 |
| 1                                   | 0.1                             | 45                                 | 0.80                                 | 10.00                              | 4                                  | 0.95                            | 10.42                                                                                                                                                      | 10.78 | 11.17 | 11.59 | 12.52 |
| 1                                   | 0.1                             | 45                                 | 0.80                                 | 12.00                              | 4                                  | 0.95                            | 12.49                                                                                                                                                      | 12.92 | 13.39 | 13.89 | 15.00 |
| 1                                   | 0.1                             | 50                                 | 0.80                                 | 16.00                              | 4                                  | 0.95                            | 16.63                                                                                                                                                      | 17.20 | 17.82 | 18.48 | 19.98 |
| 1                                   | 0.1                             | 50                                 | 0.80                                 | 20.00                              | 4                                  | 0.95                            | 20.76                                                                                                                                                      | 21.48 | 22.25 | 23.08 | 24.95 |
| 1                                   | 0.2                             | 45                                 | 0.80                                 | 2.00                               | 4                                  | 0.95                            | 2.15                                                                                                                                                       | 2.22  | 2.29  | 2.37  | 2.55  |
| 1                                   | 0.2                             | 45                                 | 0.80                                 | 4.00                               | 4                                  | 0.95                            | 4.22                                                                                                                                                       | 4.36  | 4.51  | 4.67  | 5.03  |

| 1433HP    |                               |                                                                                     |                               |
|-----------|-------------------------------|-------------------------------------------------------------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code |  | Prezzo utensile<br>Tool Price |
|           |                               |                                                                                     | €                             |
| 438051    | 1433HP                        | .8X.02X6X45X4                                                                       |                               |
| 438052    | 1433HP                        | .8X.02X8X45X4                                                                       |                               |
| 438053    | 1433HP                        | .8X.05X2X45X4                                                                       |                               |
| 438054    | 1433HP                        | .8X.05X4X45X4                                                                       |                               |
| 438055    | 1433HP                        | .8X.05X6X45X4                                                                       |                               |
| 438056    | 1433HP                        | .8X.05X8X45X4                                                                       |                               |
| 438057    | 1433HP                        | .8X.1X2X45X4                                                                        |                               |
| 438058    | 1433HP                        | .8X.1X4X45X4                                                                        |                               |
| 438059    | 1433HP                        | .8X.1X6X45X4                                                                        |                               |
| 438060    | 1433HP                        | .8X.1X8X45X4                                                                        |                               |
| 438061    | 1433HP                        | .8X.2X2X45X4                                                                        |                               |
| 437553    | 1433HP                        | .8X.2X4X45X4                                                                        |                               |
| 437554    | 1433HP                        | .8X.2X6X45X4                                                                        |                               |
| 437555    | 1433HP                        | .8X.2X8X45X4                                                                        |                               |
| 438062    | 1433HP                        | .9X.1X4X45X4                                                                        |                               |
| 438063    | 1433HP                        | .9X.1X8X45X4                                                                        |                               |
| 438064    | 1433HP                        | 1X.02X2X45X4                                                                        |                               |
| 438065    | 1433HP                        | 1X.02X4X45X4                                                                        |                               |
| 438066    | 1433HP                        | 1X.02X6X45X4                                                                        |                               |
| 438067    | 1433HP                        | 1X.02X8X45X4                                                                        |                               |
| 438068    | 1433HP                        | 1X.02X10X45X4                                                                       |                               |
| 438069    | 1433HP                        | 1X.05X2X45X4                                                                        |                               |
| 438070    | 1433HP                        | 1X.05X4X45X4                                                                        |                               |
| 438071    | 1433HP                        | 1X.05X6X45X4                                                                        |                               |
| 438072    | 1433HP                        | 1X.05X8X45X4                                                                        |                               |
| 438073    | 1433HP                        | 1X.05X10X45X4                                                                       |                               |
| 438074    | 1433HP                        | 1X.05X12X45X4                                                                       |                               |
| 438075    | 1433HP                        | 1X.05X16X50X4                                                                       |                               |
| 438076    | 1433HP                        | 1X.05X20X50X4                                                                       |                               |
| 438077    | 1433HP                        | 1X.1X2X45X4                                                                         |                               |
| 438078    | 1433HP                        | 1X.1X4X45X4                                                                         |                               |
| 438080    | 1433HP                        | 1X.1X6X45X4                                                                         |                               |
| 438081    | 1433HP                        | 1X.1X8X45X4                                                                         |                               |
| 438082    | 1433HP                        | 1X.1X10X45X4                                                                        |                               |
| 438083    | 1433HP                        | 1X.1X12X45X4                                                                        |                               |
| 438084    | 1433HP                        | 1X.1X16X50X4                                                                        |                               |
| 438085    | 1433HP                        | 1X.1X20X50X4                                                                        |                               |
| 437556    | 1433HP                        | 1X.2X2X45X4                                                                         |                               |
| 437557    | 1433HP                        | 1X.2X4X45X4                                                                         |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page &gt;&gt;

Frese toriche con scarico in metallo duro integrale micrograna.  
Corner radius long neck end mills in solid carbide micro grain.

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |       |       |        | 1433HP    |                               |                 | Prezzo utensile<br>Tool Price |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|--------|-----------|-------------------------------|-----------------|-------------------------------|
|                                     |                                 |                                    |                                      |                                    |                                    |                                 | 30°                                                                                                                                                        | 1°    | 1°30' | 2°    | 3°     | ART. NUM. | Codice d'ordine<br>Order code | HA<br>6335      |                               |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  |                                                                                                                                                            |       |       |       |        |           |                               |                 | €                             |
| 1                                   | 0.2                             | 45                                 | 0.80                                 | 6.00                               | 4                                  | 0.95                            | 6.29                                                                                                                                                       | 6.50  | 6.73  | 6.97  | 7.52   | 437558    | 1433HP                        | 1X.2X6X45X4     |                               |
| 1                                   | 0.2                             | 45                                 | 0.80                                 | 8.00                               | 4                                  | 0.95                            | 8.35                                                                                                                                                       | 8.64  | 8.94  | 9.27  | 10.01  | 437559    | 1433HP                        | 1X.2X8X45X4     |                               |
| 1                                   | 0.2                             | 45                                 | 0.80                                 | 10.00                              | 4                                  | 0.95                            | 10.42                                                                                                                                                      | 10.78 | 11.16 | 11.57 | 12.49  | 437560    | 1433HP                        | 1X.2X10X45X4    |                               |
| 1                                   | 0.2                             | 45                                 | 0.80                                 | 12.00                              | 4                                  | 0.95                            | 12.49                                                                                                                                                      | 12.92 | 13.38 | 13.87 | 14.98  | 437561    | 1433HP                        | 1X.2X12X45X4    |                               |
| 1                                   | 0.2                             | 50                                 | 0.80                                 | 16.00                              | 4                                  | 0.95                            | 16.62                                                                                                                                                      | 17.20 | 17.81 | 18.47 | 19.95  | 437562    | 1433HP                        | 1X.2X16X50X4    |                               |
| 1                                   | 0.2                             | 50                                 | 0.80                                 | 20.00                              | 4                                  | 0.95                            | 20.76                                                                                                                                                      | 21.47 | 22.24 | 23.07 | 24.93  | 437563    | 1433HP                        | 1X.2X20X50X4    |                               |
| 1                                   | 0.3                             | 45                                 | 0.80                                 | 2.00                               | 4                                  | 0.95                            | 2.15                                                                                                                                                       | 2.21  | 2.28  | 2.36  | 2.52   | 438086    | 1433HP                        | 1X.3X2X45X4     |                               |
| 1                                   | 0.3                             | 45                                 | 0.80                                 | 4.00                               | 4                                  | 0.95                            | 4.22                                                                                                                                                       | 4.35  | 4.50  | 4.66  | 5.01   | 438087    | 1433HP                        | 1X.3X4X45X4     |                               |
| 1                                   | 0.3                             | 45                                 | 0.80                                 | 6.00                               | 4                                  | 0.95                            | 6.28                                                                                                                                                       | 6.49  | 6.72  | 6.96  | 7.50   | 438088    | 1433HP                        | 1X.3X6X45X4     |                               |
| 1                                   | 0.3                             | 45                                 | 0.80                                 | 8.00                               | 4                                  | 0.95                            | 8.35                                                                                                                                                       | 8.63  | 8.93  | 9.26  | 9.98   | 438089    | 1433HP                        | 1X.3X8X45X4     |                               |
| 1                                   | 0.3                             | 45                                 | 0.80                                 | 10.00                              | 4                                  | 0.95                            | 10.42                                                                                                                                                      | 10.77 | 11.15 | 11.56 | 12.47  | 438090    | 1433HP                        | 1X.3X10X45X4    |                               |
| 1                                   | 0.3                             | 45                                 | 0.80                                 | 12.00                              | 4                                  | 0.95                            | 12.49                                                                                                                                                      | 12.91 | 13.37 | 13.86 | 14.96  | 438091    | 1433HP                        | 1X.3X12X45X4    |                               |
| 1                                   | 0.3                             | 50                                 | 0.80                                 | 16.00                              | 4                                  | 0.95                            | 16.62                                                                                                                                                      | 17.19 | 17.80 | 18.46 | 19.93  | 438092    | 1433HP                        | 1X.3X16X50X4    |                               |
| 1                                   | 0.3                             | 50                                 | 0.80                                 | 20.00                              | 4                                  | 0.95                            | 20.75                                                                                                                                                      | 21.47 | 22.23 | 23.05 | 24.90  | 438093    | 1433HP                        | 1X.3X20X50X4    |                               |
| 1.2                                 | 0.1                             | 45                                 | 1.00                                 | 4.00                               | 4                                  | 1.14                            | 4.24                                                                                                                                                       | 4.39  | 4.54  | 4.71  | 5.08   | 438094    | 1433HP                        | 1.2X.1X4X45X4   |                               |
| 1.2                                 | 0.1                             | 45                                 | 1.00                                 | 6.00                               | 4                                  | 1.14                            | 6.31                                                                                                                                                       | 6.53  | 6.76  | 7.01  | 7.57   | 438095    | 1433HP                        | 1.2X.1X6X45X4   |                               |
| 1.2                                 | 0.1                             | 45                                 | 1.00                                 | 10.00                              | 4                                  | 1.14                            | 10.44                                                                                                                                                      | 10.80 | 11.19 | 11.61 | 12.54  | 438096    | 1433HP                        | 1.2X.1X10X45X4  |                               |
| 1.2                                 | 0.2                             | 45                                 | 1.00                                 | 4.00                               | 4                                  | 1.14                            | 4.24                                                                                                                                                       | 4.38  | 4.53  | 4.69  | 5.06   | 437564    | 1433HP                        | 1.2X.2X4X45X4   |                               |
| 1.2                                 | 0.2                             | 45                                 | 1.00                                 | 6.00                               | 4                                  | 1.14                            | 6.31                                                                                                                                                       | 6.52  | 6.75  | 6.99  | 7.54   | 437565    | 1433HP                        | 1.2X.2X6X45X4   |                               |
| 1.2                                 | 0.2                             | 45                                 | 1.00                                 | 10.00                              | 4                                  | 1.14                            | 10.44                                                                                                                                                      | 10.80 | 11.18 | 11.59 | 12.52  | 437566    | 1433HP                        | 1.2X.2X10X45X4  |                               |
| 1.2                                 | 0.3                             | 45                                 | 1.00                                 | 4.00                               | 4                                  | 1.14                            | 4.24                                                                                                                                                       | 4.37  | 4.52  | 4.68  | 5.03   | 438097    | 1433HP                        | 1.2X.3X4X45X4   |                               |
| 1.2                                 | 0.3                             | 45                                 | 1.00                                 | 6.00                               | 4                                  | 1.14                            | 6.30                                                                                                                                                       | 6.51  | 6.74  | 6.98  | 7.52   | 438098    | 1433HP                        | 1.2X.3X6X45X4   |                               |
| 1.2                                 | 0.3                             | 45                                 | 1.00                                 | 10.00                              | 4                                  | 1.14                            | 10.44                                                                                                                                                      | 10.79 | 11.17 | 11.58 | 12.49  | 438099    | 1433HP                        | 1.2X.3X10X45X4  |                               |
| 1.5                                 | 0.05                            | 45                                 | 1.50                                 | 3.00                               | 4                                  | 1.44                            | 3.21                                                                                                                                                       | 3.32  | 3.44  | 3.57  | 3.85   | 438100    | 1433HP                        | 1.5X.05X3X45X4  |                               |
| 1.5                                 | 0.05                            | 45                                 | 1.50                                 | 4.00                               | 4                                  | 1.44                            | 4.24                                                                                                                                                       | 4.39  | 4.55  | 4.72  | 5.09   | 438101    | 1433HP                        | 1.5X.05X4X45X4  |                               |
| 1.5                                 | 0.05                            | 45                                 | 1.50                                 | 6.00                               | 4                                  | 1.44                            | 6.31                                                                                                                                                       | 6.53  | 6.76  | 7.02  | 7.58   | 438102    | 1433HP                        | 1.5X.05X6X45X4  |                               |
| 1.5                                 | 0.05                            | 45                                 | 1.50                                 | 8.00                               | 4                                  | 1.44                            | 8.38                                                                                                                                                       | 8.67  | 8.98  | 9.32  | 10.07  | 438103    | 1433HP                        | 1.5X.05X8X45X4  |                               |
| 1.5                                 | 0.05                            | 45                                 | 1.50                                 | 10.00                              | 4                                  | 1.44                            | 10.45                                                                                                                                                      | 10.81 | 11.20 | 11.61 | 12.55  | 438104    | 1433HP                        | 1.5X.05X10X45X4 |                               |
| 1.5                                 | 0.05                            | 45                                 | 1.50                                 | 12.00                              | 4                                  | 1.44                            | 12.51                                                                                                                                                      | 12.95 | 13.41 | 13.91 | 15.04  | 438105    | 1433HP                        | 1.5X.05X12X45X4 |                               |
| 1.5                                 | 0.05                            | 50                                 | 1.50                                 | 16.00                              | 4                                  | 1.44                            | 16.65                                                                                                                                                      | 17.23 | 17.85 | 18.51 | 20.01  | 438106    | 1433HP                        | 1.5X.05X16X50X4 |                               |
| 1.5                                 | 0.05                            | 50                                 | 1.50                                 | 20.00                              | 4                                  | 1.44                            | 20.78                                                                                                                                                      | 21.50 | 22.28 | 23.11 | libero | 438107    | 1433HP                        | 1.5X.05X20X50X4 |                               |
| 1.5                                 | 0.1                             | 45                                 | 1.50                                 | 3.00                               | 4                                  | 1.44                            | 3.21                                                                                                                                                       | 3.32  | 3.43  | 3.56  | 3.84   | 438108    | 1433HP                        | 1.5X.1X3X45X4   |                               |
| 1.5                                 | 0.1                             | 45                                 | 1.50                                 | 4.00                               | 4                                  | 1.44                            | 4.24                                                                                                                                                       | 4.39  | 4.54  | 4.71  | 5.08   | 438109    | 1433HP                        | 1.5X.1X4X45X4   |                               |
| 1.5                                 | 0.1                             | 45                                 | 1.50                                 | 6.00                               | 4                                  | 1.44                            | 6.31                                                                                                                                                       | 6.53  | 6.76  | 7.01  | 7.57   | 438110    | 1433HP                        | 1.5X.1X6X45X4   |                               |
| 1.5                                 | 0.1                             | 45                                 | 1.50                                 | 8.00                               | 4                                  | 1.44                            | 8.38                                                                                                                                                       | 8.67  | 8.97  | 9.31  | 10.06  | 438111    | 1433HP                        | 1.5X.1X8X45X4   |                               |
| 1.5                                 | 0.1                             | 45                                 | 1.50                                 | 10.00                              | 4                                  | 1.44                            | 10.44                                                                                                                                                      | 10.80 | 11.19 | 11.61 | 12.54  | 438112    | 1433HP                        | 1.5X.1X10X45X4  |                               |
| 1.5                                 | 0.1                             | 45                                 | 1.50                                 | 12.00                              | 4                                  | 1.44                            | 12.51                                                                                                                                                      | 12.94 | 13.41 | 13.91 | 15.03  | 438113    | 1433HP                        | 1.5X.1X12X45X4  |                               |
| 1.5                                 | 0.1                             | 50                                 | 1.50                                 | 16.00                              | 4                                  | 1.44                            | 16.65                                                                                                                                                      | 17.22 | 17.84 | 18.51 | 20.00  | 438114    | 1433HP                        | 1.5X.1X16X50X4  |                               |
| 1.5                                 | 0.1                             | 50                                 | 1.50                                 | 20.00                              | 4                                  | 1.44                            | 20.78                                                                                                                                                      | 21.50 | 22.27 | 23.11 | libero | 438115    | 1433HP                        | 1.5X.1X20X50X4  |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

|                                     |                                 |                                    |                                      |                                    |                                    |                                 |                                                                                                                                                            |       |       |       |        | 1433HP    |                               |                                                                                     |  |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|--------|-----------|-------------------------------|-------------------------------------------------------------------------------------|--|-------------------------------|
| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |       |       |        | ART. NUM. | Codice d'ordine<br>Order code |  |  | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30'                                                                                                                                                        | 1°    | 1°30' | 2°    | 3°     |           |                               | €                                                                                   |  |                               |
| 1.5                                 | 0.2                             | 45                                 | 1.50                                 | 3.00                               | 4                                  | 1.44                            | 3.20                                                                                                                                                       | 3.31  | 3.42  | 3.54  | 3.81   | 438116    | 1433HP                        | 1.5X.2X3X45X4                                                                       |  |                               |
| 1.5                                 | 0.2                             | 45                                 | 1.50                                 | 4.00                               | 4                                  | 1.44                            | 4.24                                                                                                                                                       | 4.38  | 4.53  | 4.69  | 5.06   | 438117    | 1433HP                        | 1.5X.2X4X45X4                                                                       |  |                               |
| 1.5                                 | 0.2                             | 45                                 | 1.50                                 | 6.00                               | 4                                  | 1.44                            | 6.31                                                                                                                                                       | 6.52  | 6.75  | 6.99  | 7.54   | 437567    | 1433HP                        | 1.5X.2X6X45X4                                                                       |  |                               |
| 1.5                                 | 0.2                             | 45                                 | 1.50                                 | 8.00                               | 4                                  | 1.44                            | 8.37                                                                                                                                                       | 8.66  | 8.96  | 9.29  | 10.03  | 437568    | 1433HP                        | 1.5X.2X8X45X4                                                                       |  |                               |
| 1.5                                 | 0.2                             | 45                                 | 1.50                                 | 10.00                              | 4                                  | 1.44                            | 10.44                                                                                                                                                      | 10.80 | 11.18 | 11.59 | 12.52  | 437569    | 1433HP                        | 1.5X.2X10X45X4                                                                      |  |                               |
| 1.5                                 | 0.2                             | 45                                 | 1.50                                 | 12.00                              | 4                                  | 1.44                            | 12.51                                                                                                                                                      | 12.94 | 13.40 | 13.89 | 15.00  | 437570    | 1433HP                        | 1.5X.2X12X45X4                                                                      |  |                               |
| 1.5                                 | 0.2                             | 50                                 | 1.50                                 | 16.00                              | 4                                  | 1.44                            | 16.64                                                                                                                                                      | 17.22 | 17.83 | 18.49 | 19.98  | 437571    | 1433HP                        | 1.5X.2X16X50X4                                                                      |  |                               |
| 1.5                                 | 0.2                             | 50                                 | 1.50                                 | 20.00                              | 4                                  | 1.44                            | 20.78                                                                                                                                                      | 21.49 | 22.26 | 23.09 | libero | 437572    | 1433HP                        | 1.5X.2X20X50X4                                                                      |  |                               |
| 1.5                                 | 0.3                             | 45                                 | 1.50                                 | 3.00                               | 4                                  | 1.44                            | 3.20                                                                                                                                                       | 3.30  | 3.41  | 3.53  | 3.79   | 438118    | 1433HP                        | 1.5X.3X3X45X4                                                                       |  |                               |
| 1.5                                 | 0.3                             | 45                                 | 1.50                                 | 4.00                               | 4                                  | 1.44                            | 4.24                                                                                                                                                       | 4.37  | 4.52  | 4.68  | 5.03   | 438119    | 1433HP                        | 1.5X.3X4X45X4                                                                       |  |                               |
| 1.5                                 | 0.3                             | 45                                 | 1.50                                 | 6.00                               | 4                                  | 1.44                            | 6.30                                                                                                                                                       | 6.51  | 6.74  | 6.98  | 7.52   | 438120    | 1433HP                        | 1.5X.3X6X45X4                                                                       |  |                               |
| 1.5                                 | 0.3                             | 45                                 | 1.50                                 | 8.00                               | 4                                  | 1.44                            | 8.37                                                                                                                                                       | 8.65  | 8.95  | 9.28  | 10.01  | 438121    | 1433HP                        | 1.5X.3X8X45X4                                                                       |  |                               |
| 1.5                                 | 0.3                             | 45                                 | 1.50                                 | 10.00                              | 4                                  | 1.44                            | 10.44                                                                                                                                                      | 10.79 | 11.17 | 11.58 | 12.49  | 438122    | 1433HP                        | 1.5X.3X10X45X4                                                                      |  |                               |
| 1.5                                 | 0.3                             | 45                                 | 1.50                                 | 12.00                              | 4                                  | 1.44                            | 12.50                                                                                                                                                      | 12.93 | 13.39 | 13.88 | 14.98  | 438123    | 1433HP                        | 1.5X.3X12X45X4                                                                      |  |                               |
| 1.5                                 | 0.3                             | 50                                 | 1.50                                 | 16.00                              | 4                                  | 1.44                            | 16.64                                                                                                                                                      | 17.21 | 17.82 | 18.48 | 19.95  | 438124    | 1433HP                        | 1.5X.3X16X50X4                                                                      |  |                               |
| 1.5                                 | 0.3                             | 50                                 | 1.50                                 | 20.00                              | 4                                  | 1.44                            | 20.77                                                                                                                                                      | 21.49 | 22.25 | 23.08 | libero | 438125    | 1433HP                        | 1.5X.3X20X50X4                                                                      |  |                               |
| 1.5                                 | 0.5                             | 45                                 | 1.50                                 | 3.00                               | 4                                  | 1.44                            | 3.19                                                                                                                                                       | 3.29  | 3.39  | 3.50  | 3.74   | 438126    | 1433HP                        | 1.5X.5X3X45X4                                                                       |  |                               |
| 1.5                                 | 0.5                             | 45                                 | 1.50                                 | 4.00                               | 4                                  | 1.44                            | 4.23                                                                                                                                                       | 4.36  | 4.50  | 4.65  | 4.99   | 438127    | 1433HP                        | 1.5X.5X4X45X4                                                                       |  |                               |
| 1.5                                 | 0.5                             | 45                                 | 1.50                                 | 6.00                               | 4                                  | 1.44                            | 6.30                                                                                                                                                       | 6.50  | 6.71  | 6.95  | 7.47   | 437573    | 1433HP                        | 1.5X.5X6X45X4                                                                       |  |                               |
| 1.5                                 | 0.5                             | 45                                 | 1.50                                 | 8.00                               | 4                                  | 1.44                            | 8.36                                                                                                                                                       | 8.64  | 8.93  | 9.25  | 9.96   | 437574    | 1433HP                        | 1.5X.5X8X45X4                                                                       |  |                               |
| 1.5                                 | 0.5                             | 45                                 | 1.50                                 | 10.00                              | 4                                  | 1.44                            | 10.43                                                                                                                                                      | 10.78 | 11.15 | 11.55 | 12.44  | 437575    | 1433HP                        | 1.5X.5X10X45X4                                                                      |  |                               |
| 1.5                                 | 0.5                             | 45                                 | 1.50                                 | 12.00                              | 4                                  | 1.44                            | 12.50                                                                                                                                                      | 12.92 | 13.36 | 13.85 | 14.93  | 438128    | 1433HP                        | 1.5X.5X12X45X4                                                                      |  |                               |
| 1.5                                 | 0.5                             | 50                                 | 1.50                                 | 16.00                              | 4                                  | 1.44                            | 16.63                                                                                                                                                      | 17.19 | 17.80 | 18.45 | 19.90  | 438129    | 1433HP                        | 1.5X.5X16X50X4                                                                      |  |                               |
| 1.5                                 | 0.5                             | 50                                 | 1.50                                 | 20.00                              | 4                                  | 1.44                            | 20.77                                                                                                                                                      | 21.47 | 22.23 | 23.05 | libero | 438130    | 1433HP                        | 1.5X.5X20X50X4                                                                      |  |                               |
| 2                                   | 0.05                            | 45                                 | 1.70                                 | 4.00                               | 4                                  | 1.92                            | 4.28                                                                                                                                                       | 4.43  | 4.59  | 4.76  | 5.14   | 438131    | 1433HP                        | 2X.05X4X45X4                                                                        |  |                               |
| 2                                   | 0.05                            | 45                                 | 1.70                                 | 6.00                               | 4                                  | 1.92                            | 6.35                                                                                                                                                       | 6.57  | 6.80  | 7.06  | 7.63   | 438132    | 1433HP                        | 2X.05X6X45X4                                                                        |  |                               |
| 2                                   | 0.05                            | 45                                 | 1.70                                 | 8.00                               | 4                                  | 1.92                            | 8.42                                                                                                                                                       | 8.71  | 9.02  | 9.36  | 10.11  | 438133    | 1433HP                        | 2X.05X8X45X4                                                                        |  |                               |
| 2                                   | 0.05                            | 45                                 | 1.70                                 | 10.00                              | 4                                  | 1.92                            | 10.48                                                                                                                                                      | 10.85 | 11.24 | 11.66 | 12.60  | 438134    | 1433HP                        | 2X.05X10X45X4                                                                       |  |                               |
| 2                                   | 0.05                            | 45                                 | 1.70                                 | 12.00                              | 4                                  | 1.92                            | 12.55                                                                                                                                                      | 12.99 | 13.45 | 13.96 | 15.09  | 438135    | 1433HP                        | 2X.05X12X45X4                                                                       |  |                               |
| 2                                   | 0.05                            | 50                                 | 1.70                                 | 16.00                              | 4                                  | 1.92                            | 16.69                                                                                                                                                      | 17.27 | 17.89 | 18.56 | libero | 438136    | 1433HP                        | 2X.05X16X50X4                                                                       |  |                               |
| 2                                   | 0.05                            | 50                                 | 1.70                                 | 20.00                              | 4                                  | 1.92                            | 20.82                                                                                                                                                      | 21.54 | 22.32 | 23.16 | libero | 438137    | 1433HP                        | 2X.05X20X50X4                                                                       |  |                               |
| 2                                   | 0.1                             | 45                                 | 1.70                                 | 4.00                               | 4                                  | 1.92                            | 4.28                                                                                                                                                       | 4.43  | 4.58  | 4.75  | 5.13   | 438138    | 1433HP                        | 2X.1X4X45X4                                                                         |  |                               |
| 2                                   | 0.1                             | 45                                 | 1.70                                 | 6.00                               | 4                                  | 1.92                            | 6.35                                                                                                                                                       | 6.57  | 6.80  | 7.05  | 7.62   | 438139    | 1433HP                        | 2X.1X6X45X4                                                                         |  |                               |
| 2                                   | 0.1                             | 45                                 | 1.70                                 | 8.00                               | 4                                  | 1.92                            | 8.42                                                                                                                                                       | 8.71  | 9.02  | 9.35  | 10.10  | 438140    | 1433HP                        | 2X.1X8X45X4                                                                         |  |                               |
| 2                                   | 0.1                             | 45                                 | 1.70                                 | 10.00                              | 4                                  | 1.92                            | 10.48                                                                                                                                                      | 10.84 | 11.23 | 11.65 | 12.59  | 438141    | 1433HP                        | 2X.1X10X45X4                                                                        |  |                               |
| 2                                   | 0.1                             | 45                                 | 1.70                                 | 12.00                              | 4                                  | 1.92                            | 12.55                                                                                                                                                      | 12.98 | 13.45 | 13.95 | 15.07  | 438142    | 1433HP                        | 2X.1X12X45X4                                                                        |  |                               |
| 2                                   | 0.1                             | 50                                 | 1.70                                 | 16.00                              | 4                                  | 1.92                            | 16.68                                                                                                                                                      | 17.26 | 17.88 | 18.55 | libero | 438143    | 1433HP                        | 2X.1X16X50X4                                                                        |  |                               |
| 2                                   | 0.1                             | 50                                 | 1.70                                 | 20.00                              | 4                                  | 1.92                            | 20.82                                                                                                                                                      | 21.54 | 22.32 | 23.15 | libero | 438144    | 1433HP                        | 2X.1X20X50X4                                                                        |  |                               |
| 2                                   | 0.2                             | 45                                 | 1.70                                 | 4.00                               | 4                                  | 1.92                            | 4.28                                                                                                                                                       | 4.42  | 4.57  | 4.74  | 5.10   | 438145    | 1433HP                        | 2X.2X4X45X4                                                                         |  |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

Frese toriche con scarico in metallo duro integrale micrograna.  
Corner radius long neck end mills in solid carbide micro grain.

|                                     |                                 |                                    |                                      |                                    |                                    |                                 |                                                                                                                                                                |       |        |        |        | 1433HP    |                               |                                                                                     |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|--------|--------|-----------|-------------------------------|-------------------------------------------------------------------------------------|-------------------------------|
| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br><br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |        |        |        | ART. NUM. | Codice d'ordine<br>Order code |  | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30'                                                                                                                                                            | 1°    | 1°30'  | 2°     | 3°     |           |                               |                                                                                     | €                             |
| 2                                   | 0.2                             | 45                                 | 1.70                                 | 6.00                               | 4                                  | 1.92                            | 6.34                                                                                                                                                           | 6.56  | 6.79   | 7.04   | 7.59   | 438146    | 1433HP                        | 2X.2X6X45X4                                                                         |                               |
| 2                                   | 0.2                             | 45                                 | 1.70                                 | 8.00                               | 4                                  | 1.92                            | 8.41                                                                                                                                                           | 8.70  | 9.01   | 9.34   | 10.08  | 438147    | 1433HP                        | 2X.2X8X45X4                                                                         |                               |
| 2                                   | 0.2                             | 45                                 | 1.70                                 | 10.00                              | 4                                  | 1.92                            | 10.48                                                                                                                                                          | 10.84 | 11.22  | 11.64  | 12.56  | 438148    | 1433HP                        | 2X.2X10X45X4                                                                        |                               |
| 2                                   | 0.2                             | 45                                 | 1.70                                 | 12.00                              | 4                                  | 1.92                            | 12.55                                                                                                                                                          | 12.98 | 13.44  | 13.93  | 15.05  | 437576    | 1433HP                        | 2X.2X12X45X4                                                                        |                               |
| 2                                   | 0.2                             | 50                                 | 1.70                                 | 16.00                              | 4                                  | 1.92                            | 16.68                                                                                                                                                          | 17.26 | 17.87  | 18.53  | libero | 437577    | 1433HP                        | 2X.2X16X50X4                                                                        |                               |
| 2                                   | 0.2                             | 50                                 | 1.70                                 | 20.00                              | 4                                  | 1.92                            | 20.82                                                                                                                                                          | 21.53 | 22.31  | 23.13  | libero | 437578    | 1433HP                        | 2X.2X20X50X4                                                                        |                               |
| 2                                   | 0.3                             | 45                                 | 1.70                                 | 4.00                               | 4                                  | 1.92                            | 4.27                                                                                                                                                           | 4.41  | 4.56   | 4.72   | 5.08   | 438149    | 1433HP                        | 2X.3X4X45X4                                                                         |                               |
| 2                                   | 0.3                             | 45                                 | 1.70                                 | 6.00                               | 4                                  | 1.92                            | 6.34                                                                                                                                                           | 6.55  | 6.78   | 7.02   | 7.57   | 438150    | 1433HP                        | 2X.3X6X45X4                                                                         |                               |
| 2                                   | 0.3                             | 45                                 | 1.70                                 | 8.00                               | 4                                  | 1.92                            | 8.41                                                                                                                                                           | 8.69  | 8.99   | 9.32   | 10.05  | 438151    | 1433HP                        | 2X.3X8X45X4                                                                         |                               |
| 2                                   | 0.3                             | 45                                 | 1.70                                 | 10.00                              | 4                                  | 1.92                            | 10.48                                                                                                                                                          | 10.83 | 11.21  | 11.62  | 12.54  | 438152    | 1433HP                        | 2X.3X10X45X4                                                                        |                               |
| 2                                   | 0.3                             | 45                                 | 1.70                                 | 12.00                              | 4                                  | 1.92                            | 12.54                                                                                                                                                          | 12.97 | 13.43  | 13.92  | 15.03  | 438153    | 1433HP                        | 2X.3X12X45X4                                                                        |                               |
| 2                                   | 0.3                             | 50                                 | 1.70                                 | 16.00                              | 4                                  | 1.92                            | 16.68                                                                                                                                                          | 17.25 | 17.86  | 18.52  | libero | 438154    | 1433HP                        | 2X.3X16X50X4                                                                        |                               |
| 2                                   | 0.3                             | 50                                 | 1.70                                 | 20.00                              | 4                                  | 1.92                            | 20.81                                                                                                                                                          | 21.53 | 22.29  | 23.12  | libero | 438155    | 1433HP                        | 2X.3X20X50X4                                                                        |                               |
| 2                                   | 0.5                             | 45                                 | 1.70                                 | 4.00                               | 4                                  | 1.92                            | 4.27                                                                                                                                                           | 4.40  | 4.54   | 4.69   | 5.03   | 438156    | 1433HP                        | 2X.5X4X45X4                                                                         |                               |
| 2                                   | 0.5                             | 45                                 | 1.70                                 | 6.00                               | 4                                  | 1.92                            | 6.33                                                                                                                                                           | 6.54  | 6.76   | 6.99   | 7.52   | 438157    | 1433HP                        | 2X.5X6X45X4                                                                         |                               |
| 2                                   | 0.5                             | 45                                 | 1.70                                 | 8.00                               | 4                                  | 1.92                            | 8.40                                                                                                                                                           | 8.68  | 8.97   | 9.29   | 10.00  | 438158    | 1433HP                        | 2X.5X8X45X4                                                                         |                               |
| 2                                   | 0.5                             | 45                                 | 1.70                                 | 10.00                              | 4                                  | 1.92                            | 10.47                                                                                                                                                          | 10.82 | 11.19  | 11.59  | 12.49  | 437579    | 1433HP                        | 2X.5X10X45X4                                                                        |                               |
| 2                                   | 0.5                             | 45                                 | 1.70                                 | 12.00                              | 4                                  | 1.92                            | 12.54                                                                                                                                                          | 12.96 | 13.41  | 13.89  | 14.98  | 437580    | 1433HP                        | 2X.5X12X45X4                                                                        |                               |
| 2                                   | 0.5                             | 50                                 | 1.70                                 | 16.00                              | 4                                  | 1.92                            | 16.67                                                                                                                                                          | 17.23 | 17.84  | 18.49  | libero | 437581    | 1433HP                        | 2X.5X16X50X4                                                                        |                               |
| 2                                   | 0.5                             | 50                                 | 1.70                                 | 20.00                              | 4                                  | 1.92                            | 20.81                                                                                                                                                          | 21.51 | 22.27  | 23.09  | libero | 437582    | 1433HP                        | 2X.5X20X50X4                                                                        |                               |
| 2.5                                 | 0.1                             | 45                                 | 2.00                                 | 10.00                              | 4                                  | 2.39                            | 10.54                                                                                                                                                          | 10.90 | 11.29  | 11.71  | 12.66  | 438159    | 1433HP                        | 2.5X.1X10X45X4                                                                      |                               |
| 2.5                                 | 0.1                             | 50                                 | 2.00                                 | 20.00                              | 4                                  | 2.39                            | 20.88                                                                                                                                                          | 21.60 | 22.38  | libero | libero | 438160    | 1433HP                        | 2.5X.1X20X50X4                                                                      |                               |
| 2.5                                 | 0.1                             | 70                                 | 2.00                                 | 30.00                              | 4                                  | 2.39                            | 31.21                                                                                                                                                          | 32.30 | libero | libero | libero | 438161    | 1433HP                        | 2.5X.1X30X70X4                                                                      |                               |
| 2.5                                 | 0.2                             | 45                                 | 2.00                                 | 10.00                              | 4                                  | 2.39                            | 10.54                                                                                                                                                          | 10.90 | 11.28  | 11.70  | 12.63  | 437583    | 1433HP                        | 2.5X.2X10X45X4                                                                      |                               |
| 2.5                                 | 0.2                             | 50                                 | 2.00                                 | 20.00                              | 4                                  | 2.39                            | 20.87                                                                                                                                                          | 21.59 | 22.37  | libero | libero | 437584    | 1433HP                        | 2.5X.2X20X50X4                                                                      |                               |
| 2.5                                 | 0.2                             | 70                                 | 2.00                                 | 30.00                              | 4                                  | 2.39                            | 31.21                                                                                                                                                          | 32.29 | libero | libero | libero | 438162    | 1433HP                        | 2.5X.2X30X70X4                                                                      |                               |
| 2.5                                 | 0.3                             | 45                                 | 2.00                                 | 10.00                              | 4                                  | 2.39                            | 10.53                                                                                                                                                          | 10.89 | 11.27  | 11.68  | 12.61  | 438163    | 1433HP                        | 2.5X.3X10X45X4                                                                      |                               |
| 2.5                                 | 0.3                             | 50                                 | 2.00                                 | 20.00                              | 4                                  | 2.39                            | 20.87                                                                                                                                                          | 21.59 | 22.36  | libero | libero | 438164    | 1433HP                        | 2.5X.3X20X50X4                                                                      |                               |
| 2.5                                 | 0.3                             | 70                                 | 2.00                                 | 30.00                              | 4                                  | 2.39                            | 31.21                                                                                                                                                          | 32.28 | libero | libero | libero | 438165    | 1433HP                        | 2.5X.3X30X70X4                                                                      |                               |
| 2.5                                 | 0.5                             | 45                                 | 2.00                                 | 10.00                              | 4                                  | 2.39                            | 10.53                                                                                                                                                          | 10.88 | 11.25  | 11.65  | 12.56  | 437585    | 1433HP                        | 2.5X.5X10X45X4                                                                      |                               |
| 2.5                                 | 0.5                             | 50                                 | 2.00                                 | 20.00                              | 4                                  | 2.39                            | 20.86                                                                                                                                                          | 21.57 | 22.33  | libero | libero | 437586    | 1433HP                        | 2.5X.5X20X50X4                                                                      |                               |
| 2.5                                 | 0.5                             | 70                                 | 2.00                                 | 30.00                              | 4                                  | 2.39                            | 31.20                                                                                                                                                          | 32.27 | libero | libero | libero | 438166    | 1433HP                        | 2.5X.5X30X70X4                                                                      |                               |
| 3                                   | 0.05                            | 50                                 | 2.50                                 | 4.00                               | 6                                  | 2.86                            | 4.40                                                                                                                                                           | 4.55  | 4.71   | 4.89   | 5.28   | 438167    | 1433HP                        | 3X.05X4X50X6                                                                        |                               |
| 3                                   | 0.05                            | 50                                 | 2.50                                 | 6.00                               | 6                                  | 2.86                            | 6.47                                                                                                                                                           | 6.69  | 6.93   | 7.19   | 7.77   | 438168    | 1433HP                        | 3X.05X6X50X6                                                                        |                               |
| 3                                   | 0.05                            | 50                                 | 2.50                                 | 8.00                               | 6                                  | 2.86                            | 8.53                                                                                                                                                           | 8.83  | 9.15   | 9.49   | 10.25  | 438169    | 1433HP                        | 3X.05X8X50X6                                                                        |                               |
| 3                                   | 0.05                            | 50                                 | 2.50                                 | 10.00                              | 6                                  | 2.86                            | 10.60                                                                                                                                                          | 10.97 | 11.36  | 11.79  | 12.74  | 438170    | 1433HP                        | 3X.05X10X50X6                                                                       |                               |
| 3                                   | 0.05                            | 50                                 | 2.50                                 | 12.00                              | 6                                  | 2.86                            | 12.67                                                                                                                                                          | 13.11 | 13.58  | 14.09  | 15.23  | 438171    | 1433HP                        | 3X.05X12X50X6                                                                       |                               |
| 3                                   | 0.05                            | 60                                 | 2.50                                 | 16.00                              | 6                                  | 2.86                            | 16.80                                                                                                                                                          | 17.39 | 18.01  | 18.69  | 20.20  | 438172    | 1433HP                        | 3X.05X16X60X6                                                                       |                               |
| 3                                   | 0.05                            | 60                                 | 2.50                                 | 20.00                              | 6                                  | 2.86                            | 20.94                                                                                                                                                          | 21.66 | 22.45  | 23.29  | 25.17  | 438173    | 1433HP                        | 3X.05X20X60X6                                                                       |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

|                                     |                                 |                                    |                                      |                                    |                                    |                                 |                                                                                                                                                            |       |       |       |        | 1433HP    |                               |                                                                                     |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|--------|-----------|-------------------------------|-------------------------------------------------------------------------------------|-------------------------------|
| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |       |       |        | ART. NUM. | Codice d'ordine<br>Order code |  | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30'                                                                                                                                                        | 1°    | 1°30' | 2°    | 3°     |           |                               |                                                                                     | €                             |
| 3                                   | 0.1                             | 50                                 | 2.50                                 | 4.00                               | 6                                  | 2.86                            | 4.40                                                                                                                                                       | 4.55  | 4.71  | 4.88  | 5.27   | 438174    | 1433HP                        | 3X.1X4X50X6                                                                         |                               |
| 3                                   | 0.1                             | 50                                 | 2.50                                 | 6.00                               | 6                                  | 2.86                            | 6.46                                                                                                                                                       | 6.69  | 6.92  | 7.18  | 7.75   | 438175    | 1433HP                        | 3X.1X6X50X6                                                                         |                               |
| 3                                   | 0.1                             | 50                                 | 2.50                                 | 8.00                               | 6                                  | 2.86                            | 8.53                                                                                                                                                       | 8.82  | 9.14  | 9.48  | 10.24  | 438176    | 1433HP                        | 3X.1X8X50X6                                                                         |                               |
| 3                                   | 0.1                             | 50                                 | 2.50                                 | 10.00                              | 6                                  | 2.86                            | 10.60                                                                                                                                                      | 10.96 | 11.36 | 11.78 | 12.73  | 437587    | 1433HP                        | 3X.1X10X50X6                                                                        |                               |
| 3                                   | 0.1                             | 50                                 | 2.50                                 | 12.00                              | 6                                  | 2.86                            | 12.67                                                                                                                                                      | 13.10 | 13.57 | 14.08 | 15.21  | 438177    | 1433HP                        | 3X.1X12X50X6                                                                        |                               |
| 3                                   | 0.1                             | 60                                 | 2.50                                 | 16.00                              | 6                                  | 2.86                            | 16.80                                                                                                                                                      | 17.38 | 18.01 | 18.68 | 20.19  | 438178    | 1433HP                        | 3X.1X16X60X6                                                                        |                               |
| 3                                   | 0.1                             | 60                                 | 2.50                                 | 20.00                              | 6                                  | 2.86                            | 20.93                                                                                                                                                      | 21.66 | 22.44 | 23.28 | 25.16  | 438179    | 1433HP                        | 3X.1X20X60X6                                                                        |                               |
| 3                                   | 0.1                             | 60                                 | 2.50                                 | 25.00                              | 6                                  | 2.86                            | 26.10                                                                                                                                                      | 27.01 | 27.98 | 29.03 | libero | 438180    | 1433HP                        | 3X.1X25X60X6                                                                        |                               |
| 3                                   | 0.1                             | 70                                 | 2.50                                 | 30.00                              | 6                                  | 2.86                            | 31.27                                                                                                                                                      | 32.36 | 33.52 | 34.78 | libero | 438181    | 1433HP                        | 3X.1X30X70X6                                                                        |                               |
| 3                                   | 0.1                             | 70                                 | 2.50                                 | 35.00                              | 6                                  | 2.86                            | 36.44                                                                                                                                                      | 37.71 | 39.06 | 40.53 | libero | 438182    | 1433HP                        | 3X.1X35X70X6                                                                        |                               |
| 3                                   | 0.2                             | 50                                 | 2.50                                 | 4.00                               | 6                                  | 2.86                            | 4.39                                                                                                                                                       | 4.54  | 4.70  | 4.86  | 5.24   | 438183    | 1433HP                        | 3X.2X4X50X6                                                                         |                               |
| 3                                   | 0.2                             | 50                                 | 2.50                                 | 6.00                               | 6                                  | 2.86                            | 6.46                                                                                                                                                       | 6.68  | 6.91  | 7.16  | 7.73   | 438184    | 1433HP                        | 3X.2X6X50X6                                                                         |                               |
| 3                                   | 0.2                             | 50                                 | 2.50                                 | 8.00                               | 6                                  | 2.86                            | 8.53                                                                                                                                                       | 8.82  | 9.13  | 9.46  | 10.22  | 438185    | 1433HP                        | 3X.2X8X50X6                                                                         |                               |
| 3                                   | 0.2                             | 50                                 | 2.50                                 | 10.00                              | 6                                  | 2.86                            | 10.59                                                                                                                                                      | 10.96 | 11.35 | 11.76 | 12.70  | 437588    | 1433HP                        | 3X.2X10X50X6                                                                        |                               |
| 3                                   | 0.2                             | 50                                 | 2.50                                 | 12.00                              | 6                                  | 2.86                            | 12.66                                                                                                                                                      | 13.10 | 13.56 | 14.06 | 15.19  | 438186    | 1433HP                        | 3X.2X12X50X6                                                                        |                               |
| 3                                   | 0.2                             | 60                                 | 2.50                                 | 16.00                              | 6                                  | 2.86                            | 16.80                                                                                                                                                      | 17.38 | 18.00 | 18.66 | 20.16  | 437589    | 1433HP                        | 3X.2X16X60X6                                                                        |                               |
| 3                                   | 0.2                             | 60                                 | 2.50                                 | 20.00                              | 6                                  | 2.86                            | 20.93                                                                                                                                                      | 21.65 | 22.43 | 23.26 | 25.13  | 438187    | 1433HP                        | 3X.2X20X60X6                                                                        |                               |
| 3                                   | 0.2                             | 60                                 | 2.50                                 | 25.00                              | 6                                  | 2.86                            | 26.10                                                                                                                                                      | 27.00 | 27.97 | 29.01 | libero | 438188    | 1433HP                        | 3X.2X25X60X6                                                                        |                               |
| 3                                   | 0.2                             | 70                                 | 2.50                                 | 30.00                              | 6                                  | 2.86                            | 31.27                                                                                                                                                      | 32.35 | 33.51 | 34.76 | libero | 438189    | 1433HP                        | 3X.2X30X70X6                                                                        |                               |
| 3                                   | 0.2                             | 70                                 | 2.50                                 | 35.00                              | 6                                  | 2.86                            | 36.44                                                                                                                                                      | 37.70 | 39.05 | 40.51 | libero | 438190    | 1433HP                        | 3X.2X35X70X6                                                                        |                               |
| 3                                   | 0.3                             | 50                                 | 2.50                                 | 4.00                               | 6                                  | 2.86                            | 4.39                                                                                                                                                       | 4.53  | 4.69  | 4.85  | 5.22   | 438191    | 1433HP                        | 3X.3X4X50X6                                                                         |                               |
| 3                                   | 0.3                             | 50                                 | 2.50                                 | 6.00                               | 6                                  | 2.86                            | 6.46                                                                                                                                                       | 6.67  | 6.90  | 7.15  | 7.71   | 438192    | 1433HP                        | 3X.3X6X50X6                                                                         |                               |
| 3                                   | 0.3                             | 50                                 | 2.50                                 | 8.00                               | 6                                  | 2.86                            | 8.52                                                                                                                                                       | 8.81  | 9.12  | 9.45  | 10.19  | 438193    | 1433HP                        | 3X.3X8X50X6                                                                         |                               |
| 3                                   | 0.3                             | 50                                 | 2.50                                 | 10.00                              | 6                                  | 2.86                            | 10.59                                                                                                                                                      | 10.95 | 11.34 | 11.75 | 12.68  | 438194    | 1433HP                        | 3X.3X10X50X6                                                                        |                               |
| 3                                   | 0.3                             | 50                                 | 2.50                                 | 12.00                              | 6                                  | 2.86                            | 12.66                                                                                                                                                      | 13.09 | 13.55 | 14.05 | 15.16  | 438195    | 1433HP                        | 3X.3X12X50X6                                                                        |                               |
| 3                                   | 0.3                             | 60                                 | 2.50                                 | 16.00                              | 6                                  | 2.86                            | 16.79                                                                                                                                                      | 17.37 | 17.99 | 18.65 | 20.14  | 438196    | 1433HP                        | 3X.3X16X60X6                                                                        |                               |
| 3                                   | 0.3                             | 60                                 | 2.50                                 | 20.00                              | 6                                  | 2.86                            | 20.93                                                                                                                                                      | 21.65 | 22.42 | 23.25 | 25.11  | 438197    | 1433HP                        | 3X.3X20X60X6                                                                        |                               |
| 3                                   | 0.3                             | 60                                 | 2.50                                 | 25.00                              | 6                                  | 2.86                            | 26.10                                                                                                                                                      | 27.00 | 27.96 | 29.00 | libero | 438198    | 1433HP                        | 3X.3X25X60X6                                                                        |                               |
| 3                                   | 0.3                             | 70                                 | 2.50                                 | 30.00                              | 6                                  | 2.86                            | 31.26                                                                                                                                                      | 32.34 | 33.50 | 34.75 | libero | 438199    | 1433HP                        | 3X.3X30X70X6                                                                        |                               |
| 3                                   | 0.3                             | 70                                 | 2.50                                 | 35.00                              | 6                                  | 2.86                            | 36.43                                                                                                                                                      | 37.69 | 39.04 | 40.50 | libero | 438200    | 1433HP                        | 3X.3X35X70X6                                                                        |                               |
| 3                                   | 0.5                             | 50                                 | 2.50                                 | 4.00                               | 6                                  | 2.86                            | 4.38                                                                                                                                                       | 4.52  | 4.66  | 4.82  | 5.17   | 438201    | 1433HP                        | 3X.5X4X50X6                                                                         |                               |
| 3                                   | 0.5                             | 50                                 | 2.50                                 | 6.00                               | 6                                  | 2.86                            | 6.45                                                                                                                                                       | 6.66  | 6.88  | 7.12  | 7.66   | 438202    | 1433HP                        | 3X.5X6X50X6                                                                         |                               |
| 3                                   | 0.5                             | 50                                 | 2.50                                 | 8.00                               | 6                                  | 2.86                            | 8.52                                                                                                                                                       | 8.80  | 9.10  | 9.42  | 10.14  | 438203    | 1433HP                        | 3X.5X8X50X6                                                                         |                               |
| 3                                   | 0.5                             | 50                                 | 2.50                                 | 10.00                              | 6                                  | 2.86                            | 10.58                                                                                                                                                      | 10.94 | 11.31 | 11.72 | 12.63  | 437590    | 1433HP                        | 3X.5X10X50X6                                                                        |                               |
| 3                                   | 0.5                             | 50                                 | 2.50                                 | 12.00                              | 6                                  | 2.86                            | 12.65                                                                                                                                                      | 13.08 | 13.53 | 14.02 | 15.12  | 438204    | 1433HP                        | 3X.5X12X50X6                                                                        |                               |
| 3                                   | 0.5                             | 60                                 | 2.50                                 | 16.00                              | 6                                  | 2.86                            | 16.79                                                                                                                                                      | 17.35 | 17.96 | 18.62 | 20.09  | 437591    | 1433HP                        | 3X.5X16X60X6                                                                        |                               |
| 3                                   | 0.5                             | 60                                 | 2.50                                 | 20.00                              | 6                                  | 2.86                            | 20.92                                                                                                                                                      | 21.63 | 22.40 | 23.22 | 25.06  | 437592    | 1433HP                        | 3X.5X20X60X6                                                                        |                               |
| 3                                   | 0.5                             | 60                                 | 2.50                                 | 25.00                              | 6                                  | 2.86                            | 26.09                                                                                                                                                      | 26.98 | 27.94 | 28.97 | libero | 438205    | 1433HP                        | 3X.5X25X60X6                                                                        |                               |
| 3                                   | 0.5                             | 70                                 | 2.50                                 | 30.00                              | 6                                  | 2.86                            | 31.26                                                                                                                                                      | 32.33 | 33.48 | 34.72 | libero | 438206    | 1433HP                        | 3X.5X30X70X6                                                                        |                               |

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Frese toriche con scarico in metallo duro integrale micrograna.  
Corner radius long neck end mills in solid carbide micro grain.

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |        |        |        | 1433HP    |                               |              | Prezzo utensile<br>Tool Price |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|--------|--------|-----------|-------------------------------|--------------|-------------------------------|
|                                     |                                 |                                    |                                      |                                    |                                    |                                 | 30°                                                                                                                                                        | 1°    | 1°30'  | 2°     | 3°     | ART. NUM. | Codice d'ordine<br>Order code |              |                               |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  |                                                                                                                                                            |       |        |        |        |           |                               |              | €                             |
| 3                                   | 0.5                             | 70                                 | 2.50                                 | 35.00                              | 6                                  | 2.86                            | 36.43                                                                                                                                                      | 37.68 | 39.02  | 40.47  | libero | 438207    | 1433HP                        | 3X.5X35X70X6 |                               |
| 3                                   | 1.0                             | 50                                 | 2.50                                 | 8.00                               | 6                                  | 2.86                            | 8.50                                                                                                                                                       | 8.76  | 9.04   | 9.34   | 10.02  | 438208    | 1433HP                        | 3X1X8X50X6   |                               |
| 3                                   | 1.0                             | 50                                 | 2.50                                 | 10.00                              | 6                                  | 2.86                            | 10.57                                                                                                                                                      | 10.90 | 11.26  | 11.64  | 12.51  | 438209    | 1433HP                        | 3X1X10X50X6  |                               |
| 3                                   | 1.0                             | 50                                 | 2.50                                 | 12.00                              | 6                                  | 2.86                            | 12.64                                                                                                                                                      | 13.04 | 13.48  | 13.94  | 14.99  | 438210    | 1433HP                        | 3X1X12X50X6  |                               |
| 3                                   | 1.0                             | 60                                 | 2.50                                 | 16.00                              | 6                                  | 2.86                            | 16.77                                                                                                                                                      | 17.32 | 17.91  | 18.54  | 19.97  | 438211    | 1433HP                        | 3X1X16X60X6  |                               |
| 3                                   | 1.0                             | 60                                 | 2.50                                 | 20.00                              | 6                                  | 2.86                            | 20.90                                                                                                                                                      | 21.60 | 22.34  | 23.14  | 24.94  | 437593    | 1433HP                        | 3X1X20X60X6  |                               |
| 3                                   | 1.0                             | 60                                 | 2.50                                 | 25.00                              | 6                                  | 2.86                            | 26.07                                                                                                                                                      | 26.95 | 27.88  | 28.89  | libero | 438212    | 1433HP                        | 3X1X25X60X6  |                               |
| 3                                   | 1.0                             | 70                                 | 2.50                                 | 30.00                              | 6                                  | 2.86                            | 31.24                                                                                                                                                      | 32.30 | 33.43  | 34.64  | libero | 438213    | 1433HP                        | 3X1X30X70X6  |                               |
| 3                                   | 1.0                             | 70                                 | 2.50                                 | 35.00                              | 6                                  | 2.86                            | 36.41                                                                                                                                                      | 37.64 | 38.97  | 40.39  | libero | 438214    | 1433HP                        | 3X1X35X70X6  |                               |
| 4                                   | 0.1                             | 50                                 | 3.50                                 | 8.00                               | 6                                  | 3.80                            | 8.65                                                                                                                                                       | 8.94  | 9.26   | 9.61   | 10.38  | 438216    | 1433HP                        | 4X.1X8X50X6  |                               |
| 4                                   | 0.1                             | 50                                 | 3.50                                 | 10.00                              | 6                                  | 3.80                            | 10.71                                                                                                                                                      | 11.08 | 11.48  | 11.91  | 12.87  | 438217    | 1433HP                        | 4X.1X10X50X6 |                               |
| 4                                   | 0.1                             | 50                                 | 3.50                                 | 12.00                              | 6                                  | 3.80                            | 12.78                                                                                                                                                      | 13.22 | 13.70  | 14.21  | 15.35  | 438218    | 1433HP                        | 4X.1X12X50X6 |                               |
| 4                                   | 0.1                             | 60                                 | 3.50                                 | 16.00                              | 6                                  | 3.80                            | 16.92                                                                                                                                                      | 17.50 | 18.13  | 18.81  | libero | 438219    | 1433HP                        | 4X.1X16X60X6 |                               |
| 4                                   | 0.1                             | 60                                 | 3.50                                 | 20.00                              | 6                                  | 3.80                            | 21.05                                                                                                                                                      | 21.78 | 22.56  | 23.41  | libero | 438220    | 1433HP                        | 4X.1X20X60X6 |                               |
| 4                                   | 0.1                             | 60                                 | 3.50                                 | 25.00                              | 6                                  | 3.80                            | 26.22                                                                                                                                                      | 27.13 | 28.11  | libero | libero | 438221    | 1433HP                        | 4X.1X25X60X6 |                               |
| 4                                   | 0.1                             | 70                                 | 3.50                                 | 30.00                              | 6                                  | 3.80                            | 31.39                                                                                                                                                      | 32.48 | 33.65  | libero | libero | 438222    | 1433HP                        | 4X.1X30X70X6 |                               |
| 4                                   | 0.1                             | 80                                 | 3.50                                 | 40.00                              | 6                                  | 3.80                            | 41.72                                                                                                                                                      | 43.17 | libero | libero | libero | 438223    | 1433HP                        | 4X.1X40X80X6 |                               |
| 4                                   | 0.2                             | 50                                 | 3.50                                 | 8.00                               | 6                                  | 3.80                            | 8.64                                                                                                                                                       | 8.94  | 9.25   | 9.59   | 10.36  | 438224    | 1433HP                        | 4X.2X8X50X6  |                               |
| 4                                   | 0.2                             | 50                                 | 3.50                                 | 10.00                              | 6                                  | 3.80                            | 10.71                                                                                                                                                      | 11.08 | 11.47  | 11.89  | 12.84  | 438225    | 1433HP                        | 4X.2X10X50X6 |                               |
| 4                                   | 0.2                             | 50                                 | 3.50                                 | 12.00                              | 6                                  | 3.80                            | 12.78                                                                                                                                                      | 13.22 | 13.69  | 14.19  | 15.33  | 438226    | 1433HP                        | 4X.2X12X50X6 |                               |
| 4                                   | 0.2                             | 60                                 | 3.50                                 | 16.00                              | 6                                  | 3.80                            | 16.91                                                                                                                                                      | 17.50 | 18.12  | 18.79  | libero | 437594    | 1433HP                        | 4X.2X16X60X6 |                               |
| 4                                   | 0.2                             | 60                                 | 3.50                                 | 20.00                              | 6                                  | 3.80                            | 21.05                                                                                                                                                      | 21.77 | 22.55  | 23.39  | libero | 437596    | 1433HP                        | 4X.2X20X60X6 |                               |
| 4                                   | 0.2                             | 60                                 | 3.50                                 | 25.00                              | 6                                  | 3.80                            | 26.22                                                                                                                                                      | 27.12 | 28.09  | libero | libero | 438227    | 1433HP                        | 4X.2X25X60X6 |                               |
| 4                                   | 0.2                             | 70                                 | 3.50                                 | 30.00                              | 6                                  | 3.80                            | 31.38                                                                                                                                                      | 32.47 | 33.64  | libero | libero | 438228    | 1433HP                        | 4X.2X30X70X6 |                               |
| 4                                   | 0.2                             | 80                                 | 3.50                                 | 40.00                              | 6                                  | 3.80                            | 41.72                                                                                                                                                      | 43.17 | libero | libero | libero | 438229    | 1433HP                        | 4X.2X40X80X6 |                               |
| 4                                   | 0.3                             | 50                                 | 3.50                                 | 8.00                               | 6                                  | 3.80                            | 8.64                                                                                                                                                       | 8.93  | 9.24   | 9.58   | 10.33  | 438230    | 1433HP                        | 4X.3X8X50X6  |                               |
| 4                                   | 0.3                             | 50                                 | 3.50                                 | 10.00                              | 6                                  | 3.80                            | 10.71                                                                                                                                                      | 11.07 | 11.46  | 11.88  | 12.82  | 438231    | 1433HP                        | 4X.3X10X50X6 |                               |
| 4                                   | 0.3                             | 50                                 | 3.50                                 | 12.00                              | 6                                  | 3.80                            | 12.77                                                                                                                                                      | 13.21 | 13.68  | 14.18  | 15.30  | 438232    | 1433HP                        | 4X.3X12X50X6 |                               |
| 4                                   | 0.3                             | 60                                 | 3.50                                 | 16.00                              | 6                                  | 3.80                            | 16.91                                                                                                                                                      | 17.49 | 18.11  | 18.78  | libero | 438233    | 1433HP                        | 4X.3X16X60X6 |                               |
| 4                                   | 0.3                             | 60                                 | 3.50                                 | 20.00                              | 6                                  | 3.80                            | 21.04                                                                                                                                                      | 21.77 | 22.54  | 23.38  | libero | 438234    | 1433HP                        | 4X.3X20X60X6 |                               |
| 4                                   | 0.3                             | 60                                 | 3.50                                 | 25.00                              | 6                                  | 3.80                            | 26.21                                                                                                                                                      | 27.12 | 28.08  | libero | libero | 438235    | 1433HP                        | 4X.3X25X60X6 |                               |
| 4                                   | 0.3                             | 70                                 | 3.50                                 | 30.00                              | 6                                  | 3.80                            | 31.38                                                                                                                                                      | 32.46 | 33.63  | libero | libero | 438236    | 1433HP                        | 4X.3X30X70X6 |                               |
| 4                                   | 0.3                             | 80                                 | 3.50                                 | 40.00                              | 6                                  | 3.80                            | 41.72                                                                                                                                                      | 43.16 | libero | libero | libero | 438237    | 1433HP                        | 4X.3X40X80X6 |                               |
| 4                                   | 0.5                             | 50                                 | 3.50                                 | 8.00                               | 6                                  | 3.80                            | 8.63                                                                                                                                                       | 8.92  | 9.22   | 9.55   | 10.28  | 438238    | 1433HP                        | 4X.5X8X50X6  |                               |
| 4                                   | 0.5                             | 50                                 | 3.50                                 | 10.00                              | 6                                  | 3.80                            | 10.70                                                                                                                                                      | 11.06 | 11.44  | 11.85  | 12.77  | 438239    | 1433HP                        | 4X.5X10X50X6 |                               |
| 4                                   | 0.5                             | 50                                 | 3.50                                 | 12.00                              | 6                                  | 3.80                            | 12.77                                                                                                                                                      | 13.20 | 13.65  | 14.15  | 15.26  | 437597    | 1433HP                        | 4X.5X12X50X6 |                               |
| 4                                   | 0.5                             | 60                                 | 3.50                                 | 16.00                              | 6                                  | 3.80                            | 16.90                                                                                                                                                      | 17.47 | 18.09  | 18.75  | libero | 437598    | 1433HP                        | 4X.5X16X60X6 |                               |
| 4                                   | 0.5                             | 60                                 | 3.50                                 | 20.00                              | 6                                  | 3.80                            | 21.04                                                                                                                                                      | 21.75 | 22.52  | 23.35  | libero | 437599    | 1433HP                        | 4X.5X20X60X6 |                               |
| 4                                   | 0.5                             | 60                                 | 3.50                                 | 25.00                              | 6                                  | 3.80                            | 26.21                                                                                                                                                      | 27.10 | 28.06  | 29.10  | libero | 438240    | 1433HP                        | 4X.5X25X60X6 |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |        |        |        |        |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--------|--------|
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30°                                                                                                                                                        | 1°     | 1°30'  | 2°     | 3°     |
| 4                                   | 0.5                             | 70                                 | 3.50                                 | 30.00                              | 6                                  | 3.80                            | 31.37                                                                                                                                                      | 32.45  | 33.60  | libero | libero |
| 4                                   | 0.5                             | 80                                 | 3.50                                 | 40.00                              | 6                                  | 3.80                            | 41.71                                                                                                                                                      | 43.15  | libero | libero | libero |
| 4                                   | 1.0                             | 50                                 | 3.50                                 | 8.00                               | 6                                  | 3.80                            | 8.62                                                                                                                                                       | 8.88   | 9.17   | 9.47   | 10.16  |
| 4                                   | 1.0                             | 50                                 | 3.50                                 | 10.00                              | 6                                  | 3.80                            | 10.68                                                                                                                                                      | 11.02  | 11.38  | 11.77  | 12.65  |
| 4                                   | 1.0                             | 50                                 | 3.50                                 | 12.00                              | 6                                  | 3.80                            | 12.75                                                                                                                                                      | 13.16  | 13.60  | 14.07  | 15.13  |
| 4                                   | 1.0                             | 60                                 | 3.50                                 | 16.00                              | 6                                  | 3.80                            | 16.89                                                                                                                                                      | 17.44  | 18.03  | 18.67  | libero |
| 4                                   | 1.0                             | 60                                 | 3.50                                 | 20.00                              | 6                                  | 3.80                            | 21.02                                                                                                                                                      | 21.72  | 22.47  | 23.27  | libero |
| 4                                   | 1.0                             | 60                                 | 3.50                                 | 25.00                              | 6                                  | 3.80                            | 26.19                                                                                                                                                      | 27.07  | 28.01  | 29.02  | libero |
| 4                                   | 1.0                             | 70                                 | 3.50                                 | 30.00                              | 6                                  | 3.80                            | 31.36                                                                                                                                                      | 32.42  | 33.55  | libero | libero |
| 4                                   | 1.0                             | 80                                 | 3.50                                 | 40.00                              | 6                                  | 3.80                            | 41.69                                                                                                                                                      | 43.11  | libero | libero | libero |
| 5                                   | 0.1                             | 60                                 | 4.00                                 | 20.00                              | 6                                  | 4.75                            | 21.15                                                                                                                                                      | 21.88  | libero | libero | libero |
| 5                                   | 0.1                             | 80                                 | 4.00                                 | 40.00                              | 6                                  | 4.75                            | 41.82                                                                                                                                                      | libero | libero | libero | libero |
| 5                                   | 0.2                             | 60                                 | 4.00                                 | 20.00                              | 6                                  | 4.75                            | 21.14                                                                                                                                                      | 21.87  | libero | libero | libero |
| 5                                   | 0.2                             | 80                                 | 4.00                                 | 40.00                              | 6                                  | 4.75                            | 41.82                                                                                                                                                      | libero | libero | libero | libero |
| 5                                   | 0.3                             | 60                                 | 4.00                                 | 20.00                              | 6                                  | 4.75                            | 21.14                                                                                                                                                      | 21.87  | libero | libero | libero |
| 5                                   | 0.3                             | 80                                 | 4.00                                 | 40.00                              | 6                                  | 4.75                            | 41.81                                                                                                                                                      | libero | libero | libero | libero |
| 5                                   | 0.5                             | 60                                 | 4.00                                 | 20.00                              | 6                                  | 4.75                            | 21.13                                                                                                                                                      | 21.85  | libero | libero | libero |
| 5                                   | 0.5                             | 80                                 | 4.00                                 | 40.00                              | 6                                  | 4.75                            | 41.81                                                                                                                                                      | libero | libero | libero | libero |
| 5                                   | 1.0                             | 60                                 | 4.00                                 | 20.00                              | 6                                  | 4.75                            | 21.12                                                                                                                                                      | 21.82  | libero | libero | libero |
| 5                                   | 1.0                             | 80                                 | 4.00                                 | 40.00                              | 6                                  | 4.75                            | 41.79                                                                                                                                                      | libero | libero | libero | libero |
| 6                                   | 0.1                             | 50                                 | 5.00                                 | 12.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero |
| 6                                   | 0.1                             | 60                                 | 5.00                                 | 16.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero |
| 6                                   | 0.1                             | 60                                 | 5.00                                 | 20.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero |
| 6                                   | 0.1                             | 70                                 | 5.00                                 | 30.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero |
| 6                                   | 0.2                             | 50                                 | 5.00                                 | 12.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero |
| 6                                   | 0.2                             | 60                                 | 5.00                                 | 16.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero |
| 6                                   | 0.2                             | 60                                 | 5.00                                 | 20.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero |
| 6                                   | 0.2                             | 70                                 | 5.00                                 | 30.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero |
| 6                                   | 0.3                             | 50                                 | 5.00                                 | 12.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero |
| 6                                   | 0.3                             | 60                                 | 5.00                                 | 16.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero |
| 6                                   | 0.3                             | 60                                 | 5.00                                 | 20.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero |
| 6                                   | 0.3                             | 70                                 | 5.00                                 | 30.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero |
| 6                                   | 0.5                             | 50                                 | 5.00                                 | 12.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero |
| 6                                   | 0.5                             | 60                                 | 5.00                                 | 16.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero |
| 6                                   | 0.5                             | 60                                 | 5.00                                 | 20.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero |
| 6                                   | 0.5                             | 70                                 | 5.00                                 | 30.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero |
| 6                                   | 1.0                             | 50                                 | 5.00                                 | 12.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero |
| 6                                   | 1.0                             | 60                                 | 5.00                                 | 16.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero |
| 6                                   | 1.0                             | 60                                 | 5.00                                 | 20.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero |

| 1433HP    |                               |                                                                                     |                               |
|-----------|-------------------------------|-------------------------------------------------------------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code |  | Prezzo utensile<br>Tool Price |
|           |                               |                                                                                     | €                             |
| 438241    | 1433HP                        | 4X.5X30X70X6                                                                        |                               |
| 438242    | 1433HP                        | 4X.5X40X80X6                                                                        |                               |
| 438215    | 1433HP                        | 4X1X8X50X6                                                                          |                               |
| 438243    | 1433HP                        | 4X1X10X50X6                                                                         |                               |
| 438244    | 1433HP                        | 4X1X12X50X6                                                                         |                               |
| 438245    | 1433HP                        | 4X1X16X60X6                                                                         |                               |
| 438246    | 1433HP                        | 4X1X20X60X6                                                                         |                               |
| 438247    | 1433HP                        | 4X1X25X60X6                                                                         |                               |
| 438248    | 1433HP                        | 4X1X30X70X6                                                                         |                               |
| 438249    | 1433HP                        | 4X1X40X80X6                                                                         |                               |
| 438250    | 1433HP                        | 5X.1X20X60X6                                                                        |                               |
| 438251    | 1433HP                        | 5X.1X40X80X6                                                                        |                               |
| 437600    | 1433HP                        | 5X.2X20X60X6                                                                        |                               |
| 438252    | 1433HP                        | 5X.2X40X80X6                                                                        |                               |
| 438253    | 1433HP                        | 5X.3X20X60X6                                                                        |                               |
| 438254    | 1433HP                        | 5X.3X40X80X6                                                                        |                               |
| 437601    | 1433HP                        | 5X.5X20X60X6                                                                        |                               |
| 438255    | 1433HP                        | 5X.5X40X80X6                                                                        |                               |
| 438256    | 1433HP                        | 5X1X20X60X6                                                                         |                               |
| 438257    | 1433HP                        | 5X1X40X80X6                                                                         |                               |
| 438258    | 1433HP                        | 6X.1X12X50X6                                                                        |                               |
| 438259    | 1433HP                        | 6X.1X16X60X6                                                                        |                               |
| 438260    | 1433HP                        | 6X.1X20X60X6                                                                        |                               |
| 438261    | 1433HP                        | 6X.1X30X70X6                                                                        |                               |
| 438262    | 1433HP                        | 6X.2X12X50X6                                                                        |                               |
| 438263    | 1433HP                        | 6X.2X16X60X6                                                                        |                               |
| 437602    | 1433HP                        | 6X.2X20X60X6                                                                        |                               |
| 438264    | 1433HP                        | 6X.2X30X70X6                                                                        |                               |
| 438265    | 1433HP                        | 6X.3X12X50X6                                                                        |                               |
| 438266    | 1433HP                        | 6X.3X16X60X6                                                                        |                               |
| 437603    | 1433HP                        | 6X.3X20X60X6                                                                        |                               |
| 438267    | 1433HP                        | 6X.3X30X70X6                                                                        |                               |
| 438268    | 1433HP                        | 6X.5X12X50X6                                                                        |                               |
| 438269    | 1433HP                        | 6X.5X16X60X6                                                                        |                               |
| 437604    | 1433HP                        | 6X.5X20X60X6                                                                        |                               |
| 438270    | 1433HP                        | 6X.5X30X70X6                                                                        |                               |
| 438271    | 1433HP                        | 6X1X12X50X6                                                                         |                               |
| 438272    | 1433HP                        | 6X1X16X60X6                                                                         |                               |
| 437605    | 1433HP                        | 6X1X20X60X6                                                                         |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

**Frese toriche con scarico in metallo duro integrale micrograna.**  
 Corner radius long neck end mills in solid carbide micro grain.

| 1433HP                              |                                 |                                    |                                      |                                    |                                    |                                 |                                                                                                                                                            |        |        |        |        |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--------|--------|
| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |        |        |        |        |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30°                                                                                                                                                        | 1°     | 1°30'  | 2°     | 3°     |
| 6                                   | 1.0                             | 70                                 | 5.00                                 | 30.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero |
| 6                                   | 1.5                             | 60                                 | 5.00                                 | 20.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero |
| 6                                   | 1.5                             | 70                                 | 5.00                                 | 30.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero |
| 8                                   | 0.2                             | 65                                 | 8.00                                 | 24.00                              | 8                                  | 7.60                            | libero                                                                                                                                                     | libero | libero | libero | libero |
| 8                                   | 0.3                             | 65                                 | 8.00                                 | 24.00                              | 8                                  | 7.60                            | libero                                                                                                                                                     | libero | libero | libero | libero |
| 8                                   | 0.5                             | 65                                 | 8.00                                 | 24.00                              | 8                                  | 7.60                            | libero                                                                                                                                                     | libero | libero | libero | libero |
| 8                                   | 1.0                             | 65                                 | 8.00                                 | 24.00                              | 8                                  | 7.60                            | libero                                                                                                                                                     | libero | libero | libero | libero |
| 8                                   | 1.5                             | 65                                 | 8.00                                 | 24.00                              | 8                                  | 7.60                            | libero                                                                                                                                                     | libero | libero | libero | libero |
| 10                                  | 0.5                             | 70                                 | 10.00                                | 25.00                              | 10                                 | 9.50                            | libero                                                                                                                                                     | libero | libero | libero | libero |
| 10                                  | 1.0                             | 70                                 | 10.00                                | 25.00                              | 10                                 | 9.50                            | libero                                                                                                                                                     | libero | libero | libero | libero |
| 12                                  | 0.5                             | 80                                 | 12.00                                | 25.00                              | 12                                 | 11.50                           | libero                                                                                                                                                     | libero | libero | libero | libero |
| 12                                  | 1.0                             | 80                                 | 12.00                                | 25.00                              | 12                                 | 11.50                           | libero                                                                                                                                                     | libero | libero | libero | libero |

| ART. NUM. | Codice d'ordine<br>Order code | HA<br>6535     | Prezzo utensile<br>Tool Price |
|-----------|-------------------------------|----------------|-------------------------------|
| 438273    | 1433HP                        | 6X1X30X70X6    | €                             |
| 438274    | 1433HP                        | 6X1.5X20X60X6  | €                             |
| 438275    | 1433HP                        | 6X1.5X30X70X6  | €                             |
| 438276    | 1433HP                        | 8X.2X24X65X8   | €                             |
| 438277    | 1433HP                        | 8X.3X24X65X8   | €                             |
| 438278    | 1433HP                        | 8X.5X24X65X8   | €                             |
| 438279    | 1433HP                        | 8X1X24X65X8    | €                             |
| 438280    | 1433HP                        | 8X1.5X24X65X8  | €                             |
| 438281    | 1433HP                        | 10X.5X25X70X10 | €                             |
| 438282    | 1433HP                        | 10X1X10X70X10  | €                             |
| 438283    | 1433HP                        | 12X.5X12X80X12 | €                             |
| 438284    | 1433HP                        | 12X1X12X80X12  | €                             |

**Frese toriche con scarico in metallo duro integrale micrograna.**  
Corner radius end mills long neck in solid carbide micro grain.

|  |  |   |  |   |
|--|--|---|--|---|
|  |  |   |  | - |
|  |  | - |  |   |

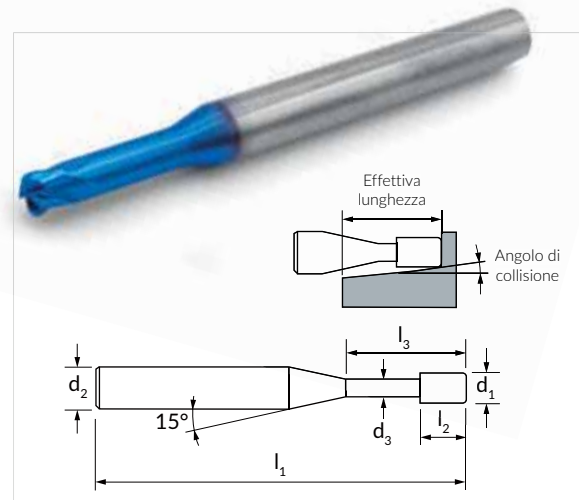
## Operazioni di fresatura | Milling strategies:



## Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |   |
|---|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | ● | ● |
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |

● Raccomandato - Most suitable  
○ Possibile - Possible



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø          | Raggio   Radius |
|----------------------------------|-----------------|
| d ≤ 6: 0/-0.01   d > 6: 0/-0.015 | ±0.01           |

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |       |       |       |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30°                                                                                                                                                        | 1°    | 1°30' | 2°    | 3°    |
| 1                                   | 0.05                            | 45                                 | 0.80                                 | 4.00                               | 4                                  | 0.95                            | 4.22                                                                                                                                                       | 4.37  | 4.53  | 4.69  | 5.07  |
| 1                                   | 0.05                            | 45                                 | 0.80                                 | 5.00                               | 4                                  | 0.95                            | 5.26                                                                                                                                                       | 5.44  | 5.63  | 5.84  | 6.31  |
| 1                                   | 0.05                            | 45                                 | 0.80                                 | 6.00                               | 4                                  | 0.95                            | 6.29                                                                                                                                                       | 6.51  | 6.74  | 6.99  | 7.56  |
| 1                                   | 0.05                            | 45                                 | 0.80                                 | 8.00                               | 4                                  | 0.95                            | 8.36                                                                                                                                                       | 8.65  | 8.96  | 9.29  | 10.04 |
| 1                                   | 0.05                            | 45                                 | 0.80                                 | 10.00                              | 4                                  | 0.95                            | 10.43                                                                                                                                                      | 10.79 | 11.18 | 11.59 | 12.53 |
| 1                                   | 0.05                            | 45                                 | 0.80                                 | 12.00                              | 4                                  | 0.95                            | 12.49                                                                                                                                                      | 12.93 | 13.39 | 13.89 | 15.02 |
| 1                                   | 0.05                            | 50                                 | 0.80                                 | 16.00                              | 4                                  | 0.95                            | 16.63                                                                                                                                                      | 17.21 | 17.83 | 18.49 | 19.99 |
| 1                                   | 0.1                             | 45                                 | 0.80                                 | 4.00                               | 4                                  | 0.95                            | 4.22                                                                                                                                                       | 4.37  | 4.52  | 4.69  | 5.06  |
| 1                                   | 0.1                             | 45                                 | 0.80                                 | 5.00                               | 4                                  | 0.95                            | 5.26                                                                                                                                                       | 5.44  | 5.63  | 5.84  | 6.30  |
| 1                                   | 0.1                             | 45                                 | 0.80                                 | 6.00                               | 4                                  | 0.95                            | 6.29                                                                                                                                                       | 6.51  | 6.74  | 6.99  | 7.55  |
| 1                                   | 0.1                             | 45                                 | 0.80                                 | 8.00                               | 4                                  | 0.95                            | 8.36                                                                                                                                                       | 8.65  | 8.95  | 9.29  | 10.03 |
| 1                                   | 0.1                             | 45                                 | 0.80                                 | 10.00                              | 4                                  | 0.95                            | 10.42                                                                                                                                                      | 10.78 | 11.17 | 11.59 | 12.52 |
| 1                                   | 0.1                             | 45                                 | 0.80                                 | 12.00                              | 4                                  | 0.95                            | 12.49                                                                                                                                                      | 12.92 | 13.39 | 13.89 | 15.00 |
| 1                                   | 0.1                             | 50                                 | 0.80                                 | 16.00                              | 4                                  | 0.95                            | 16.63                                                                                                                                                      | 17.20 | 17.82 | 18.48 | 19.98 |
| 1                                   | 0.2                             | 45                                 | 0.80                                 | 4.00                               | 4                                  | 0.95                            | 4.22                                                                                                                                                       | 4.36  | 4.51  | 4.67  | 5.03  |
| 1                                   | 0.2                             | 45                                 | 0.80                                 | 5.00                               | 4                                  | 0.95                            | 5.25                                                                                                                                                       | 5.43  | 5.62  | 5.82  | 6.28  |
| 1                                   | 0.2                             | 45                                 | 0.80                                 | 6.00                               | 4                                  | 0.95                            | 6.29                                                                                                                                                       | 6.50  | 6.73  | 6.97  | 7.52  |
| 1                                   | 0.2                             | 45                                 | 0.80                                 | 8.00                               | 4                                  | 0.95                            | 8.35                                                                                                                                                       | 8.64  | 8.94  | 9.27  | 10.01 |

| 14334HP   |                               |                               |
|-----------|-------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
|           |                               | €                             |
| 438399    | 14334HP 1X.05X4X45X4          |                               |
| 438400    | 14334HP 1X.05X5X45X4          |                               |
| 438401    | 14334HP 1X.05X6X45X4          |                               |
| 438402    | 14334HP 1X.05X8X45X4          |                               |
| 438403    | 14334HP 1X.05X10X45X4         |                               |
| 438404    | 14334HP 1X.05X12X45X4         |                               |
| 438405    | 14334HP 1X.05X16X50X4         |                               |
| 438406    | 14334HP 1X.1X4X45X4           |                               |
| 438407    | 14334HP 1X.1X5X45X4           |                               |
| 438408    | 14334HP 1X.1X6X45X4           |                               |
| 438409    | 14334HP 1X.1X8X45X4           |                               |
| 438410    | 14334HP 1X.1X10X45X4          |                               |
| 438411    | 14334HP 1X.1X12X45X4          |                               |
| 438412    | 14334HP 1X.1X16X50X4          |                               |
| 437672    | 14334HP 1X.2X4X45X4           |                               |
| 438413    | 14334HP 1X.2X5X45X4           |                               |
| 437673    | 14334HP 1X.2X6X45X4           |                               |
| 437674    | 14334HP 1X.2X8X45X4           |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

Frese toriche con scarico in metallo duro integrale micrograna.  
Corner radius end mills long neck in solid carbide micro grain.

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |    |       |    |    |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-------|----|----|
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30°                                                                                                                                                        | 1° | 1°30' | 2° | 3° |

| 14334HP   |                               |                                                                                     |                               |
|-----------|-------------------------------|-------------------------------------------------------------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code |  | Prezzo utensile<br>Tool Price |
|           |                               |                                                                                     | €                             |

|     |     |    |      |       |   |      |       |       |       |       |        |
|-----|-----|----|------|-------|---|------|-------|-------|-------|-------|--------|
| 1   | 0.2 | 45 | 0.80 | 10.00 | 4 | 0.95 | 10.42 | 10.78 | 11.16 | 11.57 | 12.49  |
| 1   | 0.2 | 45 | 0.80 | 12.00 | 4 | 0.95 | 12.49 | 12.92 | 13.38 | 13.87 | 14.98  |
| 1   | 0.2 | 50 | 0.80 | 16.00 | 4 | 0.95 | 16.62 | 17.20 | 17.81 | 18.47 | 19.95  |
| 1   | 0.3 | 45 | 0.80 | 4.00  | 4 | 0.95 | 4.22  | 4.35  | 4.50  | 4.66  | 5.01   |
| 1   | 0.3 | 45 | 0.80 | 5.00  | 4 | 0.95 | 5.25  | 5.42  | 5.61  | 5.81  | 6.25   |
| 1   | 0.3 | 45 | 0.80 | 6.00  | 4 | 0.95 | 6.28  | 6.49  | 6.72  | 6.96  | 7.50   |
| 1   | 0.3 | 45 | 0.80 | 8.00  | 4 | 0.95 | 8.35  | 8.63  | 8.93  | 9.26  | 9.98   |
| 1   | 0.3 | 45 | 0.80 | 10.00 | 4 | 0.95 | 10.42 | 10.77 | 11.15 | 11.56 | 12.47  |
| 1   | 0.3 | 45 | 0.80 | 12.00 | 4 | 0.95 | 12.49 | 12.91 | 13.37 | 13.86 | 14.96  |
| 1   | 0.3 | 50 | 0.80 | 16.00 | 4 | 0.95 | 16.62 | 17.19 | 17.80 | 18.46 | 19.93  |
| 1.2 | 0.1 | 45 | 1.00 | 4.00  | 4 | 1.14 | 4.24  | 4.39  | 4.54  | 4.71  | 5.08   |
| 1.2 | 0.1 | 45 | 1.00 | 6.00  | 4 | 1.14 | 6.31  | 6.53  | 6.76  | 7.01  | 7.57   |
| 1.2 | 0.1 | 45 | 1.00 | 8.00  | 4 | 1.14 | 8.38  | 8.67  | 8.97  | 9.31  | 10.06  |
| 1.2 | 0.1 | 45 | 1.00 | 12.00 | 4 | 1.14 | 12.51 | 12.94 | 13.41 | 13.91 | 15.03  |
| 1.2 | 0.2 | 45 | 1.00 | 4.00  | 4 | 1.14 | 4.24  | 4.38  | 4.53  | 4.69  | 5.06   |
| 1.2 | 0.2 | 45 | 1.00 | 6.00  | 4 | 1.14 | 6.31  | 6.52  | 6.75  | 6.99  | 7.54   |
| 1.2 | 0.2 | 45 | 1.00 | 8.00  | 4 | 1.14 | 8.37  | 8.66  | 8.96  | 9.29  | 10.03  |
| 1.2 | 0.2 | 45 | 1.00 | 12.00 | 4 | 1.14 | 12.51 | 12.94 | 13.40 | 13.89 | 15.00  |
| 1.2 | 0.3 | 45 | 1.00 | 4.00  | 4 | 1.14 | 4.24  | 4.37  | 4.52  | 4.68  | 5.03   |
| 1.2 | 0.3 | 45 | 1.00 | 6.00  | 4 | 1.14 | 6.30  | 6.51  | 6.74  | 6.98  | 7.52   |
| 1.2 | 0.3 | 45 | 1.00 | 8.00  | 4 | 1.14 | 8.37  | 8.65  | 8.95  | 9.28  | 10.01  |
| 1.2 | 0.3 | 45 | 1.00 | 12.00 | 4 | 1.14 | 12.50 | 12.93 | 13.39 | 13.88 | 14.98  |
| 1.5 | 0.1 | 45 | 1.35 | 6.00  | 4 | 1.44 | 6.31  | 6.53  | 6.76  | 7.01  | 7.57   |
| 1.5 | 0.1 | 45 | 1.35 | 8.00  | 4 | 1.44 | 8.38  | 8.67  | 8.97  | 9.31  | 10.06  |
| 1.5 | 0.1 | 45 | 1.35 | 12.00 | 4 | 1.44 | 12.51 | 12.94 | 13.41 | 13.91 | 15.03  |
| 1.5 | 0.1 | 50 | 1.35 | 16.00 | 4 | 1.44 | 16.65 | 17.22 | 17.84 | 18.51 | 20.00  |
| 1.5 | 0.1 | 50 | 1.35 | 20.00 | 4 | 1.44 | 20.78 | 21.50 | 22.27 | 23.11 | libero |
| 1.5 | 0.2 | 45 | 1.35 | 6.00  | 4 | 1.44 | 6.31  | 6.52  | 6.75  | 6.99  | 7.54   |
| 1.5 | 0.2 | 45 | 1.35 | 8.00  | 4 | 1.44 | 8.37  | 8.66  | 8.96  | 9.29  | 10.03  |
| 1.5 | 0.2 | 45 | 1.35 | 12.00 | 4 | 1.44 | 12.51 | 12.94 | 13.40 | 13.89 | 15.00  |
| 1.5 | 0.2 | 50 | 1.35 | 16.00 | 4 | 1.44 | 16.64 | 17.22 | 17.83 | 18.49 | 19.98  |
| 1.5 | 0.2 | 50 | 1.35 | 20.00 | 4 | 1.44 | 20.78 | 21.49 | 22.26 | 23.09 | libero |
| 1.5 | 0.3 | 45 | 1.35 | 6.00  | 4 | 1.44 | 6.30  | 6.51  | 6.74  | 6.98  | 7.52   |
| 1.5 | 0.3 | 45 | 1.35 | 8.00  | 4 | 1.44 | 8.37  | 8.65  | 8.95  | 9.28  | 10.01  |
| 1.5 | 0.3 | 45 | 1.35 | 12.00 | 4 | 1.44 | 12.50 | 12.93 | 13.39 | 13.88 | 14.98  |
| 1.5 | 0.3 | 50 | 1.35 | 16.00 | 4 | 1.44 | 16.64 | 17.21 | 17.82 | 18.48 | 19.95  |
| 1.5 | 0.3 | 50 | 1.35 | 20.00 | 4 | 1.44 | 20.77 | 21.49 | 22.25 | 23.08 | libero |
| 1.5 | 0.5 | 45 | 1.35 | 6.00  | 4 | 1.44 | 6.30  | 6.50  | 6.71  | 6.95  | 7.47   |
| 1.5 | 0.5 | 45 | 1.35 | 8.00  | 4 | 1.44 | 8.36  | 8.64  | 8.93  | 9.25  | 9.96   |

|        |         |                |
|--------|---------|----------------|
| 437675 | 14334HP | 1X.2X10X45X4   |
| 437676 | 14334HP | 1X.2X12X45X4   |
| 437677 | 14334HP | 1X.2X16X50X4   |
| 438414 | 14334HP | 1X.3X4X45X4    |
| 438415 | 14334HP | 1X.3X5X45X4    |
| 438416 | 14334HP | 1X.3X6X45X4    |
| 438417 | 14334HP | 1X.3X8X45X4    |
| 438418 | 14334HP | 1X.3X10X45X4   |
| 438419 | 14334HP | 1X.3X12X45X4   |
| 438420 | 14334HP | 1X.3X16X50X4   |
| 438421 | 14334HP | 1.2X.1X4X45X4  |
| 438422 | 14334HP | 1.2X.1X6X45X4  |
| 438423 | 14334HP | 1.2X.1X8X45X4  |
| 438424 | 14334HP | 1.2X.1X12X45X4 |
| 438425 | 14334HP | 1.2X.2X4X45X4  |
| 437678 | 14334HP | 1.2X.2X6X45X4  |
| 437679 | 14334HP | 1.2X.2X8X45X4  |
| 437680 | 14334HP | 1.2X.2X12X45X4 |
| 438426 | 14334HP | 1.2X.3X4X45X4  |
| 438427 | 14334HP | 1.2X.3X6X45X4  |
| 438428 | 14334HP | 1.2X.3X8X45X4  |
| 438429 | 14334HP | 1.2X.3X12X45X4 |
| 438430 | 14334HP | 1.5X.1X6X45X4  |
| 438431 | 14334HP | 1.5X.1X8X45X4  |
| 438432 | 14334HP | 1.5X.1X12X45X4 |
| 438433 | 14334HP | 1.5X.1X16X50X4 |
| 438434 | 14334HP | 1.5X.1X20X50X4 |
| 437681 | 14334HP | 1.5X.2X6X45X4  |
| 437682 | 14334HP | 1.5X.2X8X45X4  |
| 437683 | 14334HP | 1.5X.2X12X45X4 |
| 437684 | 14334HP | 1.5X.2X16X50X4 |
| 437685 | 14334HP | 1.5X.2X20X50X4 |
| 438435 | 14334HP | 1.5X.3X6X45X4  |
| 438436 | 14334HP | 1.5X.3X8X45X4  |
| 438437 | 14334HP | 1.5X.3X12X45X4 |
| 438438 | 14334HP | 1.5X.3X16X50X4 |
| 438439 | 14334HP | 1.5X.3X20X50X4 |
| 437686 | 14334HP | 1.5X.5X6X45X4  |
| 437687 | 14334HP | 1.5X.5X8X45X4  |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

|                                     |                                 |                                    |                                      |                                    |                                    |                                 |                                                                                                                                                            |       |       |        |        | 14334HP   |                               |                                                                                     |  |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|--------|--------|-----------|-------------------------------|-------------------------------------------------------------------------------------|--|-------------------------------|
| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |       |        |        | ART. NUM. | Codice d'ordine<br>Order code |  |  | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30'                                                                                                                                                        | 1°    | 1°30' | 2°     | 3°     |           |                               | €                                                                                   |  |                               |
| 1.5                                 | 0.5                             | 45                                 | 1.35                                 | 12.00                              | 4                                  | 1.44                            | 12.50                                                                                                                                                      | 12.92 | 13.36 | 13.85  | 14.93  | 437688    | 14334HP                       | 1.5X.5X12X45X4                                                                      |  |                               |
| 1.5                                 | 0.5                             | 50                                 | 1.35                                 | 16.00                              | 4                                  | 1.44                            | 16.63                                                                                                                                                      | 17.19 | 17.80 | 18.45  | 19.90  | 438440    | 14334HP                       | 1.5X.5X16X50X4                                                                      |  |                               |
| 1.5                                 | 0.5                             | 50                                 | 1.35                                 | 20.00                              | 4                                  | 1.44                            | 20.77                                                                                                                                                      | 21.47 | 22.23 | 23.05  | libero | 438441    | 14334HP                       | 1.5X.5X20X50X4                                                                      |  |                               |
| 2                                   | 0.1                             | 45                                 | 1.70                                 | 6.00                               | 4                                  | 1.92                            | 6.35                                                                                                                                                       | 6.57  | 6.80  | 7.05   | 7.62   | 438442    | 14334HP                       | 2X.1X6X45X4                                                                         |  |                               |
| 2                                   | 0.1                             | 45                                 | 1.70                                 | 8.00                               | 4                                  | 1.92                            | 8.42                                                                                                                                                       | 8.71  | 9.02  | 9.35   | 10.10  | 438443    | 14334HP                       | 2X.1X8X45X4                                                                         |  |                               |
| 2                                   | 0.1                             | 45                                 | 1.70                                 | 10.00                              | 4                                  | 1.92                            | 10.48                                                                                                                                                      | 10.84 | 11.23 | 11.65  | 12.59  | 438444    | 14334HP                       | 2X.1X10X45X4                                                                        |  |                               |
| 2                                   | 0.1                             | 45                                 | 1.70                                 | 12.00                              | 4                                  | 1.92                            | 12.55                                                                                                                                                      | 12.98 | 13.45 | 13.95  | 15.07  | 438445    | 14334HP                       | 2X.1X12X45X4                                                                        |  |                               |
| 2                                   | 0.1                             | 50                                 | 1.70                                 | 16.00                              | 4                                  | 1.92                            | 16.68                                                                                                                                                      | 17.26 | 17.88 | 18.55  | libero | 438446    | 14334HP                       | 2X.1X16X50X4                                                                        |  |                               |
| 2                                   | 0.1                             | 50                                 | 1.70                                 | 20.00                              | 4                                  | 1.92                            | 20.82                                                                                                                                                      | 21.54 | 22.32 | 23.15  | libero | 438447    | 14334HP                       | 2X.1X20X50X4                                                                        |  |                               |
| 2                                   | 0.1                             | 60                                 | 1.70                                 | 25.00                              | 4                                  | 1.92                            | 25.99                                                                                                                                                      | 26.89 | 27.86 | libero | libero | 438448    | 14334HP                       | 2X.1X25X60X4                                                                        |  |                               |
| 2                                   | 0.2                             | 45                                 | 1.70                                 | 6.00                               | 4                                  | 1.92                            | 6.34                                                                                                                                                       | 6.56  | 6.79  | 7.04   | 7.59   | 438449    | 14334HP                       | 2X.2X6X45X4                                                                         |  |                               |
| 2                                   | 0.2                             | 45                                 | 1.70                                 | 8.00                               | 4                                  | 1.92                            | 8.41                                                                                                                                                       | 8.70  | 9.01  | 9.34   | 10.08  | 438450    | 14334HP                       | 2X.2X8X45X4                                                                         |  |                               |
| 2                                   | 0.2                             | 45                                 | 1.70                                 | 10.00                              | 4                                  | 1.92                            | 10.48                                                                                                                                                      | 10.84 | 11.22 | 11.64  | 12.56  | 438451    | 14334HP                       | 2X.2X10X45X4                                                                        |  |                               |
| 2                                   | 0.2                             | 45                                 | 1.70                                 | 12.00                              | 4                                  | 1.92                            | 12.55                                                                                                                                                      | 12.98 | 13.44 | 13.93  | 15.05  | 437689    | 14334HP                       | 2X.2X12X45X4                                                                        |  |                               |
| 2                                   | 0.2                             | 50                                 | 1.70                                 | 16.00                              | 4                                  | 1.92                            | 16.68                                                                                                                                                      | 17.26 | 17.87 | 18.53  | libero | 437690    | 14334HP                       | 2X.2X16X50X4                                                                        |  |                               |
| 2                                   | 0.2                             | 50                                 | 1.70                                 | 20.00                              | 4                                  | 1.92                            | 20.82                                                                                                                                                      | 21.53 | 22.31 | 23.13  | libero | 437691    | 14334HP                       | 2X.2X20X50X4                                                                        |  |                               |
| 2                                   | 0.2                             | 60                                 | 1.70                                 | 25.00                              | 4                                  | 1.92                            | 25.98                                                                                                                                                      | 26.88 | 27.85 | 28.88  | libero | 438452    | 14334HP                       | 2X.2X25X60X4                                                                        |  |                               |
| 2                                   | 0.3                             | 45                                 | 1.70                                 | 6.00                               | 4                                  | 1.92                            | 6.34                                                                                                                                                       | 6.55  | 6.78  | 7.02   | 7.57   | 438453    | 14334HP                       | 2X.3X6X45X4                                                                         |  |                               |
| 2                                   | 0.3                             | 45                                 | 1.70                                 | 8.00                               | 4                                  | 1.92                            | 8.41                                                                                                                                                       | 8.69  | 8.99  | 9.32   | 10.05  | 438454    | 14334HP                       | 2X.3X8X45X4                                                                         |  |                               |
| 2                                   | 0.3                             | 45                                 | 1.70                                 | 10.00                              | 4                                  | 1.92                            | 10.48                                                                                                                                                      | 10.83 | 11.21 | 11.62  | 12.54  | 438455    | 14334HP                       | 2X.3X10X45X4                                                                        |  |                               |
| 2                                   | 0.3                             | 45                                 | 1.70                                 | 12.00                              | 4                                  | 1.92                            | 12.54                                                                                                                                                      | 12.97 | 13.43 | 13.92  | 15.03  | 438456    | 14334HP                       | 2X.3X12X45X4                                                                        |  |                               |
| 2                                   | 0.3                             | 50                                 | 1.70                                 | 16.00                              | 4                                  | 1.92                            | 16.68                                                                                                                                                      | 17.25 | 17.86 | 18.52  | libero | 438457    | 14334HP                       | 2X.3X16X50X4                                                                        |  |                               |
| 2                                   | 0.3                             | 50                                 | 1.70                                 | 20.00                              | 4                                  | 1.92                            | 20.81                                                                                                                                                      | 21.53 | 22.29 | 23.12  | libero | 438458    | 14334HP                       | 2X.3X20X50X4                                                                        |  |                               |
| 2                                   | 0.3                             | 60                                 | 1.70                                 | 25.00                              | 4                                  | 1.92                            | 25.98                                                                                                                                                      | 26.88 | 27.84 | 28.87  | libero | 438459    | 14334HP                       | 2X.3X25X60X4                                                                        |  |                               |
| 2                                   | 0.5                             | 45                                 | 1.70                                 | 6.00                               | 4                                  | 1.92                            | 6.33                                                                                                                                                       | 6.54  | 6.76  | 6.99   | 7.52   | 438460    | 14334HP                       | 2X.5X6X45X4                                                                         |  |                               |
| 2                                   | 0.5                             | 45                                 | 1.70                                 | 8.00                               | 4                                  | 1.92                            | 8.40                                                                                                                                                       | 8.68  | 8.97  | 9.29   | 10.00  | 438461    | 14334HP                       | 2X.5X8X45X4                                                                         |  |                               |
| 2                                   | 0.5                             | 45                                 | 1.70                                 | 10.00                              | 4                                  | 1.92                            | 10.47                                                                                                                                                      | 10.82 | 11.19 | 11.59  | 12.49  | 437692    | 14334HP                       | 2X.5X10X45X4                                                                        |  |                               |
| 2                                   | 0.5                             | 45                                 | 1.70                                 | 12.00                              | 4                                  | 1.92                            | 12.54                                                                                                                                                      | 12.96 | 13.41 | 13.89  | 14.98  | 437693    | 14334HP                       | 2X.5X12X45X4                                                                        |  |                               |
| 2                                   | 0.5                             | 50                                 | 1.70                                 | 16.00                              | 4                                  | 1.92                            | 16.67                                                                                                                                                      | 17.23 | 17.84 | 18.49  | libero | 437694    | 14334HP                       | 2X.5X16X50X4                                                                        |  |                               |
| 2                                   | 0.5                             | 50                                 | 1.70                                 | 20.00                              | 4                                  | 1.92                            | 20.81                                                                                                                                                      | 21.51 | 22.27 | 23.09  | libero | 437695    | 14334HP                       | 2X.5X20X50X4                                                                        |  |                               |
| 2                                   | 0.5                             | 60                                 | 1.70                                 | 25.00                              | 4                                  | 1.92                            | 25.97                                                                                                                                                      | 26.86 | 27.81 | 28.84  | libero | 438462    | 14334HP                       | 2X.5X25X60X4                                                                        |  |                               |
| 2.5                                 | 0.1                             | 45                                 | 2.00                                 | 10.00                              | 4                                  | 2.39                            | 10.54                                                                                                                                                      | 10.90 | 11.29 | 11.71  | 12.66  | 438463    | 14334HP                       | 2.5X.1X10X45X4                                                                      |  |                               |
| 2.5                                 | 0.1                             | 50                                 | 2.00                                 | 16.00                              | 4                                  | 2.39                            | 16.74                                                                                                                                                      | 17.32 | 17.94 | 18.61  | libero | 438464    | 14334HP                       | 2.5X.1X16X50X4                                                                      |  |                               |
| 2.5                                 | 0.1                             | 60                                 | 2.00                                 | 25.00                              | 4                                  | 2.39                            | 26.05                                                                                                                                                      | 26.95 | 27.92 | libero | libero | 438655    | 14334HP                       | 2.5X.1X25X60X4                                                                      |  |                               |
| 2.5                                 | 0.2                             | 45                                 | 2.00                                 | 10.00                              | 4                                  | 2.39                            | 10.54                                                                                                                                                      | 10.90 | 11.28 | 11.70  | 12.63  | 437696    | 14334HP                       | 2.5X.2X10X45X4                                                                      |  |                               |
| 2.5                                 | 0.2                             | 50                                 | 2.00                                 | 16.00                              | 4                                  | 2.39                            | 16.74                                                                                                                                                      | 17.32 | 17.93 | 18.60  | libero | 437697    | 14334HP                       | 2.5X.2X16X50X4                                                                      |  |                               |
| 2.5                                 | 0.2                             | 60                                 | 2.00                                 | 25.00                              | 4                                  | 2.39                            | 26.04                                                                                                                                                      | 26.94 | 27.91 | libero | libero | 438466    | 14334HP                       | 2.5X.2X25X60X4                                                                      |  |                               |
| 2.5                                 | 0.3                             | 45                                 | 2.00                                 | 10.00                              | 4                                  | 2.39                            | 10.53                                                                                                                                                      | 10.89 | 11.27 | 11.68  | 12.61  | 438467    | 14334HP                       | 2.5X.3X10X45X4                                                                      |  |                               |
| 2.5                                 | 0.3                             | 50                                 | 2.00                                 | 16.00                              | 4                                  | 2.39                            | 16.74                                                                                                                                                      | 17.31 | 17.92 | 18.58  | libero | 438468    | 14334HP                       | 2.5X.3X16X50X4                                                                      |  |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page &gt;&gt;

Frese toriche con scarico in metallo duro integrale micrograna.  
Corner radius end mills long neck in solid carbide micro grain.

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |    |       |    |    |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-------|----|----|
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30°                                                                                                                                                        | 1° | 1°30' | 2° | 3° |

| 14334HP   |                               |                                                                                     |                               |
|-----------|-------------------------------|-------------------------------------------------------------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code |  | Prezzo utensile<br>Tool Price |
|           |                               |                                                                                     | €                             |

|     |     |    |      |       |   |      |       |       |       |        |        |
|-----|-----|----|------|-------|---|------|-------|-------|-------|--------|--------|
| 2.5 | 0.3 | 60 | 2.00 | 25.00 | 4 | 2.39 | 26.04 | 26.94 | 27.90 | libero | libero |
| 2.5 | 0.5 | 45 | 2.00 | 10.00 | 4 | 2.39 | 10.53 | 10.88 | 11.25 | 11.65  | 12.56  |
| 2.5 | 0.5 | 50 | 2.00 | 16.00 | 4 | 2.39 | 16.73 | 17.29 | 17.90 | 18.55  | libero |
| 2.5 | 0.5 | 60 | 2.00 | 25.00 | 4 | 2.39 | 26.03 | 26.92 | 27.88 | libero | libero |
| 3   | 0.1 | 50 | 2.50 | 10.00 | 6 | 2.86 | 10.60 | 10.96 | 11.36 | 11.78  | 12.73  |
| 3   | 0.1 | 50 | 2.50 | 12.00 | 6 | 2.86 | 12.67 | 13.10 | 13.57 | 14.08  | 15.21  |
| 3   | 0.1 | 60 | 2.50 | 16.00 | 6 | 2.86 | 16.80 | 17.38 | 18.01 | 18.68  | 20.19  |
| 3   | 0.1 | 60 | 2.50 | 20.00 | 6 | 2.86 | 20.93 | 21.66 | 22.44 | 23.28  | 25.16  |
| 3   | 0.1 | 60 | 2.50 | 25.00 | 6 | 2.86 | 26.10 | 27.01 | 27.98 | 29.03  | libero |
| 3   | 0.1 | 70 | 2.50 | 30.00 | 6 | 2.86 | 31.27 | 32.36 | 33.52 | 34.78  | libero |
| 3   | 0.1 | 70 | 2.50 | 35.00 | 6 | 2.86 | 36.44 | 37.71 | 39.06 | 40.53  | libero |
| 3   | 0.2 | 50 | 2.50 | 10.00 | 6 | 2.86 | 10.59 | 10.96 | 11.35 | 11.76  | 12.70  |
| 3   | 0.2 | 50 | 2.50 | 12.00 | 6 | 2.86 | 12.66 | 13.10 | 13.56 | 14.06  | 15.19  |
| 3   | 0.2 | 60 | 2.50 | 16.00 | 6 | 2.86 | 16.80 | 17.38 | 18.00 | 18.66  | 20.16  |
| 3   | 0.2 | 60 | 2.50 | 20.00 | 6 | 2.86 | 20.93 | 21.65 | 22.43 | 23.26  | 25.13  |
| 3   | 0.2 | 60 | 2.50 | 25.00 | 6 | 2.86 | 26.10 | 27.00 | 27.97 | 29.01  | libero |
| 3   | 0.2 | 70 | 2.50 | 30.00 | 6 | 2.86 | 31.27 | 32.35 | 33.51 | 34.76  | libero |
| 3   | 0.2 | 70 | 2.50 | 35.00 | 6 | 2.86 | 36.44 | 37.70 | 39.05 | 40.51  | libero |
| 3   | 0.3 | 50 | 2.50 | 10.00 | 6 | 2.86 | 10.59 | 10.95 | 11.34 | 11.75  | 12.68  |
| 3   | 0.3 | 50 | 2.50 | 12.00 | 6 | 2.86 | 12.66 | 13.09 | 13.55 | 14.05  | 15.16  |
| 3   | 0.3 | 60 | 2.50 | 16.00 | 6 | 2.86 | 16.79 | 17.37 | 17.99 | 18.65  | 20.14  |
| 3   | 0.3 | 60 | 2.50 | 20.00 | 6 | 2.86 | 20.93 | 21.65 | 22.42 | 23.25  | 25.11  |
| 3   | 0.3 | 60 | 2.50 | 25.00 | 6 | 2.86 | 26.10 | 27.00 | 27.96 | 29.00  | libero |
| 3   | 0.3 | 70 | 2.50 | 30.00 | 6 | 2.86 | 31.26 | 32.34 | 33.50 | 34.75  | libero |
| 3   | 0.3 | 70 | 2.50 | 35.00 | 6 | 2.86 | 36.43 | 37.69 | 39.04 | 40.50  | libero |
| 3   | 0.5 | 50 | 2.50 | 10.00 | 6 | 2.86 | 10.58 | 10.94 | 11.31 | 11.72  | 12.63  |
| 3   | 0.5 | 50 | 2.50 | 12.00 | 6 | 2.86 | 12.65 | 13.08 | 13.53 | 14.02  | 15.12  |
| 3   | 0.5 | 60 | 2.50 | 16.00 | 6 | 2.86 | 16.79 | 17.35 | 17.96 | 18.62  | 20.09  |
| 3   | 0.5 | 60 | 2.50 | 20.00 | 6 | 2.86 | 20.92 | 21.63 | 22.40 | 23.22  | 25.06  |
| 3   | 0.5 | 60 | 2.50 | 25.00 | 6 | 2.86 | 26.09 | 26.98 | 27.94 | 28.97  | libero |
| 3   | 0.5 | 70 | 2.50 | 30.00 | 6 | 2.86 | 31.26 | 32.33 | 33.48 | 34.72  | libero |
| 3   | 0.5 | 70 | 2.50 | 35.00 | 6 | 2.86 | 36.43 | 37.68 | 39.02 | 40.47  | libero |
| 3   | 1.0 | 50 | 2.50 | 10.00 | 6 | 2.86 | 10.57 | 10.90 | 11.26 | 11.64  | 12.51  |
| 3   | 1.0 | 50 | 2.50 | 12.00 | 6 | 2.86 | 12.64 | 13.04 | 13.48 | 13.94  | 14.99  |
| 3   | 1.0 | 60 | 2.50 | 16.00 | 6 | 2.86 | 16.77 | 17.32 | 17.91 | 18.54  | 19.97  |
| 3   | 1.0 | 60 | 2.50 | 20.00 | 6 | 2.86 | 20.90 | 21.60 | 22.34 | 23.14  | 24.94  |
| 3   | 1.0 | 60 | 2.50 | 25.00 | 6 | 2.86 | 26.07 | 26.95 | 27.88 | 28.89  | libero |
| 3   | 1.0 | 70 | 2.50 | 30.00 | 6 | 2.86 | 31.24 | 32.30 | 33.43 | 34.64  | libero |
| 3   | 1.0 | 70 | 2.50 | 35.00 | 6 | 2.86 | 36.41 | 37.64 | 38.97 | 40.39  | libero |

|        |         |                |
|--------|---------|----------------|
| 438469 | 14334HP | 2.5X.3X25X60X4 |
| 437698 | 14334HP | 2.5X.5X10X45X4 |
| 437699 | 14334HP | 2.5X.5X16X50X4 |
| 438470 | 14334HP | 2.5X.5X25X60X4 |
| 438471 | 14334HP | 3X.1X10X50X6   |
| 438472 | 14334HP | 3X.1X12X50X6   |
| 438473 | 14334HP | 3X.1X16X60X6   |
| 438474 | 14334HP | 3X.1X20X60X6   |
| 438475 | 14334HP | 3X.1X25X60X6   |
| 438476 | 14334HP | 3X.1X30X70X6   |
| 438477 | 14334HP | 3X.1X35X70X6   |
| 437700 | 14334HP | 3X.2X10X50X6   |
| 438478 | 14334HP | 3X.2X12X50X6   |
| 437701 | 14334HP | 3X.2X16X60X6   |
| 438479 | 14334HP | 3X.2X20X60X6   |
| 438480 | 14334HP | 3X.2X25X60X6   |
| 438481 | 14334HP | 3X.2X30X70X6   |
| 438482 | 14334HP | 3X.2X35X70X6   |
| 438483 | 14334HP | 3X.3X10X50X6   |
| 438484 | 14334HP | 3X.3X12X50X6   |
| 438485 | 14334HP | 3X.3X16X60X6   |
| 438486 | 14334HP | 3X.3X20X60X6   |
| 438487 | 14334HP | 3X.3X25X60X6   |
| 438488 | 14334HP | 3X.3X30X70X6   |
| 438489 | 14334HP | 3X.3X35X70X6   |
| 437702 | 14334HP | 3X.5X10X50X6   |
| 438490 | 14334HP | 3X.5X12X50X6   |
| 437703 | 14334HP | 3X.5X16X60X6   |
| 437704 | 14334HP | 3X.5X20X60X6   |
| 438491 | 14334HP | 3X.5X25X60X6   |
| 438492 | 14334HP | 3X.5X30X70X6   |
| 438493 | 14334HP | 3X.5X35X70X6   |
| 438494 | 14334HP | 3X.1X10X50X6   |
| 438495 | 14334HP | 3X.1X12X50X6   |
| 437705 | 14334HP | 3X.1X16X60X6   |
| 438496 | 14334HP | 3X.1X20X60X6   |
| 438497 | 14334HP | 3X.1X25X60X6   |
| 438498 | 14334HP | 3X.1X30X70X6   |
| 438499 | 14334HP | 3X.1X35X70X6   |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

|                                     |                                 |                                    |                                      |                                    |                                    |                                 |                                                                                                                                                            |        |        |        |        | 14334HP   |                               |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--------|--------|-----------|-------------------------------|-------------------------------|
| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |        |        |        |        | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30°                                                                                                                                                        | 1°     | 1°30'  | 2°     | 3°     |           |                               | €                             |
| 4                                   | 0.1                             | 50                                 | 4.00                                 | 12.00                              | 6                                  | 3.80                            | 12.78                                                                                                                                                      | 13.22  | 13.70  | 14.21  | 15.35  | 438500    | 14334HP 4X.1X12X50X6          |                               |
| 4                                   | 0.1                             | 60                                 | 4.00                                 | 16.00                              | 6                                  | 3.80                            | 16.92                                                                                                                                                      | 17.50  | 18.13  | 18.81  | libero | 438501    | 14334HP 4X.1X16X60X6          |                               |
| 4                                   | 0.1                             | 60                                 | 4.00                                 | 20.00                              | 6                                  | 3.80                            | 21.05                                                                                                                                                      | 21.78  | 22.56  | 23.41  | libero | 438502    | 14334HP 4X.1X20X60X6          |                               |
| 4                                   | 0.1                             | 60                                 | 4.00                                 | 25.00                              | 6                                  | 3.80                            | 26.22                                                                                                                                                      | 27.13  | 28.11  | libero | libero | 438503    | 14334HP 4X.1X25X60X6          |                               |
| 4                                   | 0.1                             | 70                                 | 4.00                                 | 30.00                              | 6                                  | 3.80                            | 31.39                                                                                                                                                      | 32.48  | 33.65  | libero | libero | 438504    | 14334HP 4X.1X30X70X6          |                               |
| 4                                   | 0.1                             | 70                                 | 4.00                                 | 35.00                              | 6                                  | 3.80                            | 36.56                                                                                                                                                      | 37.83  | libero | libero | libero | 438505    | 14334HP 4X.1X35X70X6          |                               |
| 4                                   | 0.1                             | 80                                 | 4.00                                 | 40.00                              | 6                                  | 3.80                            | 41.72                                                                                                                                                      | 43.17  | libero | libero | libero | 438506    | 14334HP 4X.1X40X80X6          |                               |
| 4                                   | 0.2                             | 50                                 | 4.00                                 | 12.00                              | 6                                  | 3.80                            | 12.78                                                                                                                                                      | 13.22  | 13.69  | 14.19  | 15.33  | 438507    | 14334HP 4X.2X12X50X6          |                               |
| 4                                   | 0.2                             | 60                                 | 4.00                                 | 16.00                              | 6                                  | 3.80                            | 16.91                                                                                                                                                      | 17.50  | 18.12  | 18.79  | libero | 438508    | 14334HP 4X.2X16X60X6          |                               |
| 4                                   | 0.2                             | 60                                 | 4.00                                 | 20.00                              | 6                                  | 3.80                            | 21.05                                                                                                                                                      | 21.77  | 22.55  | 23.39  | libero | 438509    | 14334HP 4X.2X20X60X6          |                               |
| 4                                   | 0.2                             | 60                                 | 4.00                                 | 25.00                              | 6                                  | 3.80                            | 26.22                                                                                                                                                      | 27.12  | 28.09  | libero | libero | 438510    | 14334HP 4X.2X25X60X6          |                               |
| 4                                   | 0.2                             | 70                                 | 4.00                                 | 30.00                              | 6                                  | 3.80                            | 31.38                                                                                                                                                      | 32.47  | 33.64  | libero | libero | 438511    | 14334HP 4X.2X30X70X6          |                               |
| 4                                   | 0.2                             | 70                                 | 4.00                                 | 35.00                              | 6                                  | 3.80                            | 36.55                                                                                                                                                      | 37.82  | libero | libero | libero | 438512    | 14334HP 4X.2X35X70X6          |                               |
| 4                                   | 0.2                             | 80                                 | 4.00                                 | 40.00                              | 6                                  | 3.80                            | 41.72                                                                                                                                                      | 43.17  | libero | libero | libero | 438513    | 14334HP 4X.2X40X80X6          |                               |
| 4                                   | 0.3                             | 50                                 | 4.00                                 | 12.00                              | 6                                  | 3.80                            | 12.77                                                                                                                                                      | 13.21  | 13.68  | 14.18  | 15.30  | 438514    | 14334HP 4X.3X12X50X6          |                               |
| 4                                   | 0.3                             | 60                                 | 4.00                                 | 16.00                              | 6                                  | 3.80                            | 16.91                                                                                                                                                      | 17.49  | 18.11  | 18.78  | libero | 438515    | 14334HP 4X.3X16X60X6          |                               |
| 4                                   | 0.3                             | 60                                 | 4.00                                 | 20.00                              | 6                                  | 3.80                            | 21.04                                                                                                                                                      | 21.77  | 22.54  | 23.38  | libero | 438516    | 14334HP 4X.3X20X60X6          |                               |
| 4                                   | 0.3                             | 60                                 | 4.00                                 | 25.00                              | 6                                  | 3.80                            | 26.21                                                                                                                                                      | 27.12  | 28.08  | libero | libero | 438517    | 14334HP 4X.3X25X60X6          |                               |
| 4                                   | 0.3                             | 70                                 | 4.00                                 | 30.00                              | 6                                  | 3.80                            | 31.38                                                                                                                                                      | 32.46  | 33.63  | libero | libero | 438518    | 14334HP 4X.3X30X70X6          |                               |
| 4                                   | 0.3                             | 70                                 | 4.00                                 | 35.00                              | 6                                  | 3.80                            | 36.55                                                                                                                                                      | 37.81  | libero | libero | libero | 438519    | 14334HP 4X.3X35X70X6          |                               |
| 4                                   | 0.3                             | 80                                 | 4.00                                 | 40.00                              | 6                                  | 3.80                            | 41.72                                                                                                                                                      | 43.16  | libero | libero | libero | 438520    | 14334HP 4X.3X40X80X6          |                               |
| 4                                   | 0.5                             | 50                                 | 4.00                                 | 12.00                              | 6                                  | 3.80                            | 12.77                                                                                                                                                      | 13.20  | 13.65  | 14.15  | 15.26  | 438521    | 14334HP 4X.5X12X50X6          |                               |
| 4                                   | 0.5                             | 60                                 | 4.00                                 | 16.00                              | 6                                  | 3.80                            | 16.90                                                                                                                                                      | 17.47  | 18.09  | 18.75  | libero | 438522    | 14334HP 4X.5X16X60X6          |                               |
| 4                                   | 0.5                             | 60                                 | 4.00                                 | 20.00                              | 6                                  | 3.80                            | 21.04                                                                                                                                                      | 21.75  | 22.52  | 23.35  | libero | 438523    | 14334HP 4X.5X20X60X6          |                               |
| 4                                   | 0.5                             | 60                                 | 4.00                                 | 25.00                              | 6                                  | 3.80                            | 26.21                                                                                                                                                      | 27.10  | 28.06  | 29.10  | libero | 438524    | 14334HP 4X.5X25X60X6          |                               |
| 4                                   | 0.5                             | 70                                 | 4.00                                 | 30.00                              | 6                                  | 3.80                            | 31.37                                                                                                                                                      | 32.45  | 33.60  | libero | libero | 438525    | 14334HP 4X.5X30X70X6          |                               |
| 4                                   | 0.5                             | 70                                 | 4.00                                 | 35.00                              | 6                                  | 3.80                            | 36.54                                                                                                                                                      | 37.80  | libero | libero | libero | 438526    | 14334HP 4X.5X35X70X6          |                               |
| 4                                   | 0.5                             | 80                                 | 4.00                                 | 40.00                              | 6                                  | 3.80                            | 41.71                                                                                                                                                      | 43.15  | libero | libero | libero | 438527    | 14334HP 4X.5X40X80X6          |                               |
| 4                                   | 1.0                             | 50                                 | 4.00                                 | 12.00                              | 6                                  | 3.80                            | 12.75                                                                                                                                                      | 13.16  | 13.60  | 14.07  | 15.13  | 438528    | 14334HP 4X1X12X50X6           |                               |
| 4                                   | 1.0                             | 60                                 | 4.00                                 | 16.00                              | 6                                  | 3.80                            | 16.89                                                                                                                                                      | 17.44  | 18.03  | 18.67  | libero | 438529    | 14334HP 4X1X16X60X6           |                               |
| 4                                   | 1.0                             | 60                                 | 4.00                                 | 20.00                              | 6                                  | 3.80                            | 21.02                                                                                                                                                      | 21.72  | 22.47  | 23.27  | libero | 438530    | 14334HP 4X1X20X60X6           |                               |
| 4                                   | 1.0                             | 60                                 | 4.00                                 | 25.00                              | 6                                  | 3.80                            | 26.19                                                                                                                                                      | 27.07  | 28.01  | 29.02  | libero | 438531    | 14334HP 4X1X25X60X6           |                               |
| 4                                   | 1.0                             | 70                                 | 4.00                                 | 30.00                              | 6                                  | 3.80                            | 31.36                                                                                                                                                      | 32.42  | 33.55  | libero | libero | 438532    | 14334HP 4X1X30X70X6           |                               |
| 4                                   | 1.0                             | 70                                 | 4.00                                 | 35.00                              | 6                                  | 3.80                            | 36.53                                                                                                                                                      | 37.76  | 39.09  | libero | libero | 438533    | 14334HP 4X1X35X70X6           |                               |
| 4                                   | 1.0                             | 80                                 | 4.00                                 | 40.00                              | 6                                  | 3.80                            | 41.69                                                                                                                                                      | 43.11  | libero | libero | libero | 438534    | 14334HP 4X1X40X80X6           |                               |
| 5                                   | 0.1                             | 60                                 | 5.00                                 | 20.00                              | 6                                  | 4.75                            | 21.15                                                                                                                                                      | 21.88  | libero | libero | libero | 438535    | 14334HP 5X.1X20X60X6          |                               |
| 5                                   | 0.1                             | 80                                 | 5.00                                 | 40.00                              | 6                                  | 4.75                            | 41.82                                                                                                                                                      | libero | libero | libero | libero | 438536    | 14334HP 5X.1X40X80X6          |                               |
| 5                                   | 0.2                             | 60                                 | 5.00                                 | 20.00                              | 6                                  | 4.75                            | 21.14                                                                                                                                                      | 21.87  | libero | libero | libero | 438537    | 14334HP 5X.2X20X60X6          |                               |
| 5                                   | 0.2                             | 80                                 | 5.00                                 | 40.00                              | 6                                  | 4.75                            | 41.82                                                                                                                                                      | libero | libero | libero | libero | 438538    | 14334HP 5X.2X40X80X6          |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

Frese toriche con scarico in metallo duro integrale micrograna.  
Corner radius end mills long neck in solid carbide micro grain.

| 14334HP                             |                                 |                                    |                                      |                                    |                                    |                                 |                                                                                                                                                            |        |        |        |        | 14334HP   |                               |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--------|--------|-----------|-------------------------------|-------------------------------|
| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |        |        |        |        | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30°                                                                                                                                                        | 1°     | 1°30'  | 2°     | 3°     |           |                               | €                             |
| 5                                   | 0.3                             | 60                                 | 5.00                                 | 20.00                              | 6                                  | 4.75                            | 21.14                                                                                                                                                      | 21.87  | libero | libero | libero | 438539    | 14334HP 5X.3X20X60X6          |                               |
| 5                                   | 0.3                             | 80                                 | 5.00                                 | 40.00                              | 6                                  | 4.75                            | 41.81                                                                                                                                                      | libero | libero | libero | libero | 438540    | 14334HP 5X.3X40X80X6          |                               |
| 5                                   | 0.5                             | 60                                 | 5.00                                 | 20.00                              | 6                                  | 4.75                            | 21.13                                                                                                                                                      | 21.85  | libero | libero | libero | 438541    | 14334HP 5X.5X20X60X6          |                               |
| 5                                   | 0.5                             | 80                                 | 5.00                                 | 40.00                              | 6                                  | 4.75                            | 41.81                                                                                                                                                      | libero | libero | libero | libero | 438542    | 14334HP 5X.5X40X80X6          |                               |
| 5                                   | 1.0                             | 60                                 | 5.00                                 | 20.00                              | 6                                  | 4.75                            | 21.12                                                                                                                                                      | 21.82  | libero | libero | libero | 438543    | 14334HP 5X1X20X60X6           |                               |
| 5                                   | 1.0                             | 80                                 | 5.00                                 | 40.00                              | 6                                  | 4.75                            | 41.79                                                                                                                                                      | libero | libero | libero | libero | 438544    | 14334HP 5X1X40X80X6           |                               |
| 6                                   | 0.1                             | 60                                 | 6.00                                 | 20.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 438545    | 14334HP 6X.1X20X60X6          |                               |
| 6                                   | 0.1                             | 80                                 | 6.00                                 | 40.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 438546    | 14334HP 6X.1X40X80X6          |                               |
| 6                                   | 0.2                             | 60                                 | 6.00                                 | 20.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 438547    | 14334HP 6X.2X20X60X6          |                               |
| 6                                   | 0.2                             | 80                                 | 6.00                                 | 40.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 438548    | 14334HP 6X.2X40X80X6          |                               |
| 6                                   | 0.3                             | 60                                 | 6.00                                 | 20.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 438549    | 14334HP 6X.3X20X60X6          |                               |
| 6                                   | 0.3                             | 80                                 | 6.00                                 | 40.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 438550    | 14334HP 6X.3X40X80X6          |                               |
| 6                                   | 0.5                             | 60                                 | 6.00                                 | 20.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 438551    | 14334HP 6X.5X20X60X6          |                               |
| 6                                   | 0.5                             | 80                                 | 6.00                                 | 40.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 438552    | 14334HP 6X.5X40X80X6          |                               |
| 6                                   | 1.0                             | 60                                 | 6.00                                 | 20.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 438553    | 14334HP 6X1X20X60X6           |                               |
| 6                                   | 1.0                             | 80                                 | 6.00                                 | 40.00                              | 6                                  | 5.70                            | libero                                                                                                                                                     | libero | libero | libero | libero | 438554    | 14334HP 6X1X40X80X6           |                               |
| 8                                   | 0.3                             | 65                                 | 9.00                                 | 25.00                              | 8                                  | 7.60                            | libero                                                                                                                                                     | libero | libero | libero | libero | 438555    | 14334HP 8X.3X25X65X8          |                               |
| 8                                   | 0.5                             | 65                                 | 9.00                                 | 25.00                              | 8                                  | 7.60                            | libero                                                                                                                                                     | libero | libero | libero | libero | 438556    | 14334HP 8X.5X25X65X8          |                               |
| 8                                   | 1.0                             | 65                                 | 9.00                                 | 25.00                              | 8                                  | 7.60                            | libero                                                                                                                                                     | libero | libero | libero | libero | 438557    | 14334HP 8X1X25X65X8           |                               |
| 8                                   | 1.5                             | 65                                 | 9.00                                 | 25.00                              | 8                                  | 7.60                            | libero                                                                                                                                                     | libero | libero | libero | libero | 438558    | 14334HP 8X1.5X25X65X8         |                               |
| 10                                  | 0.5                             | 70                                 | 11.00                                | 25.00                              | 10                                 | 9.50                            | libero                                                                                                                                                     | libero | libero | libero | libero | 438559    | 14334HP 10X.5X25X70X10        |                               |
| 10                                  | 1.0                             | 70                                 | 11.00                                | 25.00                              | 10                                 | 9.50                            | libero                                                                                                                                                     | libero | libero | libero | libero | 438560    | 14334HP 10X1X25X70X10         |                               |
| 10                                  | 1.5                             | 70                                 | 11.00                                | 25.00                              | 10                                 | 9.50                            | libero                                                                                                                                                     | libero | libero | libero | libero | 438561    | 14334HP 10X1.5X25X70X10       |                               |
| 10                                  | 2.0                             | 70                                 | 11.00                                | 25.00                              | 10                                 | 9.50                            | libero                                                                                                                                                     | libero | libero | libero | libero | 438562    | 14334HP 10X2X25X70X10         |                               |
| 12                                  | 0.5                             | 80                                 | 12.00                                | 30.00                              | 12                                 | 11.50                           | libero                                                                                                                                                     | libero | libero | libero | libero | 438563    | 14334HP 12X.5X30X80X12        |                               |
| 12                                  | 1.0                             | 80                                 | 12.00                                | 30.00                              | 12                                 | 11.50                           | libero                                                                                                                                                     | libero | libero | libero | libero | 438564    | 14334HP 12X1X30X80X12         |                               |
| 12                                  | 1.5                             | 80                                 | 12.00                                | 30.00                              | 12                                 | 11.50                           | libero                                                                                                                                                     | libero | libero | libero | libero | 438565    | 14334HP 12X1.5X30X80X12       |                               |
| 12                                  | 2.0                             | 80                                 | 12.00                                | 30.00                              | 12                                 | 11.50                           | libero                                                                                                                                                     | libero | libero | libero | libero | 438566    | 14334HP 12X2X30X80X12         |                               |

**Frese sferiche in metallo duro integrale micrograna.**  
Ball nose end mills in solid carbide micro grain.

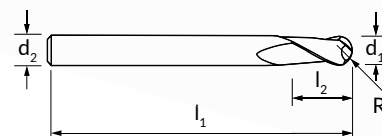
|  |  |   |  |   |
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|  |  |   |  | - |
|  |  | - |  |   |

## Operazioni di fresatura | Milling strategies:

|   |   |   |   |  |   |
|---|---|---|---|--|---|
| - | - | - | - |  | - |
|---|---|---|---|--|---|

## Gruppo materiali lavorabili | Group of working materials:

|   |   |   |   |   |   |                                                          |
|---|---|---|---|---|---|----------------------------------------------------------|
| P | M | K | N | S | H |                                                          |
| ○ | - | ○ | - | - | ● | ● Raccomandato - Most suitable<br>○ Possibile - Possible |



## Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø           | Raggio   Radius                         |
|-----------------------------------|-----------------------------------------|
| d ≤ 6: 0/-0.01<br>d > 6: 0/-0.015 | R ≤ 0.25: 0/-0.005<br>R > 0.25: 0/-0.01 |

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |

|     |      |    |     |   |
|-----|------|----|-----|---|
| 0.2 | 0.1  | 45 | 0.4 | 4 |
| 0.3 | 0.15 | 45 | 0.6 | 4 |
| 0.4 | 0.2  | 45 | 0.8 | 4 |
| 0.5 | 0.25 | 45 | 1   | 4 |
| 0.6 | 0.3  | 45 | 1.2 | 4 |
| 0.7 | 0.35 | 45 | 1.5 | 4 |
| 0.8 | 0.4  | 45 | 2   | 4 |
| 1   | 0.5  | 45 | 2.5 | 4 |
| 1   | 0.5  | 50 | 2.5 | 6 |
| 1.2 | 0.6  | 45 | 3   | 4 |
| 1.5 | 0.75 | 45 | 3   | 4 |
| 1.5 | 0.75 | 50 | 3   | 6 |
| 2   | 1    | 45 | 5   | 4 |
| 2   | 1    | 50 | 5   | 6 |
| 2.5 | 1.25 | 45 | 6   | 4 |
| 2.5 | 1.25 | 50 | 6   | 6 |
| 3   | 1.5  | 50 | 8   | 4 |
| 3   | 1.5  | 60 | 8   | 6 |

| 416RHP    |                               |                               |
|-----------|-------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
|           |                               | €                             |

|        |                    |
|--------|--------------------|
| 438567 | 416RHP .2X.4X45X4  |
| 438568 | 416RHP .3X.6X45X4  |
| 438569 | 416RHP .4X.8X45X4  |
| 438570 | 416RHP .5X1X45X4   |
| 438571 | 416RHP .6X1.2X45X4 |
| 438572 | 416RHP .7X1.5X45X4 |
| 438573 | 416RHP .8X2X45X4   |
| 437706 | 416RHP 1X2.5X45X4  |
| 437707 | 416RHP 1X2.5X50X6  |
| 438574 | 416RHP 1.2X3X45X4  |
| 437708 | 416RHP 1.5X3X45X4  |
| 437709 | 416RHP 1.5X3X50X6  |
| 437710 | 416RHP 2X5X45X4    |
| 437711 | 416RHP 2X5X50X6    |
| 438575 | 416RHP 2.5X6X45X4  |
| 438576 | 416RHP 2.5X6X50X6  |
| 437712 | 416RHP 3X8X50X4    |
| 437713 | 416RHP 3X8X60X6    |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

Frese sferiche in metallo duro integrale micrograna.  
Ball nose end mills in solid carbide micro grain.

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Diametro attacco<br>Shank diameter | 416RHP    |                               |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|-----------|-------------------------------|-------------------------------|
|                                     |                                 |                                    |                                      |                                    | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | d <sub>2</sub>                     |           |                               | €                             |
| 3.5                                 | 1.75                            | 50                                 | 8                                    | 4                                  | 438577    | 416RHP 3.5X8X50X4             |                               |
| 4                                   | 2                               | 60                                 | 8                                    | 4                                  | 437714    | 416RHP 4X8X60X4               |                               |
| 4                                   | 2                               | 60                                 | 8                                    | 6                                  | 437715    | 416RHP 4X8X60X6               |                               |
| 5                                   | 2.5                             | 60                                 | 10                                   | 6                                  | 437716    | 416RHP 5X10X60X6              |                               |
| 6                                   | 3                               | 60                                 | 12                                   | 6                                  | 437717    | 416RHP 6X12X60X6              |                               |
| 6                                   | 3                               | 70                                 | 12                                   | 6                                  | 438578    | 416RHP 6X12X70X6              |                               |
| 6                                   | 3                               | 80                                 | 12                                   | 6                                  | 438579    | 416RHP 6X12X80X6              |                               |
| 6                                   | 3                               | 90                                 | 12                                   | 6                                  | 437718    | 416RHP 6X12X90X6              |                               |
| 6                                   | 3                               | 100                                | 12                                   | 6                                  | 438580    | 416RHP 6X12X100X6             |                               |
| 7                                   | 3.5                             | 80                                 | 14                                   | 8                                  | 438581    | 416RHP 7X14X80X8              |                               |
| 8                                   | 4                               | 60                                 | 14                                   | 8                                  | 437719    | 416RHP 8X14X60X8              |                               |
| 8                                   | 4                               | 90                                 | 14                                   | 8                                  | 438582    | 416RHP 8X14X90X8              |                               |
| 8                                   | 4                               | 100                                | 14                                   | 8                                  | 437720    | 416RHP 8X14X100X8             |                               |
| 8                                   | 4                               | 110                                | 14                                   | 8                                  | 438583    | 416RHP 8X14X110X8             |                               |
| 9                                   | 4.5                             | 100                                | 16                                   | 10                                 | 438584    | 416RHP 9X16X100X10            |                               |
| 10                                  | 5                               | 70                                 | 18                                   | 10                                 | 437721    | 416RHP 10X18X70X10            |                               |
| 10                                  | 5                               | 90                                 | 18                                   | 10                                 | 438585    | 416RHP 10X18X90X10            |                               |
| 10                                  | 5                               | 100                                | 18                                   | 10                                 | 437722    | 416RHP 10X18X100X10           |                               |
| 12                                  | 6                               | 75                                 | 22                                   | 12                                 | 437723    | 416RHP 12X22X75X12            |                               |
| 12                                  | 6                               | 100                                | 22                                   | 12                                 | 438586    | 416RHP 12X22X100X12           |                               |
| 12                                  | 6                               | 110                                | 22                                   | 12                                 | 437724    | 416RHP 12X22X110X12           |                               |

Frese sferiche con scarico in metallo duro integrale micrograna.  
Ball nose long neck end mills in solid carbide micro grain.

|  |  |   |  |   |
|--|--|---|--|---|
|  |  |   |  | - |
|  |  | - |  |   |

#### Operazioni di fresatura | Milling strategies:

|   |   |   |   |  |   |
|---|---|---|---|--|---|
| - | - | - | - |  | - |
|---|---|---|---|--|---|

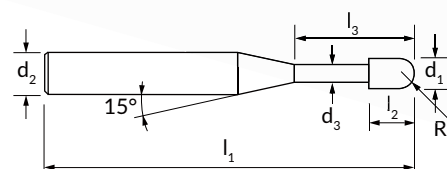
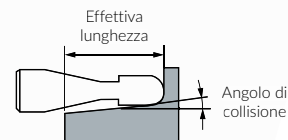
#### Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |
|---|---|---|---|---|---|
|   | - |   | - | - |   |

● Raccomandato - Most suitable  
○ Possibile - Possible

#### Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø           | Raggio   Radius                         |
|-----------------------------------|-----------------------------------------|
| d ≤ 6: 0/-0.01<br>d > 6: 0/-0.015 | R ≤ 0.25: 0/-0.005<br>R > 0.25: 0/-0.01 |



| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |    |       |    |    |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-------|----|----|
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30°                                                                                                                                                        | 1° | 1°30' | 2° | 3° |

|     |      |    |      |      |   |      |      |      |      |      |      |
|-----|------|----|------|------|---|------|------|------|------|------|------|
| 0.2 | 0.1  | 45 | 0.15 | 0.50 | 4 | 0.18 | 0.55 | 0.56 | 0.58 | 0.6  | 0.64 |
| 0.2 | 0.1  | 45 | 0.15 | 0.75 | 4 | 0.18 | 0.81 | 0.83 | 0.86 | 0.89 | 0.95 |
| 0.2 | 0.1  | 45 | 0.15 | 1.00 | 4 | 0.18 | 1.06 | 1.1  | 1.13 | 1.17 | 1.26 |
| 0.2 | 0.1  | 45 | 0.15 | 1.25 | 4 | 0.18 | 1.32 | 1.37 | 1.41 | 1.46 | 1.57 |
| 0.2 | 0.1  | 45 | 0.15 | 1.50 | 4 | 0.18 | 1.58 | 1.63 | 1.69 | 1.75 | 1.88 |
| 0.2 | 0.1  | 45 | 0.15 | 2.00 | 4 | 0.18 | 2.1  | 2.17 | 2.24 | 2.32 | 2.5  |
| 0.2 | 0.1  | 45 | 0.15 | 2.50 | 4 | 0.18 | 2.61 | 2.7  | 2.8  | 2.9  | 3.12 |
| 0.2 | 0.1  | 45 | 0.15 | 3.00 | 4 | 0.18 | 3.13 | 3.24 | 3.35 | 3.47 | 3.75 |
| 0.3 | 0.15 | 45 | 0.25 | 0.50 | 4 | 0.28 | 0.55 | 0.56 | 0.57 | 0.59 | 0.63 |
| 0.3 | 0.15 | 45 | 0.25 | 0.75 | 4 | 0.28 | 0.80 | 0.83 | 0.85 | 0.88 | 0.94 |
| 0.3 | 0.15 | 45 | 0.25 | 1.00 | 4 | 0.28 | 1.06 | 1.09 | 1.13 | 1.17 | 1.25 |
| 0.3 | 0.15 | 45 | 0.25 | 1.25 | 4 | 0.28 | 1.32 | 1.36 | 1.41 | 1.45 | 1.56 |
| 0.3 | 0.15 | 45 | 0.25 | 1.50 | 4 | 0.28 | 1.58 | 1.63 | 1.68 | 1.74 | 1.87 |
| 0.3 | 0.15 | 45 | 0.25 | 2.00 | 4 | 0.28 | 2.10 | 2.16 | 2.24 | 2.32 | 2.49 |
| 0.3 | 0.15 | 45 | 0.25 | 2.50 | 4 | 0.28 | 2.61 | 2.70 | 2.79 | 2.89 | 3.11 |
| 0.3 | 0.15 | 45 | 0.25 | 3.00 | 4 | 0.28 | 3.13 | 3.23 | 3.35 | 3.47 | 3.73 |
| 0.4 | 0.2  | 45 | 0.30 | 1.00 | 4 | 0.37 | 1.08 | 1.11 | 1.14 | 1.18 | 1.26 |
| 0.4 | 0.2  | 45 | 0.30 | 1.50 | 4 | 0.37 | 1.60 | 1.65 | 1.70 | 1.75 | 1.88 |

| 431RHP    |                               |                               |
|-----------|-------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
|           |                               | €                             |
| 438285    | 431RHP .2X.5X45X4             |                               |
| 438286    | 431RHP .2X.75X45X4            |                               |
| 438287    | 431RHP .2X1X45X4              |                               |
| 438288    | 431RHP .2X1.25X45X4           |                               |
| 438289    | 431RHP .2X1.5X45X4            |                               |
| 438290    | 431RHP .2X2X45X4              |                               |
| 438291    | 431RHP .2X2.5X45X4            |                               |
| 438292    | 431RHP .2X3X45X4              |                               |
| 438293    | 431RHP .3X.5X45X4             |                               |
| 438294    | 431RHP .3X.75X45X4            |                               |
| 437606    | 431RHP .3X1X45X4              |                               |
| 438295    | 431RHP .3X1.25X45X4           |                               |
| 438296    | 431RHP .3X1.5X45X4            |                               |
| 438297    | 431RHP .3X2X45X4              |                               |
| 438298    | 431RHP .3X2.5X45X4            |                               |
| 438299    | 431RHP .3X3X45X4              |                               |
| 438300    | 431RHP .4X1X45X4              |                               |
| 438301    | 431RHP .4X1.5X45X4            |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

Frese sferiche con scarico in metallo duro integrale micrograna.  
Ball nose long neck end mills in solid carbide micro grain.

| 431RHP                              |                                 |                                    |                                      |                                    |                                    |                                 |                                                                                                                                                            |       |       |       |       | 431RHP    |                               |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-----------|-------------------------------|-------------------------------|
| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |       |       |       | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30°                                                                                                                                                        | 1°    | 1°30' | 2°    | 3°    |           |                               | €                             |
| 0.4                                 | 0.2                             | 45                                 | 0.30                                 | 2.00                               | 4                                  | 0.37                            | 2.11                                                                                                                                                       | 2.18  | 2.25  | 2.33  | 2.50  | 437607    | 431RHP .4X2X45X4              |                               |
| 0.4                                 | 0.2                             | 45                                 | 0.30                                 | 2.50                               | 4                                  | 0.37                            | 2.63                                                                                                                                                       | 2.72  | 2.81  | 2.90  | 3.12  | 438302    | 431RHP .4X2.5X45X4            |                               |
| 0.4                                 | 0.2                             | 45                                 | 0.30                                 | 3.00                               | 4                                  | 0.37                            | 3.15                                                                                                                                                       | 3.25  | 3.36  | 3.48  | 3.75  | 437608    | 431RHP .4X3X45X4              |                               |
| 0.4                                 | 0.2                             | 45                                 | 0.30                                 | 3.50                               | 4                                  | 0.37                            | 3.66                                                                                                                                                       | 3.78  | 3.91  | 4.05  | 4.37  | 438303    | 431RHP .4X3.5X45X4            |                               |
| 0.4                                 | 0.2                             | 45                                 | 0.30                                 | 4.00                               | 4                                  | 0.37                            | 4.18                                                                                                                                                       | 4.32  | 4.47  | 4.63  | 4.99  | 438304    | 431RHP .4X4X45X4              |                               |
| 0.4                                 | 0.2                             | 45                                 | 0.30                                 | 4.50                               | 4                                  | 0.37                            | 4.70                                                                                                                                                       | 4.85  | 5.02  | 5.20  | 5.61  | 438305    | 431RHP .4X4.5X45X4            |                               |
| 0.4                                 | 0.2                             | 45                                 | 0.30                                 | 5.00                               | 4                                  | 0.37                            | 5.21                                                                                                                                                       | 5.39  | 5.58  | 5.78  | 6.23  | 438306    | 431RHP .4X5X45X4              |                               |
| 0.4                                 | 0.2                             | 45                                 | 0.30                                 | 6.00                               | 4                                  | 0.37                            | 6.25                                                                                                                                                       | 6.46  | 6.69  | 6.93  | 7.47  | 438307    | 431RHP .4X6X45X4              |                               |
| 0.4                                 | 0.2                             | 45                                 | 0.30                                 | 8.00                               | 4                                  | 0.37                            | 8.32                                                                                                                                                       | 8.60  | 8.90  | 9.23  | 9.96  | 438308    | 431RHP .4X8X45X4              |                               |
| 0.5                                 | 0.25                            | 45                                 | 0.35                                 | 1.00                               | 4                                  | 0.47                            | 1.08                                                                                                                                                       | 1.11  | 1.14  | 1.17  | 1.25  | 438309    | 431RHP .5X1X45X4              |                               |
| 0.5                                 | 0.25                            | 45                                 | 0.35                                 | 1.50                               | 4                                  | 0.47                            | 1.59                                                                                                                                                       | 1.64  | 1.69  | 1.75  | 1.87  | 438310    | 431RHP .5X1.5X45X4            |                               |
| 0.5                                 | 0.25                            | 45                                 | 0.35                                 | 2.00                               | 4                                  | 0.47                            | 2.11                                                                                                                                                       | 2.18  | 2.25  | 2.32  | 2.49  | 437609    | 431RHP .5X2X45X4              |                               |
| 0.5                                 | 0.25                            | 45                                 | 0.35                                 | 2.50                               | 4                                  | 0.47                            | 2.63                                                                                                                                                       | 2.71  | 2.80  | 2.90  | 3.11  | 438311    | 431RHP .5X2.5X45X4            |                               |
| 0.5                                 | 0.25                            | 45                                 | 0.35                                 | 3.00                               | 4                                  | 0.47                            | 3.15                                                                                                                                                       | 3.25  | 3.35  | 3.47  | 3.73  | 437610    | 431RHP .5X3X45X4              |                               |
| 0.5                                 | 0.25                            | 45                                 | 0.35                                 | 4.00                               | 4                                  | 0.47                            | 4.18                                                                                                                                                       | 4.32  | 4.46  | 4.62  | 4.98  | 437611    | 431RHP .5X4X45X4              |                               |
| 0.5                                 | 0.25                            | 45                                 | 0.35                                 | 5.00                               | 4                                  | 0.47                            | 5.21                                                                                                                                                       | 5.39  | 5.57  | 5.77  | 6.22  | 437612    | 431RHP .5X5X45X4              |                               |
| 0.5                                 | 0.25                            | 45                                 | 0.35                                 | 6.00                               | 4                                  | 0.47                            | 6.25                                                                                                                                                       | 6.46  | 6.68  | 6.92  | 7.46  | 438312    | 431RHP .5X6X45X4              |                               |
| 0.5                                 | 0.25                            | 45                                 | 0.35                                 | 8.00                               | 4                                  | 0.47                            | 8.31                                                                                                                                                       | 8.59  | 8.90  | 9.22  | 9.95  | 438313    | 431RHP .5X8X45X4              |                               |
| 0.5                                 | 0.25                            | 45                                 | 0.35                                 | 10.00                              | 4                                  | 0.47                            | 10.38                                                                                                                                                      | 10.73 | 11.11 | 11.52 | 12.44 | 438314    | 431RHP .5X10X45X4             |                               |
| 0.6                                 | 0.3                             | 45                                 | 0.40                                 | 1.00                               | 4                                  | 0.57                            | 1.08                                                                                                                                                       | 1.10  | 1.13  | 1.16  | 1.23  | 438315    | 431RHP .6X1X45X4              |                               |
| 0.6                                 | 0.3                             | 45                                 | 0.40                                 | 2.00                               | 4                                  | 0.57                            | 2.11                                                                                                                                                       | 2.17  | 2.24  | 2.31  | 2.48  | 438316    | 431RHP .6X2X45X4              |                               |
| 0.6                                 | 0.3                             | 45                                 | 0.40                                 | 2.50                               | 4                                  | 0.57                            | 2.63                                                                                                                                                       | 2.71  | 2.80  | 2.89  | 3.10  | 438317    | 431RHP .6X2.5X45X4            |                               |
| 0.6                                 | 0.3                             | 45                                 | 0.40                                 | 3.00                               | 4                                  | 0.57                            | 3.14                                                                                                                                                       | 3.24  | 3.35  | 3.46  | 3.72  | 437613    | 431RHP .6X3X45X4              |                               |
| 0.6                                 | 0.3                             | 45                                 | 0.40                                 | 3.50                               | 4                                  | 0.57                            | 3.66                                                                                                                                                       | 3.78  | 3.90  | 4.04  | 4.34  | 438318    | 431RHP .6X3.5X45X4            |                               |
| 0.6                                 | 0.3                             | 45                                 | 0.40                                 | 4.00                               | 4                                  | 0.57                            | 4.18                                                                                                                                                       | 4.31  | 4.46  | 4.61  | 4.96  | 437614    | 431RHP .6X4X45X4              |                               |
| 0.6                                 | 0.3                             | 45                                 | 0.40                                 | 4.50                               | 4                                  | 0.57                            | 4.69                                                                                                                                                       | 4.85  | 5.01  | 5.19  | 5.59  | 438319    | 431RHP .6X4.5X45X4            |                               |
| 0.6                                 | 0.3                             | 45                                 | 0.40                                 | 5.00                               | 4                                  | 0.57                            | 5.21                                                                                                                                                       | 5.38  | 5.57  | 5.76  | 6.21  | 437615    | 431RHP .6X5X45X4              |                               |
| 0.6                                 | 0.3                             | 45                                 | 0.40                                 | 5.50                               | 4                                  | 0.57                            | 5.73                                                                                                                                                       | 5.92  | 6.12  | 6.34  | 6.83  | 438320    | 431RHP .6X5.5X45X4            |                               |
| 0.6                                 | 0.3                             | 45                                 | 0.40                                 | 6.00                               | 4                                  | 0.57                            | 6.24                                                                                                                                                       | 6.45  | 6.67  | 6.91  | 7.45  | 437616    | 431RHP .6X6X45X4              |                               |
| 0.6                                 | 0.3                             | 45                                 | 0.40                                 | 8.00                               | 4                                  | 0.57                            | 8.31                                                                                                                                                       | 8.59  | 8.89  | 9.21  | 9.94  | 437617    | 431RHP .6X8X45X4              |                               |
| 0.6                                 | 0.3                             | 45                                 | 0.40                                 | 10.00                              | 4                                  | 0.57                            | 10.38                                                                                                                                                      | 10.73 | 11.11 | 11.51 | 12.42 | 438321    | 431RHP .6X10X45X4             |                               |
| 0.6                                 | 0.3                             | 45                                 | 0.40                                 | 12.00                              | 4                                  | 0.57                            | 12.45                                                                                                                                                      | 12.87 | 13.32 | 13.81 | 14.91 | 438322    | 431RHP .6X12X45X4             |                               |
| 0.7                                 | 0.35                            | 45                                 | 0.45                                 | 2.00                               | 4                                  | 0.66                            | 2.13                                                                                                                                                       | 2.19  | 2.26  | 2.33  | 2.49  | 438323    | 431RHP .7X2X45X4              |                               |
| 0.7                                 | 0.35                            | 45                                 | 0.45                                 | 4.00                               | 4                                  | 0.66                            | 4.20                                                                                                                                                       | 4.33  | 4.47  | 4.63  | 4.98  | 438324    | 431RHP .7X4X45X4              |                               |
| 0.7                                 | 0.35                            | 45                                 | 0.45                                 | 6.00                               | 4                                  | 0.66                            | 6.26                                                                                                                                                       | 6.47  | 6.69  | 6.93  | 7.46  | 438325    | 431RHP .7X6X45X4              |                               |
| 0.7                                 | 0.35                            | 45                                 | 0.45                                 | 8.00                               | 4                                  | 0.66                            | 8.33                                                                                                                                                       | 8.61  | 8.91  | 9.23  | 9.95  | 438326    | 431RHP .7X8X45X4              |                               |
| 0.8                                 | 0.4                             | 45                                 | 0.50                                 | 2.00                               | 4                                  | 0.77                            | 2.11                                                                                                                                                       | 2.17  | 2.23  | 2.30  | 2.45  | 437618    | 431RHP .8X2X45X4              |                               |
| 0.8                                 | 0.4                             | 45                                 | 0.50                                 | 3.00                               | 4                                  | 0.77                            | 3.14                                                                                                                                                       | 3.24  | 3.34  | 3.45  | 3.70  | 438327    | 431RHP .8X3X45X4              |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

|                                     |                                 |                                    |                                      |                                    |                                    |                                 |                                                                                                                                                            |       |       |       |       | 431RHP    |                               |                                                                                     |  |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-----------|-------------------------------|-------------------------------------------------------------------------------------|--|-------------------------------|
| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |       |       |       | ART. NUM. | Codice d'ordine<br>Order code |  |  | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30'                                                                                                                                                        | 1°    | 1°30' | 2°    | 3°    |           |                               |                                                                                     |  | €                             |
| 0.8                                 | 0.4                             | 45                                 | 0.50                                 | 4.00                               | 4                                  | 0.77                            | 4.17                                                                                                                                                       | 4.31  | 4.45  | 4.60  | 4.94  | 437619    | 431RHP .8X4X45X4              |                                                                                     |  |                               |
| 0.8                                 | 0.4                             | 45                                 | 0.50                                 | 5.00                               | 4                                  | 0.77                            | 5.21                                                                                                                                                       | 5.38  | 5.56  | 5.75  | 6.18  | 438328    | 431RHP .8X5X45X4              |                                                                                     |  |                               |
| 0.8                                 | 0.4                             | 45                                 | 0.50                                 | 6.00                               | 4                                  | 0.77                            | 6.24                                                                                                                                                       | 6.45  | 6.66  | 6.90  | 7.43  | 437620    | 431RHP .8X6X45X4              |                                                                                     |  |                               |
| 0.8                                 | 0.4                             | 45                                 | 0.50                                 | 8.00                               | 4                                  | 0.77                            | 8.31                                                                                                                                                       | 8.58  | 8.88  | 9.20  | 9.91  | 437621    | 431RHP .8X8X45X4              |                                                                                     |  |                               |
| 0.8                                 | 0.4                             | 45                                 | 0.50                                 | 10.00                              | 4                                  | 0.77                            | 10.38                                                                                                                                                      | 10.72 | 11.10 | 11.50 | 12.40 | 438329    | 431RHP .8X10X45X4             |                                                                                     |  |                               |
| 0.8                                 | 0.4                             | 45                                 | 0.50                                 | 12.00                              | 4                                  | 0.77                            | 12.44                                                                                                                                                      | 12.86 | 13.31 | 13.80 | 14.89 | 438330    | 431RHP .8X12X45X4             |                                                                                     |  |                               |
| 0.9                                 | 0.45                            | 45                                 | 0.60                                 | 2.00                               | 4                                  | 0.85                            | 2.14                                                                                                                                                       | 2.20  | 2.27  | 2.33  | 2.49  | 438331    | 431RHP .9X2X45X4              |                                                                                     |  |                               |
| 0.9                                 | 0.45                            | 45                                 | 0.60                                 | 4.00                               | 4                                  | 0.85                            | 4.21                                                                                                                                                       | 4.34  | 4.48  | 4.63  | 4.97  | 438332    | 431RHP .9X4X45X4              |                                                                                     |  |                               |
| 0.9                                 | 0.45                            | 45                                 | 0.60                                 | 6.00                               | 4                                  | 0.85                            | 6.28                                                                                                                                                       | 6.48  | 6.70  | 6.93  | 7.46  | 438333    | 431RHP .9X6X45X4              |                                                                                     |  |                               |
| 0.9                                 | 0.45                            | 45                                 | 0.60                                 | 8.00                               | 4                                  | 0.85                            | 8.35                                                                                                                                                       | 8.62  | 8.92  | 9.23  | 9.95  | 438334    | 431RHP .9X8X45X4              |                                                                                     |  |                               |
| 0.9                                 | 0.45                            | 45                                 | 0.60                                 | 10.00                              | 4                                  | 0.85                            | 10.41                                                                                                                                                      | 10.76 | 11.13 | 11.53 | 12.43 | 438335    | 431RHP .9X10X45X4             |                                                                                     |  |                               |
| 1                                   | 0.5                             | 45                                 | 0.80                                 | 2.00                               | 4                                  | 0.95                            | 2.14                                                                                                                                                       | 2.20  | 2.26  | 2.33  | 2.48  | 438336    | 431RHP 1X2X45X4               |                                                                                     |  |                               |
| 1                                   | 0.5                             | 45                                 | 0.80                                 | 3.00                               | 4                                  | 0.95                            | 3.18                                                                                                                                                       | 3.27  | 3.37  | 3.48  | 3.72  | 437622    | 431RHP 1X3X45X4               |                                                                                     |  |                               |
| 1                                   | 0.5                             | 45                                 | 0.80                                 | 4.00                               | 4                                  | 0.95                            | 4.21                                                                                                                                                       | 4.34  | 4.48  | 4.63  | 4.96  | 437623    | 431RHP 1X4X45X4               |                                                                                     |  |                               |
| 1                                   | 0.5                             | 50                                 | 0.80                                 | 4.00                               | 6                                  | 0.95                            | 4.21                                                                                                                                                       | 4.34  | 4.48  | 4.63  | 4.96  | 438337    | 431RHP 1X4X50X6               |                                                                                     |  |                               |
| 1                                   | 0.5                             | 45                                 | 0.80                                 | 5.00                               | 4                                  | 0.95                            | 5.24                                                                                                                                                       | 5.41  | 5.59  | 5.78  | 6.21  | 438338    | 431RHP 1X5X45X4               |                                                                                     |  |                               |
| 1                                   | 0.5                             | 45                                 | 0.80                                 | 6.00                               | 4                                  | 0.95                            | 6.28                                                                                                                                                       | 6.48  | 6.69  | 6.93  | 7.45  | 437624    | 431RHP 1X6X45X4               |                                                                                     |  |                               |
| 1                                   | 0.5                             | 50                                 | 0.80                                 | 6.00                               | 6                                  | 0.95                            | 6.28                                                                                                                                                       | 6.48  | 6.69  | 6.93  | 7.45  | 438339    | 431RHP 1X6X50X6               |                                                                                     |  |                               |
| 1                                   | 0.5                             | 45                                 | 0.80                                 | 8.00                               | 4                                  | 0.95                            | 8.34                                                                                                                                                       | 8.62  | 8.91  | 9.23  | 9.93  | 437625    | 431RHP 1X8X45X4               |                                                                                     |  |                               |
| 1                                   | 0.5                             | 50                                 | 0.80                                 | 8.00                               | 6                                  | 0.95                            | 8.34                                                                                                                                                       | 8.62  | 8.91  | 9.23  | 9.93  | 438340    | 431RHP 1X8X50X6               |                                                                                     |  |                               |
| 1                                   | 0.5                             | 45                                 | 0.80                                 | 10.00                              | 4                                  | 0.95                            | 10.41                                                                                                                                                      | 10.76 | 11.13 | 11.53 | 12.42 | 437626    | 431RHP 1X10X45X4              |                                                                                     |  |                               |
| 1                                   | 0.5                             | 50                                 | 0.80                                 | 10.00                              | 6                                  | 0.95                            | 10.41                                                                                                                                                      | 10.76 | 11.13 | 11.53 | 12.42 | 437627    | 431RHP 1X10X50X6              |                                                                                     |  |                               |
| 1                                   | 0.5                             | 45                                 | 0.80                                 | 12.00                              | 4                                  | 0.95                            | 12.48                                                                                                                                                      | 12.90 | 13.34 | 13.83 | 14.91 | 437628    | 431RHP 1X12X45X4              |                                                                                     |  |                               |
| 1                                   | 0.5                             | 50                                 | 0.80                                 | 12.00                              | 6                                  | 0.95                            | 12.48                                                                                                                                                      | 12.90 | 13.34 | 13.83 | 14.91 | 438341    | 431RHP 1X12X50X6              |                                                                                     |  |                               |
| 1                                   | 0.5                             | 45                                 | 0.80                                 | 14.00                              | 4                                  | 0.95                            | 14.55                                                                                                                                                      | 15.04 | 15.56 | 16.13 | 17.39 | 438342    | 431RHP 1X14X45X4              |                                                                                     |  |                               |
| 1                                   | 0.5                             | 50                                 | 0.80                                 | 16.00                              | 4                                  | 0.95                            | 16.61                                                                                                                                                      | 17.17 | 17.78 | 18.43 | 19.88 | 437629    | 431RHP 1X16X50X4              |                                                                                     |  |                               |
| 1                                   | 0.5                             | 60                                 | 0.80                                 | 16.00                              | 6                                  | 0.95                            | 16.61                                                                                                                                                      | 17.17 | 17.78 | 18.43 | 19.88 | 437630    | 431RHP 1X16X60X6              |                                                                                     |  |                               |
| 1                                   | 0.5                             | 50                                 | 0.80                                 | 18.00                              | 4                                  | 0.95                            | 18.68                                                                                                                                                      | 19.31 | 19.99 | 20.72 | 22.37 | 438343    | 431RHP 1X18X50X4              |                                                                                     |  |                               |
| 1                                   | 0.5                             | 50                                 | 0.80                                 | 20.00                              | 4                                  | 0.95                            | 20.75                                                                                                                                                      | 21.45 | 22.21 | 23.02 | 24.85 | 438344    | 431RHP 1X20X50X4              |                                                                                     |  |                               |
| 1                                   | 0.5                             | 60                                 | 0.80                                 | 20.00                              | 6                                  | 0.95                            | 20.75                                                                                                                                                      | 21.45 | 22.21 | 23.02 | 24.85 | 438345    | 431RHP 1X20X60X6              |                                                                                     |  |                               |
| 1.2                                 | 0.6                             | 45                                 | 1.20                                 | 4.00                               | 4                                  | 1.14                            | 4.23                                                                                                                                                       | 4.35  | 4.49  | 4.63  | 4.96  | 437631    | 431RHP 1.2X4X45X4             |                                                                                     |  |                               |
| 1.2                                 | 0.6                             | 45                                 | 1.20                                 | 6.00                               | 4                                  | 1.14                            | 6.29                                                                                                                                                       | 6.49  | 6.70  | 6.93  | 7.45  | 438346    | 431RHP 1.2X6X45X4             |                                                                                     |  |                               |
| 1.2                                 | 0.6                             | 45                                 | 1.20                                 | 8.00                               | 4                                  | 1.14                            | 8.36                                                                                                                                                       | 8.63  | 8.92  | 9.23  | 9.93  | 437632    | 431RHP 1.2X8X45X4             |                                                                                     |  |                               |
| 1.2                                 | 0.6                             | 45                                 | 1.20                                 | 10.00                              | 4                                  | 1.14                            | 10.43                                                                                                                                                      | 10.77 | 11.14 | 11.53 | 12.42 | 438347    | 431RHP 1.2X10X45X4            |                                                                                     |  |                               |
| 1.2                                 | 0.6                             | 45                                 | 1.20                                 | 12.00                              | 4                                  | 1.14                            | 12.49                                                                                                                                                      | 12.91 | 13.35 | 13.83 | 14.91 | 438348    | 431RHP 1.2X12X45X4            |                                                                                     |  |                               |
| 1.2                                 | 0.6                             | 50                                 | 1.20                                 | 16.00                              | 4                                  | 1.14                            | 16.63                                                                                                                                                      | 17.19 | 17.79 | 18.43 | 19.88 | 438349    | 431RHP 1.2X16X50X4            |                                                                                     |  |                               |
| 1.2                                 | 0.6                             | 50                                 | 1.20                                 | 20.00                              | 4                                  | 1.14                            | 20.76                                                                                                                                                      | 21.47 | 22.22 | 23.03 | 24.85 | 438350    | 431RHP 1.2X20X50X4            |                                                                                     |  |                               |
| 1.5                                 | 0.75                            | 45                                 | 1.35                                 | 3.00                               | 4                                  | 1.44                            | 3.19                                                                                                                                                       | 3.27  | 3.36  | 3.46  | 3.68  | 438351    | 431RHP 1.5X3X45X4             |                                                                                     |  |                               |
| 1.5                                 | 0.75                            | 45                                 | 1.35                                 | 4.00                               | 4                                  | 1.44                            | 4.22                                                                                                                                                       | 4.34  | 4.47  | 4.61  | 4.92  | 437633    | 431RHP 1.5X4X45X4             |                                                                                     |  |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page &gt;&gt;

Frese sferiche con scarico in metallo duro integrale micrograna.  
Ball nose long neck end mills in solid carbide micro grain.

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |    |       |    |    |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-------|----|----|
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30°                                                                                                                                                        | 1° | 1°30' | 2° | 3° |

| 431RHP    |                               |                                                                                     |                               |
|-----------|-------------------------------|-------------------------------------------------------------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code |  | Prezzo utensile<br>Tool Price |
|           |                               |                                                                                     | €                             |

|     |      |    |      |       |   |      |       |       |       |       |        |
|-----|------|----|------|-------|---|------|-------|-------|-------|-------|--------|
| 1.5 | 0.75 | 50 | 1.35 | 4.00  | 6 | 1.44 | 4.22  | 4.34  | 4.47  | 4.61  | 4.92   |
| 1.5 | 0.75 | 45 | 1.35 | 6.00  | 4 | 1.44 | 6.29  | 6.48  | 6.69  | 6.91  | 7.41   |
| 1.5 | 0.75 | 50 | 1.35 | 6.00  | 6 | 1.44 | 6.29  | 6.48  | 6.69  | 6.91  | 7.41   |
| 1.5 | 0.75 | 45 | 1.35 | 8.00  | 4 | 1.44 | 8.35  | 8.62  | 8.90  | 9.21  | 9.90   |
| 1.5 | 0.75 | 50 | 1.35 | 8.00  | 6 | 1.44 | 8.35  | 8.62  | 8.90  | 9.21  | 9.90   |
| 1.5 | 0.75 | 45 | 1.35 | 10.00 | 4 | 1.44 | 10.42 | 10.76 | 11.12 | 11.51 | 12.38  |
| 1.5 | 0.75 | 50 | 1.35 | 10.00 | 6 | 1.44 | 10.42 | 10.76 | 11.12 | 11.51 | 12.38  |
| 1.5 | 0.75 | 45 | 1.35 | 12.00 | 4 | 1.44 | 12.49 | 12.90 | 13.34 | 13.81 | 14.87  |
| 1.5 | 0.75 | 50 | 1.35 | 12.00 | 6 | 1.44 | 12.49 | 12.90 | 13.34 | 13.81 | 14.87  |
| 1.5 | 0.75 | 45 | 1.35 | 14.00 | 4 | 1.44 | 14.56 | 15.04 | 15.55 | 16.11 | 17.36  |
| 1.5 | 0.75 | 50 | 1.35 | 16.00 | 4 | 1.44 | 16.62 | 17.18 | 17.77 | 18.41 | 19.84  |
| 1.5 | 0.75 | 60 | 1.35 | 16.00 | 6 | 1.44 | 16.62 | 17.18 | 17.77 | 18.41 | 19.84  |
| 1.5 | 0.75 | 50 | 1.35 | 20.00 | 4 | 1.44 | 20.76 | 21.46 | 22.20 | 23.01 | libero |
| 1.5 | 0.75 | 60 | 1.35 | 20.00 | 6 | 1.44 | 20.76 | 21.46 | 22.20 | 23.01 | 24.81  |
| 1.5 | 0.75 | 60 | 1.35 | 25.00 | 4 | 1.44 | 25.93 | 26.80 | 27.75 | 28.76 | libero |
| 1.5 | 0.75 | 70 | 1.35 | 30.00 | 4 | 1.44 | 31.10 | 32.15 | 33.29 | 34.51 | libero |
| 1.6 | 0.8  | 45 | 1.60 | 6.00  | 4 | 1.55 | 6.27  | 6.46  | 6.66  | 6.88  | 7.38   |
| 1.6 | 0.8  | 45 | 1.60 | 8.00  | 4 | 1.55 | 8.33  | 8.60  | 8.88  | 9.18  | 9.86   |
| 1.6 | 0.8  | 45 | 1.60 | 10.00 | 4 | 1.55 | 10.40 | 10.74 | 11.09 | 11.48 | 12.35  |
| 1.6 | 0.8  | 45 | 1.60 | 12.00 | 4 | 1.55 | 12.47 | 12.88 | 13.31 | 13.78 | 14.83  |
| 1.6 | 0.8  | 50 | 1.60 | 16.00 | 4 | 1.55 | 16.60 | 17.15 | 17.74 | 18.38 | 19.81  |
| 1.6 | 0.8  | 50 | 1.60 | 20.00 | 4 | 1.55 | 20.74 | 21.43 | 22.18 | 22.98 | libero |
| 2   | 1.0  | 45 | 1.80 | 4.00  | 4 | 1.92 | 4.25  | 4.36  | 4.49  | 4.62  | 4.91   |
| 2   | 1.0  | 45 | 1.80 | 6.00  | 4 | 1.92 | 6.32  | 6.50  | 6.70  | 6.92  | 7.40   |
| 2   | 1.0  | 50 | 1.80 | 6.00  | 6 | 1.92 | 6.32  | 6.50  | 6.70  | 6.92  | 7.40   |
| 2   | 1.0  | 45 | 1.80 | 8.00  | 4 | 1.92 | 8.38  | 8.64  | 8.92  | 9.22  | 9.88   |
| 2   | 1.0  | 50 | 1.80 | 8.00  | 6 | 1.92 | 8.38  | 8.64  | 8.92  | 9.22  | 9.88   |
| 2   | 1.0  | 45 | 1.80 | 10.00 | 4 | 1.92 | 10.45 | 10.78 | 11.14 | 11.52 | 12.37  |
| 2   | 1.0  | 50 | 1.80 | 10.00 | 6 | 1.92 | 10.45 | 10.78 | 11.14 | 11.52 | 12.37  |
| 2   | 1.0  | 45 | 1.80 | 12.00 | 4 | 1.92 | 12.52 | 12.92 | 13.35 | 13.82 | 14.86  |
| 2   | 1.0  | 50 | 1.80 | 12.00 | 6 | 1.92 | 12.52 | 12.92 | 13.35 | 13.82 | 14.86  |
| 2   | 1.0  | 45 | 1.80 | 14.00 | 4 | 1.92 | 14.59 | 15.06 | 15.57 | 16.11 | 17.34  |
| 2   | 1.0  | 50 | 1.80 | 16.00 | 4 | 1.92 | 16.65 | 17.20 | 17.79 | 18.41 | 19.83  |
| 2   | 1.0  | 60 | 1.80 | 16.00 | 6 | 1.92 | 16.65 | 17.20 | 17.79 | 18.41 | 19.83  |
| 2   | 1.0  | 50 | 1.80 | 18.00 | 4 | 1.92 | 18.72 | 19.34 | 20.00 | 20.71 | libero |
| 2   | 1.0  | 50 | 1.80 | 20.00 | 4 | 1.92 | 20.79 | 21.48 | 22.22 | 23.01 | libero |
| 2   | 1.0  | 60 | 1.80 | 20.00 | 6 | 1.92 | 20.79 | 21.48 | 22.22 | 23.01 | 24.80  |
| 2   | 1.0  | 60 | 1.80 | 25.00 | 4 | 1.92 | 25.96 | 26.83 | 27.76 | 28.76 | libero |
| 2   | 1.0  | 60 | 1.80 | 25.00 | 6 | 1.92 | 25.96 | 26.83 | 27.76 | 28.76 | 31.02  |

|        |        |             |
|--------|--------|-------------|
| 438352 | 431RHP | 1.5X4X50X6  |
| 437634 | 431RHP | 1.5X6X45X4  |
| 438353 | 431RHP | 1.5X6X50X6  |
| 437635 | 431RHP | 1.5X8X45X4  |
| 438354 | 431RHP | 1.5X8X50X6  |
| 437636 | 431RHP | 1.5X10X45X4 |
| 437637 | 431RHP | 1.5X10X50X6 |
| 437638 | 431RHP | 1.5X12X45X4 |
| 438355 | 431RHP | 1.5X12X50X6 |
| 438356 | 431RHP | 1.5X14X45X4 |
| 438357 | 431RHP | 1.5X16X50X4 |
| 438358 | 431RHP | 1.5X16X60X6 |
| 437639 | 431RHP | 1.5X20X50X4 |
| 437640 | 431RHP | 1.5X20X60X6 |
| 438359 | 431RHP | 1.5X25X60X4 |
| 438360 | 431RHP | 1.5X30X70X4 |
| 438361 | 431RHP | 1.6X6X45X4  |
| 438362 | 431RHP | 1.6X8X45X4  |
| 438363 | 431RHP | 1.6X10X45X4 |
| 438364 | 431RHP | 1.6X12X45X4 |
| 438365 | 431RHP | 1.6X16X50X4 |
| 438366 | 431RHP | 1.6X20X50X4 |
| 438367 | 431RHP | 2X4X45X4    |
| 437641 | 431RHP | 2X6X45X4    |
| 437642 | 431RHP | 2X6X50X6    |
| 437643 | 431RHP | 2X8X45X4    |
| 438654 | 431RHP | 2X8X50X6    |
| 437644 | 431RHP | 2X10X45X4   |
| 437645 | 431RHP | 2X10X50X6   |
| 437646 | 431RHP | 2X12X45X4   |
| 437647 | 431RHP | 2X12X50X6   |
| 437648 | 431RHP | 2X14X45X4   |
| 437649 | 431RHP | 2X16X50X4   |
| 437650 | 431RHP | 2X16X60X6   |
| 438368 | 431RHP | 2X18X50X4   |
| 437651 | 431RHP | 2X20X50X4   |
| 437652 | 431RHP | 2X20X60X6   |
| 438369 | 431RHP | 2X25X60X4   |
| 438370 | 431RHP | 2X25X60X6   |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |    |       |    |    |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-------|----|----|
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30'                                                                                                                                                        | 1° | 1°30' | 2° | 3° |

| 431RHP    |                               |                                                                                     |                               |
|-----------|-------------------------------|-------------------------------------------------------------------------------------|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code |  | Prezzo utensile<br>Tool Price |
|           |                               |                                                                                     | €                             |

|     |      |     |      |       |   |      |        |        |        |        |        |
|-----|------|-----|------|-------|---|------|--------|--------|--------|--------|--------|
| 2   | 1.0  | 70  | 1.80 | 30.00 | 4 | 1.92 | 31.13  | 32.18  | 33.30  | libero | libero |
| 2   | 1.0  | 70  | 1.80 | 35.00 | 4 | 1.92 | 36.29  | 37.52  | 38.84  | libero | libero |
| 2   | 1.0  | 80  | 1.80 | 40.00 | 4 | 1.92 | 41.46  | 42.87  | libero | libero | libero |
| 2.5 | 1.25 | 45  | 2.50 | 8.00  | 4 | 2.39 | 8.43   | 8.68   | 8.95   | 9.24   | 9.89   |
| 2.5 | 1.25 | 45  | 2.50 | 10.00 | 4 | 2.39 | 10.50  | 10.82  | 11.17  | 11.54  | 12.38  |
| 2.5 | 1.25 | 45  | 2.50 | 12.00 | 4 | 2.39 | 12.57  | 12.96  | 13.39  | 13.84  | 14.86  |
| 2.5 | 1.25 | 50  | 2.50 | 16.00 | 4 | 2.39 | 16.70  | 17.24  | 17.82  | 18.44  | libero |
| 2.5 | 1.25 | 50  | 2.50 | 20.00 | 4 | 2.39 | 20.84  | 21.52  | 22.25  | libero | libero |
| 2.5 | 1.25 | 60  | 2.50 | 25.00 | 4 | 2.39 | 26.01  | 26.87  | 27.79  | libero | libero |
| 3   | 1.5  | 50  | 3.00 | 6.00  | 6 | 2.86 | 6.42   | 6.59   | 6.77   | 6.97   | 7.41   |
| 3   | 1.5  | 50  | 3.00 | 8.00  | 6 | 2.86 | 8.48   | 8.73   | 8.99   | 9.27   | 9.90   |
| 3   | 1.5  | 50  | 3.00 | 10.00 | 6 | 2.86 | 10.55  | 10.87  | 11.21  | 11.57  | 12.39  |
| 3   | 1.5  | 50  | 3.00 | 12.00 | 6 | 2.86 | 12.62  | 13.01  | 13.42  | 13.87  | 14.87  |
| 3   | 1.5  | 50  | 3.00 | 14.00 | 6 | 2.86 | 14.69  | 15.15  | 15.64  | 16.17  | 17.36  |
| 3   | 1.5  | 60  | 3.00 | 16.00 | 6 | 2.86 | 16.75  | 17.28  | 17.86  | 18.47  | 19.85  |
| 3   | 1.5  | 60  | 3.00 | 18.00 | 6 | 2.86 | 18.82  | 19.42  | 20.07  | 20.77  | 22.33  |
| 3   | 1.5  | 60  | 3.00 | 20.00 | 6 | 2.86 | 20.89  | 21.56  | 22.29  | 23.07  | 24.82  |
| 3   | 1.5  | 60  | 3.00 | 25.00 | 6 | 2.86 | 26.06  | 26.91  | 27.83  | 28.82  | libero |
| 3   | 1.5  | 70  | 3.00 | 30.00 | 6 | 2.86 | 31.22  | 32.26  | 33.37  | 34.57  | libero |
| 3   | 1.5  | 70  | 3.00 | 35.00 | 6 | 2.86 | 36.39  | 37.61  | 38.91  | 40.32  | libero |
| 3   | 1.5  | 80  | 3.00 | 40.00 | 6 | 2.86 | 41.56  | 42.96  | 44.45  | libero | libero |
| 3   | 1.5  | 100 | 3.00 | 50.00 | 6 | 2.86 | 51.90  | 53.65  | 55.54  | libero | libero |
| 3.5 | 1.75 | 60  | 3.50 | 15.00 | 6 | 3.35 | 15.73  | 16.22  | 16.74  | 17.30  | 18.56  |
| 3.5 | 1.75 | 60  | 3.50 | 20.00 | 6 | 3.35 | 20.90  | 21.57  | 22.28  | 23.05  | 24.78  |
| 3.5 | 1.75 | 60  | 3.50 | 25.00 | 6 | 3.35 | 26.07  | 26.91  | 27.82  | 28.80  | libero |
| 3.5 | 1.75 | 70  | 3.50 | 30.00 | 6 | 3.35 | 31.24  | 32.26  | 33.37  | 34.55  | libero |
| 3.5 | 1.75 | 80  | 3.50 | 40.00 | 6 | 3.35 | 41.57  | 42.96  | 44.45  | libero | libero |
| 4   | 2.0  | 50  | 4.00 | 10.00 | 6 | 3.80 | 10.65  | 10.95  | 11.28  | 11.62  | 12.40  |
| 4   | 2.0  | 50  | 4.00 | 12.00 | 6 | 3.80 | 12.72  | 13.09  | 13.49  | 13.92  | 14.89  |
| 4   | 2.0  | 60  | 4.00 | 16.00 | 6 | 3.80 | 16.85  | 17.37  | 17.93  | 18.52  | 19.86  |
| 4   | 2.0  | 60  | 4.00 | 20.00 | 6 | 3.80 | 20.99  | 21.65  | 22.36  | 23.12  | libero |
| 4   | 2.0  | 60  | 4.00 | 25.00 | 6 | 3.80 | 26.16  | 27.00  | 27.90  | 28.87  | libero |
| 4   | 2.0  | 70  | 4.00 | 30.00 | 6 | 3.80 | 31.32  | 32.35  | 33.44  | libero | libero |
| 4   | 2.0  | 70  | 4.00 | 35.00 | 6 | 3.80 | 36.49  | 37.69  | 38.98  | libero | libero |
| 4   | 2.0  | 80  | 4.00 | 40.00 | 6 | 3.80 | 41.66  | 43.04  | libero | libero | libero |
| 4   | 2.0  | 100 | 4.00 | 50.00 | 6 | 3.80 | 52.00  | 53.74  | libero | libero | libero |
| 6   | 3.0  | 60  | 7.00 | 15.00 | 6 | 5.70 | libero | libero | libero | libero | libero |
| 6   | 3.0  | 60  | 7.00 | 20.00 | 6 | 5.70 | libero | libero | libero | libero | libero |
| 6   | 3.0  | 70  | 7.00 | 30.00 | 6 | 5.70 | libero | libero | libero | libero | libero |

|        |        |             |
|--------|--------|-------------|
| 437653 | 431RHP | 2X30X70X4   |
| 438371 | 431RHP | 2X35X70X4   |
| 438372 | 431RHP | 2X40X80X4   |
| 438373 | 431RHP | 2.5X8X45X4  |
| 437654 | 431RHP | 2.5X10X45X4 |
| 438374 | 431RHP | 2.5X12X45X4 |
| 438375 | 431RHP | 2.5X16X50X4 |
| 437655 | 431RHP | 2.5X20X50X4 |
| 438376 | 431RHP | 2.5X25X60X4 |
| 438377 | 431RHP | 3X6X50X6    |
| 438378 | 431RHP | 3X8X50X6    |
| 437656 | 431RHP | 3X10X50X6   |
| 437657 | 431RHP | 3X12X50X6   |
| 438379 | 431RHP | 3X14X50X6   |
| 437658 | 431RHP | 3X16X60X6   |
| 438380 | 431RHP | 3X18X60X6   |
| 437659 | 431RHP | 3X20X60X6   |
| 437660 | 431RHP | 3X25X60X6   |
| 437661 | 431RHP | 3X30X70X6   |
| 438381 | 431RHP | 3X35X70X6   |
| 438382 | 431RHP | 3X40X80X6   |
| 438383 | 431RHP | 3X50X100X6  |
| 438384 | 431RHP | 3.5X15X60X6 |
| 438385 | 431RHP | 3.5X20X60X6 |
| 438386 | 431RHP | 3.5X25X60X6 |
| 438387 | 431RHP | 3.5X30X70X6 |
| 438388 | 431RHP | 3.5X40X80X6 |
| 437662 | 431RHP | 4X10X50X6   |
| 437663 | 431RHP | 4X12X50X6   |
| 437664 | 431RHP | 4X16X60X6   |
| 437665 | 431RHP | 4X20X60X6   |
| 437666 | 431RHP | 4X25X60X6   |
| 437667 | 431RHP | 4X30X70X6   |
| 438389 | 431RHP | 4X35X70X6   |
| 438390 | 431RHP | 4X40X80X6   |
| 438391 | 431RHP | 4X50X100X6  |
| 438392 | 431RHP | 6X15X60X6   |
| 438393 | 431RHP | 6X20X60X6   |
| 438394 | 431RHP | 6X30X70X6   |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

Frese sferiche con scarico in metallo duro integrale micrograna.  
Ball nose long neck end mills in solid carbide micro grain.

| 431RHP                              |                                 |                                    |                                      |                                    |                                    |                                 |                                                                                                                                                            |        |        |        |        | 431RHP    |                               |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--------|--------|-----------|-------------------------------|-------------------------------|
| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |        |        |        |        | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | 30°                                                                                                                                                        | 1°     | 1°30'  | 2°     | 3°     |           |                               | €                             |
| 8                                   | 4.0                             | 60                                 | 10.00                                | 20.00                              | 8                                  | 7.60                            | libero                                                                                                                                                     | libero | libero | libero | libero | 437668    | 431RHP 8X20X60X8              |                               |
| 8                                   | 4.0                             | 60                                 | 10.00                                | 25.00                              | 8                                  | 7.60                            | libero                                                                                                                                                     | libero | libero | libero | libero | 437669    | 431RHP 8X25X60X8              |                               |
| 8                                   | 4.0                             | 100                                | 10.00                                | 30.00                              | 8                                  | 7.60                            | libero                                                                                                                                                     | libero | libero | libero | libero | 437670    | 431RHP 8X30X100X8             |                               |
| 10                                  | 5.0                             | 70                                 | 12.00                                | 25.00                              | 10                                 | 9.50                            | libero                                                                                                                                                     | libero | libero | libero | libero | 438395    | 431RHP 10X25X70X10            |                               |
| 10                                  | 5.0                             | 70                                 | 12.00                                | 30.00                              | 10                                 | 9.50                            | libero                                                                                                                                                     | libero | libero | libero | libero | 437671    | 431RHP 10X30X70X10            |                               |
| 10                                  | 5.0                             | 100                                | 12.00                                | 35.00                              | 10                                 | 9.50                            | libero                                                                                                                                                     | libero | libero | libero | libero | 438396    | 431RHP 10X35X100X10           |                               |
| 12                                  | 6.0                             | 80                                 | 14.00                                | 30.00                              | 12                                 | 11.50                           | libero                                                                                                                                                     | libero | libero | libero | libero | 438397    | 431RHP 12X30X80X12            |                               |
| 12                                  | 6.0                             | 110                                | 14.00                                | 40.00                              | 12                                 | 11.50                           | libero                                                                                                                                                     | libero | libero | libero | libero | 438398    | 431RHP 12X40X110X12           |                               |

Frese sferiche con scarico conico in metallo duro integrale micrograna.  
Ball nose tapered neck end mills in solid carbide micro grain.

|  |  |   |  |   |
|--|--|---|--|---|
|  |  |   |  | - |
|  |  | - |  |   |

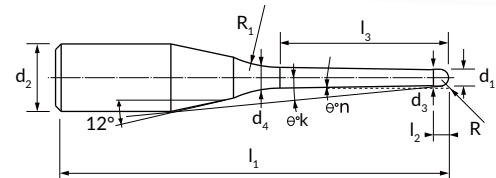
#### Operazioni di fresatura | Milling strategies:

|   |   |   |   |  |   |
|---|---|---|---|--|---|
| - | - | - | - |  | - |
|---|---|---|---|--|---|

#### Gruppo materiali lavorabili | Group of working materials:

| P | M | K | N | S | H |
|---|---|---|---|---|---|
|   | - |   | - | - |   |

● Raccomandato - Most suitable  
○ Possibile - Possible



#### Tolleranze | Tolerances:

| Ø di taglio   Cutting Ø           | Raggio   Radius                         |
|-----------------------------------|-----------------------------------------|
| d ≤ 6: 0/-0.01<br>d > 6: 0/-0.015 | R ≤ 0.25: 0/-0.005<br>R > 0.25: 0/-0.01 |

| 430RHP                              |                                 |                                    |                                      |                                    |                                    |                                 |                                             |                            |                             |                                           |                                                                                                                                                                |       |       |       | 430RHP |           |                               |                                                                                       |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|---------------------------------------------|----------------------------|-----------------------------|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|--------|-----------|-------------------------------|---------------------------------------------------------------------------------------|-------------------------------|
| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Diametro sotto collo<br>Under Neck diameter | Angolo collo<br>Neck angle | Raggio collo<br>Radius neck | Angolo interferenza<br>Interference angle | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br><br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |       |       |        | ART. NUM. | Codice d'ordine<br>Order code |  | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | d <sub>4</sub>                              | θ <sub>n</sub>             | R <sub>1</sub>              | θ <sub>k</sub>                            | 0,5°                                                                                                                                                           | 1°    | 1°5   | 2°    | 3°     |           |                               | €                                                                                     |                               |
| 0.5                                 | 0.25                            | 50                                 | 0.35                                 | 4                                  | 4                                  | 0.47                            | 0.521                                       | 0.4                        | 7                           | 8.35                                      | 4.62                                                                                                                                                           | 5.00  | 5.30  | 5.55  | 5.99   | 441289    | 430RHP .5X.25X.4X4X50X4       |                                                                                       |                               |
| 0.5                                 | 0.25                            | 50                                 | 0.35                                 | 6                                  | 4                                  | 0.47                            | 0.549                                       | 0.4                        | 10                          | 7.20                                      | 6.80                                                                                                                                                           | 7.41  | 7.86  | 8.24  | 8.89   | 441290    | 430RHP .5X.25X.4X6X50X4       |                                                                                       |                               |
| 0.5                                 | 0.25                            | 50                                 | 0.35                                 | 12                                 | 4                                  | 0.47                            | 0.836                                       | 0.9                        | 10                          | 5.21                                      | 2.62                                                                                                                                                           | 13.05 | 13.94 | 14.55 | 15.49  | 441293    | 430RHP .5X.25X.9X12X50X4      |                                                                                       |                               |
| 0.5                                 | 0.25                            | 50                                 | 0.35                                 | 6                                  | 4                                  | 0.47                            | 0.648                                       | 0.9                        | 10                          | 7.32                                      | 2.62                                                                                                                                                           | 6.92  | 7.52  | 7.97  | 8.69   | 441291    | 430RHP .5X.25X.9X6X50X4       |                                                                                       |                               |
| 0.5                                 | 0.25                            | 50                                 | 0.35                                 | 8                                  | 4                                  | 0.47                            | 0.710                                       | 0.9                        | 10                          | 6.45                                      | 2.62                                                                                                                                                           | 8.96  | 9.67  | 10.18 | 10.99  | 441292    | 430RHP .5X.25X.9X8X50X4       |                                                                                       |                               |
| 0.6                                 | 0.3                             | 50                                 | 0.40                                 | 10                                 | 4                                  | 0.57                            | 0.704                                       | 0.4                        | 10                          | 5.57                                      | 10.89                                                                                                                                                          | 11.70 | 12.27 | 12.73 | 13.52  | 441298    | 430RHP .6X.3X.4X10X50X4       |                                                                                       |                               |
| 0.6                                 | 0.3                             | 55                                 | 0.40                                 | 12                                 | 4                                  | 0.57                            | 0.732                                       | 0.4                        | 10                          | 5.02                                      | 12.94                                                                                                                                                          | 13.83 | 14.44 | 14.95 | 15.79  | 441299    | 430RHP .6X.3X.4X12X55X4       |                                                                                       |                               |
| 0.6                                 | 0.3                             | 55                                 | 0.40                                 | 15                                 | 4                                  | 0.57                            | 0.774                                       | 0.4                        | 10                          | 4.37                                      | 15.99                                                                                                                                                          | 17.01 | 17.68 | 18.24 | 19.27  | 441300    | 430RHP .6X.3X.4X15X55X4       |                                                                                       |                               |
| 0.6                                 | 0.3                             | 50                                 | 0.40                                 | 2                                  | 4                                  | 0.57                            | 0.592                                       | 0.4                        | 4                           | 9.93                                      | 2.42                                                                                                                                                           | 2.59  | 2.73  | 2.85  | 3.08   | 441294    | 430RHP .6X.3X.4X2X50X4        |                                                                                       |                               |
| 0.6                                 | 0.3                             | 50                                 | 0.40                                 | 4                                  | 4                                  | 0.57                            | 0.620                                       | 0.4                        | 7                           | 8.31                                      | 4.62                                                                                                                                                           | 5.00  | 5.29  | 5.54  | 5.98   | 441295    | 430RHP .6X.3X.4X4X50X4        |                                                                                       |                               |
| 0.6                                 | 0.3                             | 50                                 | 0.40                                 | 6                                  | 4                                  | 0.57                            | 0.648                                       | 0.4                        | 10                          | 7.14                                      | 6.80                                                                                                                                                           | 7.41  | 7.85  | 8.23  | 8.88   | 441296    | 430RHP .6X.3X.4X6X50X4        |                                                                                       |                               |
| 0.6                                 | 0.3                             | 50                                 | 0.40                                 | 8                                  | 4                                  | 0.57                            | 0.676                                       | 0.4                        | 10                          | 6.26                                      | 8.85                                                                                                                                                           | 9.56  | 10.07 | 10.50 | 11.22  | 441297    | 430RHP .6X.3X.4X8X50X4        |                                                                                       |                               |
| 0.6                                 | 0.3                             | 50                                 | 0.40                                 | 10                                 | 4                                  | 0.57                            | 0.872                                       | 0.9                        | 10                          | 5.70                                      | 2.67                                                                                                                                                           | 11.01 | 11.81 | 12.37 | 13.25  | 441304    | 430RHP .6X.3X.9X10X50X4       |                                                                                       |                               |
| 0.6                                 | 0.3                             | 55                                 | 0.40                                 | 12                                 | 4                                  | 0.57                            | 0.934                                       | 0.9                        | 10                          | 5.14                                      | 2.67                                                                                                                                                           | 13.05 | 13.94 | 14.54 | 15.49  | 441305    | 430RHP .6X.3X.9X12X55X4       |                                                                                       |                               |
| 0.6                                 | 0.3                             | 55                                 | 0.40                                 | 15                                 | 4                                  | 0.57                            | 1.029                                       | 0.9                        | 10                          | 4.49                                      | 2.67                                                                                                                                                           | 16.10 | 17.11 | 17.78 | 18.81  | 441306    | 430RHP .6X.3X.9X15X55X4       |                                                                                       |                               |
| 0.6                                 | 0.3                             | 50                                 | 0.40                                 | 4                                  | 4                                  | 0.57                            | 0.683                                       | 0.9                        | 7                           | 8.41                                      | 2.67                                                                                                                                                           | 4.70  | 5.07  | 5.37  | 5.85   | 441301    | 430RHP .6X.3X.9X4X50X4        |                                                                                       |                               |
| 0.6                                 | 0.3                             | 50                                 | 0.40                                 | 6                                  | 4                                  | 0.57                            | 0.746                                       | 0.9                        | 10                          | 7.26                                      | 2.67                                                                                                                                                           | 6.92  | 7.51  | 7.96  | 8.68   | 441302    | 430RHP .6X.3X.9X6X50X4        |                                                                                       |                               |
| 0.6                                 | 0.3                             | 50                                 | 0.40                                 | 8                                  | 4                                  | 0.57                            | 0.809                                       | 0.9                        | 10                          | 6.38                                      | 2.67                                                                                                                                                           | 8.96  | 9.67  | 10.18 | 10.98  | 441303    | 430RHP .6X.3X.9X8X50X4        |                                                                                       |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

**Frese sferiche con scarico in metallo duro integrale micrograna.**  
**Ball nose tapered neck end mills in solid carbide micro grain.**

| 430RHP                              |     |                                 |                |                                    |                |                                      |                |                                    |                |                                    |       |                                 |       |                                             |       |                            |        |                             |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
|-------------------------------------|-----|---------------------------------|----------------|------------------------------------|----------------|--------------------------------------|----------------|------------------------------------|----------------|------------------------------------|-------|---------------------------------|-------|---------------------------------------------|-------|----------------------------|--------|-----------------------------|--|-------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|-----------|-------------------------------|-------------------------------------------------------------------------------------|-------------------------------|
| Diametro fresa<br>End mill diameter |     | Raggio fresa<br>End mill radius |                | Lunghezza totale<br>Overall length |                | Lunghezza di taglio<br>Length of cut |                | Lunghezza utile<br>Length of reach |                | Diametro attacco<br>Shank diameter |       | Diametro collo<br>Neck diameter |       | Diametro sotto collo<br>Under Neck diameter |       | Angolo collo<br>Neck angle |        | Raggio collo<br>Radius neck |  | Angolo interferenza<br>Interference angle |  | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |  |  |  |  | ART. NUM. | Codice d'ordine<br>Order code |  | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R   | l <sub>1</sub>                  | l <sub>2</sub> | l <sub>3</sub>                     | d <sub>2</sub> | d <sub>3</sub>                       | d <sub>4</sub> | θ <sub>0n</sub>                    | R <sub>1</sub> | θ <sub>0k</sub>                    | 0,5°  | 1°                              | 1°5   | 2°                                          | 3°    |                            |        |                             |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               | €                                                                                   |                               |
| 0.6                                 | 0.3 | 50                              | 0.40           | 10                                 | 4              | 0.57                                 | 1.039          | 1.4                                | 10             | 5.83                               | 1.41  | 2.80                            | 11.13 | 11.92                                       | 12.94 | 441311                     | 430RHP | .6X.3X1.4X10X50X4           |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 0.6                                 | 0.3 | 60                              | 0.40           | 20                                 | 4              | 0.57                                 | 1.528          | 1.4                                | 10             | 3.82                               | 1.41  | 2.80                            | 21.31 | 22.47                                       | 23.84 | 441312                     | 430RHP | .6X.3X1.4X20X60X4           |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 0.6                                 | 0.3 | 50                              | 0.40           | 4                                  | 4              | 0.57                                 | 0.746          | 1.4                                | 7              | 8.52                               | 1.41  | 2.80                            | 4.78  | 5.16                                        | 5.70  | 441307                     | 430RHP | .6X.3X1.4X4X50X4            |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 0.6                                 | 0.3 | 50                              | 0.40           | 5                                  | 4              | 0.57                                 | 0.795          | 1.4                                | 7              | 7.91                               | 1.41  | 2.80                            | 5.80  | 6.23                                        | 6.83  | 441308                     | 430RHP | .6X.3X1.4X5X50X4            |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 0.6                                 | 0.3 | 50                              | 0.40           | 6                                  | 4              | 0.57                                 | 0.844          | 1.4                                | 10             | 7.39                               | 1.41  | 2.80                            | 7.04  | 7.63                                        | 8.45  | 441309                     | 430RHP | .6X.3X1.4X6X50X4            |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 0.6                                 | 0.3 | 50                              | 0.40           | 8                                  | 4              | 0.57                                 | 0.941          | 1.4                                | 10             | 6.52                               | 1.41  | 2.80                            | 9.08  | 9.78                                        | 10.71 | 441310                     | 430RHP | .6X.3X1.4X8X50X4            |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 0.6                                 | 0.3 | 55                              | 0.40           | 12                                 | 4              | 0.57                                 | 1.745          | 2.9                                | 10             | 5.71                               | 0.77  | 0.90                            | 1.12  | 1.58                                        | 13.56 | 441315                     | 430RHP | .6X.3X2.9X12X55X4           |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 0.6                                 | 0.3 | 50                              | 0.40           | 6                                  | 4              | 0.57                                 | 1.137          | 2.9                                | 10             | 7.79                               | 0.77  | 0.90                            | 1.12  | 1.58                                        | 7.45  | 441313                     | 430RHP | .6X.3X2.9X6X50X4            |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 0.6                                 | 0.3 | 50                              | 0.40           | 8                                  | 4              | 0.57                                 | 1.340          | 2.9                                | 10             | 6.95                               | 0.77  | 0.90                            | 1.12  | 1.58                                        | 9.49  | 441314                     | 430RHP | .6X.3X2.9X8X50X4            |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 0.8                                 | 0.4 | 55                              | 0.50           | 12                                 | 4              | 0.77                                 | 0.931          | 0.4                                | 10             | 4.86                               | 12.93 | 13.83                           | 14.44 | 14.94                                       | 15.77 | 441319                     | 430RHP | .8X.4X.4X12X55X4            |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 0.8                                 | 0.4 | 50                              | 0.50           | 4                                  | 4              | 0.77                                 | 0.819          | 0.4                                | 7              | 8.22                               | 4.61  | 4.99                            | 5.28  | 5.53                                        | 5.97  | 441316                     | 430RHP | .8X.4X.4X4X50X4             |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 0.8                                 | 0.4 | 50                              | 0.50           | 6                                  | 4              | 0.77                                 | 0.847          | 0.4                                | 7              | 7.01                               | 6.66  | 7.14                            | 7.50  | 7.79                                        | 8.30  | 441317                     | 430RHP | .8X.4X.4X6X50X4             |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 0.8                                 | 0.4 | 50                              | 0.50           | 8                                  | 4              | 0.77                                 | 0.875          | 0.4                                | 10             | 6.11                               | 8.85  | 9.56                            | 10.06 | 10.49                                       | 11.21 | 441318                     | 430RHP | .8X.4X.4X8X50X4             |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 0.8                                 | 0.4 | 55                              | 0.50           | 12                                 | 4              | 0.77                                 | 1.131          | 0.9                                | 10             | 4.99                               | 2.77  | 13.04                           | 13.93 | 14.54                                       | 15.48 | 441321                     | 430RHP | .8X.4X.9X12X55X4            |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 0.8                                 | 0.4 | 55                              | 0.50           | 16                                 | 4              | 0.77                                 | 1.257          | 0.9                                | 10             | 4.15                               | 2.77  | 17.12                           | 18.16 | 18.85                                       | 19.90 | 441322                     | 430RHP | .8X.4X.9X16X55X4            |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 0.8                                 | 0.4 | 50                              | 0.50           | 8                                  | 4              | 0.77                                 | 1.006          | 0.9                                | 10             | 6.24                               | 2.77  | 8.96                            | 9.66  | 10.17                                       | 10.97 | 441320                     | 430RHP | .8X.4X.9X8X50X4             |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 1                                   | 0.5 | 55                              | 0.80           | 10                                 | 6              | 0.94                                 | 1.068          | 0.4                                | 10             | 6.76                               | 11.07 | 11.79                           | 12.33 | 12.78                                       | 13.54 | 441325                     | 430RHP | 1X.5X.4X10X55X6             |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 1                                   | 0.5 | 60                              | 0.80           | 15                                 | 6              | 0.94                                 | 1.138          | 0.4                                | 10             | 5.51                               | 16.16 | 17.08                           | 17.73 | 18.27                                       | 19.31 | 441326                     | 430RHP | 1X.5X.4X15X60X6             |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 1                                   | 0.5 | 65                              | 0.80           | 20                                 | 6              | 0.94                                 | 1.208          | 0.4                                | 10             | 4.65                               | 21.23 | 22.33                           | 23.08 | 23.69                                       | 25.73 | 441327                     | 430RHP | 1X.5X.4X20X65X6             |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 1                                   | 0.5 | 70                              | 0.80           | 25                                 | 6              | 0.94                                 | 1.278          | 0.4                                | 10             | 4.02                               | 26.31 | 27.56                           | 28.38 | 29.05                                       | 32.15 | 441328                     | 430RHP | 1X.5X.4X25X70X6             |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 1                                   | 0.5 | 75                              | 0.80           | 30                                 | 6              | 0.94                                 | 1.348          | 0.4                                | 10             | 3.54                               | 31.37 | 32.76                           | 33.66 | 34.82                                       | 38.57 | 441329                     | 430RHP | 1X.5X.4X30X75X6             |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 1                                   | 0.5 | 95                              | 0.80           | 50                                 | 6              | 0.94                                 | 1.627          | 0.4                                | 10             | 2.40                               | 51.62 | 53.44                           | 55.27 | 57.96                                       | 38.57 | 441330                     | 430RHP | 1X.5X.4X50X95X6             |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 1                                   | 0.5 | 50                              | 0.80           | 6                                  | 6              | 0.94                                 | 1.013          | 0.4                                | 7              | 8.26                               | 6.82  | 7.24                            | 7.57  | 7.85                                        | 8.34  | 441323                     | 430RHP | 1X.5X.4X6X50X6              |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 1                                   | 0.5 | 115                             | 0.80           | 70                                 | 6              | 0.94                                 | 1.906          | 0.4                                | 10             | 1.81                               | 71.83 | 73.98                           | 77.33 | 57.96                                       | 38.57 | 441331                     | 430RHP | 1X.5X.4X70X115X6            |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 1                                   | 0.5 | 55                              | 0.80           | 8                                  | 6              | 0.94                                 | 1.041          | 0.4                                | 7              | 7.44                               | 8.85  | 9.36                            | 9.74  | 10.07                                       | 10.62 | 441324                     | 430RHP | 1X.5X.4X8X55X6              |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 1                                   | 0.5 | 55                              | 0.80           | 10                                 | 6              | 0.94                                 | 1.229          | 0.9                                | 10             | 6.88                               | 5.47  | 11.20                           | 11.91 | 12.44                                       | 13.28 | 441333                     | 430RHP | 1X.5X.9X10X55X6             |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 1                                   | 0.5 | 60                              | 0.80           | 15                                 | 6              | 0.94                                 | 1.386          | 0.9                                | 10             | 5.64                               | 5.47  | 16.28                           | 17.19 | 17.84                                       | 18.84 | 441334                     | 430RHP | 1X.5X.9X15X60X6             |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 1                                   | 0.5 | 60                              | 0.80           | 16                                 | 6              | 0.94                                 | 1.418          | 0.9                                | 10             | 5.44                               | 5.47  | 17.29                           | 18.24 | 18.91                                       | 19.94 | 441335                     | 430RHP | 1X.5X.9X16X60X6             |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 1                                   | 0.5 | 65                              | 0.80           | 20                                 | 6              | 0.94                                 | 1.543          | 0.9                                | 10             | 4.77                               | 5.47  | 21.35                           | 22.44 | 23.18                                       | 24.68 | 441336                     | 430RHP | 1X.5X.9X20X65X6             |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 1                                   | 0.5 | 70                              | 0.80           | 25                                 | 6              | 0.94                                 | 1.700          | 0.9                                | 10             | 4.14                               | 5.47  | 26.42                           | 27.66 | 28.48                                       | 30.83 | 441337                     | 430RHP | 1X.5X.9X25X70X6             |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 1                                   | 0.5 | 75                              | 0.80           | 30                                 | 6              | 0.94                                 | 1.857          | 0.9                                | 10             | 3.65                               | 5.47  | 31.49                           | 32.86 | 33.75                                       | 36.98 | 441338                     | 430RHP | 1X.5X.9X30X75X6             |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 1                                   | 0.5 | 80                              | 0.80           | 35                                 | 6              | 0.94                                 | 2.015          | 0.9                                | 10             | 3.27                               | 5.47  | 36.55                           | 38.04 | 39.00                                       | 43.12 | 441339                     | 430RHP | 1X.5X.9X35X80X6             |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 1                                   | 0.5 | 85                              | 0.80           | 40                                 | 6              | 0.94                                 | 2.172          | 0.9                                | 10             | 2.96                               | 5.47  | 41.61                           | 43.22 | 44.46                                       | 43.12 | 441340                     | 430RHP | 1X.5X.9X40X85X6             |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 1                                   | 0.5 | 95                              | 0.80           | 50                                 | 6              | 0.94                                 | 2.486          | 0.9                                | 10             | 2.48                               | 5.47  | 51.73                           | 53.53 | 55.55                                       | 43.12 | 441341                     | 430RHP | 1X.5X.9X50X95X6             |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 1                                   | 0.5 | 50                              | 0.80           | 6                                  | 6              | 0.94                                 | 1.103          | 0.9                                | 7              | 8.36                               | 5.47  | 9.61                            | 7.32  | 7.65                                        | 8.19  | 441332                     | 430RHP | 1X.5X.9X6X50X6              |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 1                                   | 0.5 | 105                             | 0.80           | 60                                 | 6              | 0.94                                 | 2.800          | 0.9                                | 10             | 2.14                               | 5.47  | 61.84                           | 63.81 | 66.63                                       | 43.12 | 441342                     | 430RHP | 1X.5X.9X60X105X6            |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 1                                   | 0.5 | 115                             | 0.80           | 70                                 | 6              | 0.94                                 | 3.114          | 0.9                                | 10             | 1.88                               | 5.47  | 71.94                           | 74.09 | 66.63                                       | 43.12 | 441343                     | 430RHP | 1X.5X.9X70X115X6            |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 1                                   | 0.5 | 60                              | 0.80           | 12                                 | 6              | 0.94                                 | 1.487          | 1.4                                | 10             | 6.45                               | 2.87  | 5.85                            | 13.36 | 14.14                                       | 15.20 | 441345                     | 430RHP | 1X.5X1.4X12X60X6            |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |
| 1                                   | 0.5 | 60                              | 0.80           | 16                                 | 6              | 0.94                                 | 1.683          | 1.4                                | 10             | 5.57                               | 2.87  | 5.85                            | 17.42 | 18.36                                       | 19.56 | 441346                     | 430RHP | 1X.5X1.4X16X60X6            |  |                                           |  |                                                                                                                                                            |  |  |  |  |           |                               |                                                                                     |                               |

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|                                     |                                 |                                    |                                      |                                    |                                    |                                 |                                             |                            |                             |                                           |                                                                                                                                                            |       |       |       | 430RHP |           |                               |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|---------------------------------------------|----------------------------|-----------------------------|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|--------|-----------|-------------------------------|-------------------------------|
| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Diametro sotto collo<br>Under Neck diameter | Angolo collo<br>Neck angle | Raggio collo<br>Radius neck | Angolo interferenza<br>Interference angle | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |       |       |        | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | d <sub>4</sub>                              | θ <sub>0n</sub>            | R <sub>1</sub>              | θ <sub>0k</sub>                           | 0,5°                                                                                                                                                       | 1°    | 1°5   | 2°    | 3°     |           |                               | €                             |
| 1                                   | 0.5                             | 65                                 | 0.80                                 | 20                                 | 6                                  | 0.94                            | 1.878                                       | 1.4                        | 10                          | 4.90                                      | 2.87                                                                                                                                                       | 5.85  | 21.48 | 22.55 | 23.88  | 441347    | 430RHP 1X.5X1.4X20X65X6       |                               |
| 1                                   | 0.5                             | 70                                 | 0.80                                 | 22                                 | 6                                  | 0.94                            | 1.976                                       | 1.4                        | 10                          | 4.62                                      | 2.87                                                                                                                                                       | 5.85  | 23.50 | 24.64 | 26.03  | 441348    | 430RHP 1X.5X1.4X22X70X6       |                               |
| 1                                   | 0.5                             | 70                                 | 0.80                                 | 25                                 | 6                                  | 0.94                            | 2.123                                       | 1.4                        | 10                          | 4.26                                      | 2.87                                                                                                                                                       | 5.85  | 26.55 | 27.76 | 29.51  | 441349    | 430RHP 1X.5X1.4X25X70X6       |                               |
| 1                                   | 0.5                             | 95                                 | 0.80                                 | 50                                 | 6                                  | 0.94                            | 3.345                                       | 1.4                        | 10                          | 2.57                                      | 2.87                                                                                                                                                       | 5.85  | 51.84 | 53.63 | 29.51  | 441350    | 430RHP 1X.5X1.4X50X95X6       |                               |
| 1                                   | 0.5                             | 50                                 | 0.80                                 | 6                                  | 6                                  | 0.94                            | 1.194                                       | 1.4                        | 7                           | 8.47                                      | 2.87                                                                                                                                                       | 5.85  | 7.01  | 7.41  | 8.01   | 441344    | 430RHP 1X.5X1.4X6X50X6        |                               |
| 1                                   | 0.5                             | 55                                 | 0.80                                 | 10                                 | 6                                  | 0.94                            | 1.872                                       | 2.9                        | 10                          | 7.42                                      | 1.57                                                                                                                                                       | 1.86  | 2.35  | 3.39  | 11.74  | 441351    | 430RHP 1X.5X2.9X10X55X6       |                               |
| 1                                   | 0.5                             | 60                                 | 0.80                                 | 15                                 | 6                                  | 0.94                            | 2.379                                       | 2.9                        | 10                          | 6.20                                      | 1.57                                                                                                                                                       | 1.86  | 2.35  | 3.39  | 16.81  | 441352    | 430RHP 1X.5X2.9X15X60X6       |                               |
| 1                                   | 0.5                             | 65                                 | 0.80                                 | 20                                 | 6                                  | 0.94                            | 2.885                                       | 2.9                        | 10                          | 5.33                                      | 1.57                                                                                                                                                       | 1.86  | 2.35  | 3.39  | 21.88  | 441353    | 430RHP 1X.5X2.9X20X65X6       |                               |
| 1                                   | 0.5                             | 75                                 | 0.80                                 | 30                                 | 6                                  | 0.94                            | 3.898                                       | 2.9                        | 10                          | 4.16                                      | 1.57                                                                                                                                                       | 1.86  | 2.35  | 3.39  | 32.00  | 441354    | 430RHP 1X.5X2.9X30X75X6       |                               |
| 1.5                                 | 0.75                            | 55                                 | 1.35                                 | 10                                 | 6                                  | 1.42                            | 1.541                                       | 0.4                        | 7                           | 6.51                                      | 10.97                                                                                                                                                      | 11.52 | 11.93 | 12.28 | 12.90  | 441356    | 430RHP 1.5X.75X.4X10X55X6     |                               |
| 1.5                                 | 0.75                            | 55                                 | 1.35                                 | 12                                 | 6                                  | 1.42                            | 1.569                                       | 0.4                        | 7                           | 5.93                                      | 13.00                                                                                                                                                      | 13.62 | 14.07 | 14.45 | 15.47  | 441357    | 430RHP 1.5X.75X.4X12X55X6     |                               |
| 1.5                                 | 0.75                            | 75                                 | 1.35                                 | 30                                 | 6                                  | 1.42                            | 1.820                                       | 0.4                        | 10                          | 3.30                                      | 31.46                                                                                                                                                      | 32.79 | 33.68 | 34.85 | 38.57  | 441358    | 430RHP 1.5X.75X.4X30X75X6     |                               |
| 1.5                                 | 0.75                            | 55                                 | 1.35                                 | 8                                  | 6                                  | 1.42                            | 1.513                                       | 0.4                        | 7                           | 7.21                                      | 8.95                                                                                                                                                       | 9.41  | 9.78  | 10.09 | 10.62  | 441355    | 430RHP 1.5X.75X.4X8X55X6      |                               |
| 1.5                                 | 0.75                            | 55                                 | 1.35                                 | 10                                 | 6                                  | 1.42                            | 1.692                                       | 0.9                        | 7                           | 6.63                                      | 7.83                                                                                                                                                       | 11.08 | 11.61 | 12.02 | 12.67  | 441359    | 430RHP 1.5X.75X.9X10X55X6     |                               |
| 1.5                                 | 0.75                            | 60                                 | 1.35                                 | 15                                 | 6                                  | 1.42                            | 1.849                                       | 0.9                        | 10                          | 5.36                                      | 7.83                                                                                                                                                       | 16.40 | 17.25 | 17.88 | 18.86  | 441360    | 430RHP 1.5X.75X.9X15X60X6     |                               |
| 1.5                                 | 0.75                            | 65                                 | 1.35                                 | 20                                 | 6                                  | 1.42                            | 2.006                                       | 0.9                        | 10                          | 4.50                                      | 7.83                                                                                                                                                       | 21.47 | 22.49 | 23.21 | 24.72  | 441361    | 430RHP 1.5X.75X.9X20X65X6     |                               |
| 1.5                                 | 0.75                            | 75                                 | 1.35                                 | 30                                 | 6                                  | 1.42                            | 2.320                                       | 0.9                        | 10                          | 3.40                                      | 7.83                                                                                                                                                       | 31.59 | 32.90 | 33.78 | 37.01  | 441362    | 430RHP 1.5X.75X.9X30X75X6     |                               |
| 1.5                                 | 0.75                            | 55                                 | 1.35                                 | 10                                 | 6                                  | 1.42                            | 1.843                                       | 1.4                        | 7                           | 6.75                                      | 4.23                                                                                                                                                       | 8.59  | 11.19 | 11.70 | 12.45  | 441363    | 430RHP 1.5X.75X1.4X10X55X6    |                               |
| 1.5                                 | 0.75                            | 65                                 | 1.35                                 | 20                                 | 6                                  | 1.42                            | 2.332                                       | 1.4                        | 10                          | 4.62                                      | 4.23                                                                                                                                                       | 8.59  | 21.61 | 22.61 | 23.91  | 441364    | 430RHP 1.5X.75X1.4X20X65X6    |                               |
| 1.5                                 | 0.75                            | 75                                 | 1.35                                 | 30                                 | 6                                  | 1.42                            | 2.820                                       | 1.4                        | 10                          | 3.51                                      | 4.23                                                                                                                                                       | 8.59  | 31.73 | 33.02 | 35.45  | 441365    | 430RHP 1.5X.75X1.4X30X75X6    |                               |
| 1.5                                 | 0.75                            | 85                                 | 1.35                                 | 40                                 | 6                                  | 1.42                            | 3.309                                       | 1.4                        | 10                          | 2.83                                      | 4.23                                                                                                                                                       | 8.59  | 41.84 | 43.36 | 35.45  | 441366    | 430RHP 1.5X.75X1.4X40X85X6    |                               |
| 1.5                                 | 0.75                            | 95                                 | 1.35                                 | 50                                 | 6                                  | 1.42                            | 3.798                                       | 1.4                        | 10                          | 2.37                                      | 4.23                                                                                                                                                       | 8.59  | 51.95 | 53.67 | 35.45  | 441367    | 430RHP 1.5X.75X1.4X50X95X6    |                               |
| 1.5                                 | 0.75                            | 65                                 | 1.35                                 | 20                                 | 6                                  | 1.42                            | 3.310                                       | 2.9                        | 10                          | 5.03                                      | 2.42                                                                                                                                                       | 2.87  | 3.63  | 5.25  | 22.05  | 441368    | 430RHP 1.5X.75X2.9X20X65X6    |                               |
| 2                                   | 1                               | 55                                 | 1.70                                 | 12                                 | 6                                  | 1.92                            | 2.064                                       | 0.4                        | 7                           | 5.64                                      | 13.00                                                                                                                                                      | 13.61 | 14.06 | 14.43 | 15.40  | 441370    | 430RHP 2X1X.4X12X55X6         |                               |
| 2                                   | 1                               | 60                                 | 1.70                                 | 16                                 | 6                                  | 1.92                            | 2.120                                       | 0.4                        | 7                           | 4.74                                      | 17.05                                                                                                                                                      | 17.79 | 18.31 | 18.74 | 20.54  | 441371    | 430RHP 2X1X.4X16X60X6         |                               |
| 2                                   | 1                               | 65                                 | 1.70                                 | 20                                 | 6                                  | 1.92                            | 2.176                                       | 0.4                        | 10                          | 4.09                                      | 21.33                                                                                                                                                      | 22.37 | 23.09 | 23.68 | 25.67  | 441372    | 430RHP 2X1X.4X20X65X6         |                               |
| 2                                   | 1                               | 65                                 | 1.70                                 | 25                                 | 6                                  | 1.92                            | 2.245                                       | 0.4                        | 10                          | 3.49                                      | 26.40                                                                                                                                                      | 27.59 | 28.39 | 29.05 | 32.09  | 441373    | 430RHP 2X1X.4X25X65X6         |                               |
| 2                                   | 1                               | 70                                 | 1.70                                 | 30                                 | 6                                  | 1.92                            | 2.315                                       | 0.4                        | 10                          | 3.04                                      | 31.46                                                                                                                                                      | 32.79 | 33.67 | 34.81 | 38.51  | 441374    | 430RHP 2X1X.4X30X70X6         |                               |
| 2                                   | 1                               | 80                                 | 1.70                                 | 40                                 | 6                                  | 1.92                            | 2.455                                       | 0.4                        | 10                          | 2.42                                      | 41.58                                                                                                                                                      | 43.14 | 44.26 | 46.39 | 38.51  | 441375    | 430RHP 2X1X.4X40X80X6         |                               |
| 2                                   | 1                               | 50                                 | 1.70                                 | 8                                  | 6                                  | 1.92                            | 2.008                                       | 0.4                        | 4                           | 6.96                                      | 8.70                                                                                                                                                       | 9.03  | 9.28  | 9.50  | 10.27  | 441369    | 430RHP 2X1X.4X8X50X6          |                               |
| 2                                   | 1                               | 120                                | 1.70                                 | 80                                 | 6                                  | 1.92                            | 3.013                                       | 0.4                        | 10                          | 1.34                                      | 81.99                                                                                                                                                      | 84.47 | 44.26 | 46.39 | 38.51  | 441376    | 430RHP 2X1X.4X80X120X6        |                               |
| 2                                   | 1                               | 55                                 | 1.70                                 | 12                                 | 6                                  | 1.92                            | 2.244                                       | 0.9                        | 7                           | 5.76                                      | 8.30                                                                                                                                                       | 13.11 | 13.70 | 14.14 | 14.84  | 441377    | 430RHP 2X1X.9X12X55X6         |                               |
| 2                                   | 1                               | 60                                 | 1.70                                 | 16                                 | 6                                  | 1.92                            | 2.369                                       | 0.9                        | 7                           | 4.86                                      | 8.30                                                                                                                                                       | 17.16 | 17.88 | 18.39 | 19.76  | 441378    | 430RHP 2X1X.9X16X60X6         |                               |
| 2                                   | 1                               | 65                                 | 1.70                                 | 20                                 | 6                                  | 1.92                            | 2.495                                       | 0.9                        | 10                          | 4.20                                      | 8.30                                                                                                                                                       | 21.48 | 22.49 | 23.20 | 24.68  | 441379    | 430RHP 2X1X.9X20X65X6         |                               |
| 2                                   | 1                               | 65                                 | 1.70                                 | 25                                 | 6                                  | 1.92                            | 2.652                                       | 0.9                        | 10                          | 3.60                                      | 8.30                                                                                                                                                       | 26.54 | 27.70 | 28.50 | 30.82  | 441380    | 430RHP 2X1X.9X25X65X6         |                               |
| 2                                   | 1                               | 70                                 | 1.70                                 | 30                                 | 6                                  | 1.92                            | 2.809                                       | 0.9                        | 10                          | 3.14                                      | 8.30                                                                                                                                                       | 31.60 | 32.90 | 33.77 | 36.97  | 441381    | 430RHP 2X1X.9X30X70X6         |                               |
| 2                                   | 1                               | 75                                 | 1.70                                 | 35                                 | 6                                  | 1.92                            | 2.966                                       | 0.9                        | 10                          | 2.79                                      | 8.30                                                                                                                                                       | 36.66 | 38.08 | 39.02 | 36.97  | 441382    | 430RHP 2X1X.9X35X75X6         |                               |
| 2                                   | 1                               | 80                                 | 1.70                                 | 40                                 | 6                                  | 1.92                            | 3.123                                       | 0.9                        | 10                          | 2.51                                      | 8.30                                                                                                                                                       | 41.72 | 43.25 | 44.50 | 36.97  | 441383    | 430RHP 2X1X.9X40X80X6         |                               |
| 2                                   | 1                               | 90                                 | 1.70                                 | 50                                 | 6                                  | 1.92                            | 3.438                                       | 0.9                        | 10                          | 2.09                                      | 8.30                                                                                                                                                       | 51.82 | 53.56 | 55.58 | 36.97  | 441384    | 430RHP 2X1X.9X50X90X6         |                               |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

Frese sferiche con scarico in metallo duro integrale micrograna.  
Ball nose tapered neck end mills in solid carbide micro grain.

| 430RHP                              |                                 |                                    |                                      |                                    |                                    |                                 |                                             |                            |                             |                                           |                                                                                                                                                            |       |       |       |       | <div>ART. NUM.</div> <div>Codice d'ordine<br/>Order code</div> <div></div> <div>Prezzo utensile<br/>Tool Price</div> |        |                   |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|---------------------------------------------|----------------------------|-----------------------------|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-------------------|
| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Diametro sotto collo<br>Under Neck diameter | Angolo collo<br>Neck angle | Raggio collo<br>Radius neck | Angolo interferenza<br>Interference angle | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |       |       |       |                                                                                                                                                                                                         |        |                   |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | d <sub>4</sub>                              | θ° <sub>n</sub>            | R <sub>1</sub>              | θ° <sub>k</sub>                           | 0,5°                                                                                                                                                       | 1°    | 1°5   | 2°    | 3°    |                                                                                                                                                                                                         |        | €                 |
| 2                                   | 1                               | 100                                | 1.70                                 | 60                                 | 6                                  | 1.92                            | 3.752                                       | 0.9                        | 10                          | 1.79                                      | 8.30                                                                                                                                                       | 61.92 | 63.84 | 55.58 | 36.97 | 441385                                                                                                                                                                                                  | 430RHP | 2X1X.9X60X100X6   |
| 2                                   | 1                               | 110                                | 1.70                                 | 70                                 | 6                                  | 1.92                            | 4.066                                       | 0.9                        | 10                          | 1.56                                      | 8.30                                                                                                                                                       | 72.02 | 74.15 | 55.58 | 36.97 | 441386                                                                                                                                                                                                  | 430RHP | 2X1X.9X70X110X6   |
| 2                                   | 1                               | 55                                 | 1.70                                 | 10                                 | 6                                  | 1.92                            | 2.326                                       | 1.4                        | 7                           | 6.47                                      | 4.63                                                                                                                                                       | 9.19  | 11.20 | 11.70 | 12.43 | 441387                                                                                                                                                                                                  | 430RHP | 2X1X1.4X10X55X6   |
| 2                                   | 1                               | 60                                 | 1.70                                 | 16                                 | 6                                  | 1.92                            | 2.619                                       | 1.4                        | 7                           | 4.98                                      | 4.63                                                                                                                                                       | 9.19  | 17.27 | 17.97 | 18.98 | 441388                                                                                                                                                                                                  | 430RHP | 2X1X1.4X16X60X6   |
| 2                                   | 1                               | 65                                 | 1.70                                 | 20                                 | 6                                  | 1.92                            | 2.814                                       | 1.4                        | 10                          | 4.32                                      | 4.63                                                                                                                                                       | 9.19  | 21.62 | 22.61 | 23.90 | 441389                                                                                                                                                                                                  | 430RHP | 2X1X1.4X20X65X6   |
| 2                                   | 1                               | 65                                 | 1.70                                 | 22                                 | 6                                  | 1.92                            | 2.912                                       | 1.4                        | 10                          | 4.05                                      | 4.63                                                                                                                                                       | 9.19  | 23.65 | 24.70 | 26.05 | 441390                                                                                                                                                                                                  | 430RHP | 2X1X1.4X22X65X6   |
| 2                                   | 1                               | 65                                 | 1.70                                 | 25                                 | 6                                  | 1.92                            | 3.059                                       | 1.4                        | 10                          | 3.71                                      | 4.63                                                                                                                                                       | 9.19  | 26.68 | 27.82 | 29.55 | 441391                                                                                                                                                                                                  | 430RHP | 2X1X1.4X25X65X6   |
| 2                                   | 1                               | 70                                 | 1.70                                 | 30                                 | 6                                  | 1.92                            | 3.303                                       | 1.4                        | 10                          | 3.24                                      | 4.63                                                                                                                                                       | 9.19  | 31.74 | 33.02 | 35.42 | 441392                                                                                                                                                                                                  | 430RHP | 2X1X1.4X30X70X6   |
| 2                                   | 1                               | 80                                 | 1.70                                 | 40                                 | 6                                  | 1.92                            | 3.792                                       | 1.4                        | 10                          | 2.60                                      | 4.63                                                                                                                                                       | 9.19  | 41.85 | 43.36 | 35.42 | 441393                                                                                                                                                                                                  | 430RHP | 2X1X1.4X40X80X6   |
| 2                                   | 1                               | 55                                 | 1.70                                 | 12                                 | 6                                  | 1.92                            | 2.964                                       | 2.9                        | 7                           | 6.30                                      | 2.80                                                                                                                                                       | 3.27  | 4.09  | 5.83  | 13.57 | 441394                                                                                                                                                                                                  | 430RHP | 2X1X2.9X12X55X6   |
| 2                                   | 1                               | 60                                 | 1.70                                 | 15                                 | 6                                  | 1.92                            | 3.267                                       | 2.9                        | 7                           | 5.60                                      | 2.80                                                                                                                                                       | 3.27  | 4.09  | 5.83  | 16.59 | 441395                                                                                                                                                                                                  | 430RHP | 2X1X2.9X15X60X6   |
| 2                                   | 1                               | 65                                 | 1.70                                 | 20                                 | 6                                  | 1.92                            | 3.774                                       | 2.9                        | 10                          | 4.72                                      | 2.80                                                                                                                                                       | 3.27  | 4.09  | 5.83  | 22.08 | 441396                                                                                                                                                                                                  | 430RHP | 2X1X2.9X20X65X6   |
| 3                                   | 1.5                             | 55                                 | 2.50                                 | 16                                 | 6                                  | 2.86                            | 3.048                                       | 0.4                        | 7                           | 4.01                                      | 17.25                                                                                                                                                      | 17.89 | 18.38 | 18.79 | 20.60 | 441398                                                                                                                                                                                                  | 430RHP | 3X1.5X.4X16X55X6  |
| 3                                   | 1.5                             | 60                                 | 2.50                                 | 20                                 | 6                                  | 2.86                            | 3.104                                       | 0.4                        | 7                           | 3.40                                      | 21.29                                                                                                                                                      | 22.04 | 22.60 | 23.34 | 25.74 | 441399                                                                                                                                                                                                  | 430RHP | 3X1.5X.4X20X60X6  |
| 3                                   | 1.5                             | 70                                 | 2.50                                 | 30                                 | 6                                  | 2.86                            | 3.244                                       | 0.4                        | 10                          | 2.46                                      | 31.67                                                                                                                                                      | 32.88 | 33.73 | 34.92 | 25.74 | 441400                                                                                                                                                                                                  | 430RHP | 3X1.5X.4X30X70X6  |
| 3                                   | 1.5                             | 80                                 | 2.50                                 | 40                                 | 6                                  | 2.86                            | 3.384                                       | 0.4                        | 10                          | 1.93                                      | 41.78                                                                                                                                                      | 43.23 | 44.38 | 34.92 | 25.74 | 441401                                                                                                                                                                                                  | 430RHP | 3X1.5X.4X40X80X6  |
| 3                                   | 1.5                             | 90                                 | 2.50                                 | 50                                 | 6                                  | 2.86                            | 3523                                        | 0.4                        | 10                          | 1.59                                      | 51.87                                                                                                                                                      | 53.53 | 55.41 | 34.92 | 25.74 | 441402                                                                                                                                                                                                  | 430RHP | 3X1.5X.4X50X90X6  |
| 3                                   | 1.5                             | 50                                 | 2.50                                 | 8                                  | 6                                  | 2.86                            | 2.937                                       | 0.4                        | 4                           | 6.25                                      | 8.87                                                                                                                                                       | 9.13  | 9.35  | 9.55  | 10.33 | 441397                                                                                                                                                                                                  | 430RHP | 3X1.5X.4X8X50X6   |
| 3                                   | 1.5                             | 120                                | 2.50                                 | 80                                 | 6                                  | 2.86                            | 3.942                                       | 0.4                        | 10                          | 1.04                                      | 82.14                                                                                                                                                      | 84.60 | 55.41 | 34.92 | 25.74 | 441403                                                                                                                                                                                                  | 430RHP | 3X1.5X.4X80X120X6 |
| 3                                   | 1.5                             | 55                                 | 2.50                                 | 15                                 | 6                                  | 2.86                            | 3.253                                       | 0.9                        | 7                           | 4.30                                      | 13.78                                                                                                                                                      | 16.35 | 16.95 | 17.41 | 18.64 | 441404                                                                                                                                                                                                  | 430RHP | 3X1.5X.9X15X55X6  |
| 3                                   | 1.5                             | 60                                 | 2.50                                 | 20                                 | 6                                  | 2.86                            | 3.410                                       | 0.9                        | 7                           | 3.50                                      | 13.78                                                                                                                                                      | 21.40 | 22.14 | 22.68 | 24.78 | 441405                                                                                                                                                                                                  | 430RHP | 3X1.5X.9X20X60X6  |
| 3                                   | 1.5                             | 70                                 | 2.50                                 | 30                                 | 6                                  | 2.86                            | 3.724                                       | 0.9                        | 10                          | 2.54                                      | 13.78                                                                                                                                                      | 31.82 | 33.00 | 33.84 | 24.78 | 441406                                                                                                                                                                                                  | 430RHP | 3X1.5X.9X30X70X6  |
| 3                                   | 1.5                             | 75                                 | 2.50                                 | 35                                 | 6                                  | 2.86                            | 3.881                                       | 0.9                        | 10                          | 2.24                                      | 13.78                                                                                                                                                      | 36.87 | 38.18 | 39.11 | 24.78 | 441407                                                                                                                                                                                                  | 430RHP | 3X1.5X.9X35X75X6  |
| 3                                   | 1.5                             | 80                                 | 2.50                                 | 40                                 | 6                                  | 2.86                            | 4.038                                       | 0.9                        | 10                          | 2.00                                      | 13.78                                                                                                                                                      | 41.92 | 43.34 | 39.11 | 24.78 | 441408                                                                                                                                                                                                  | 430RHP | 3X1.5X.9X40X80X6  |
| 3                                   | 1.5                             | 90                                 | 2.50                                 | 50                                 | 6                                  | 2.86                            | 4.352                                       | 0.9                        | 10                          | 1.64                                      | 13.78                                                                                                                                                      | 52.01 | 53.64 | 39.11 | 24.78 | 441409                                                                                                                                                                                                  | 430RHP | 3X1.5X.9X50X90X6  |
| 3                                   | 1.5                             | 100                                | 2.50                                 | 60                                 | 6                                  | 2.86                            | 4.667                                       | 0.9                        | 10                          | 1.39                                      | 13.78                                                                                                                                                      | 62.10 | 53.64 | 39.11 | 24.78 | 441410                                                                                                                                                                                                  | 430RHP | 3X1.5X.9X60X100X6 |
| 3                                   | 1.5                             | 110                                | 2.50                                 | 70                                 | 6                                  | 2.86                            | 4.981                                       | 0.9                        | 10                          | 1.20                                      | 13.78                                                                                                                                                      | 72.19 | 53.64 | 39.11 | 24.78 | 441411                                                                                                                                                                                                  | 430RHP | 3X1.5X.9X70X110X6 |
| 3                                   | 1.5                             | 130                                | 2.50                                 | 90                                 | 6                                  | 2.86                            | 5.609                                       | 0.9                        | 10                          | 0.95                                      | 13.78                                                                                                                                                      | 72.19 | 53.64 | 39.11 | 24.78 | 441412                                                                                                                                                                                                  | 430RHP | 3X1.5X.9X90X130X6 |
| 3                                   | 1.5                             | 70                                 | 2.50                                 | 30                                 | 6                                  | 2.86                            | 4.204                                       | 1.4                        | 10                          | 2.63                                      | 7.51                                                                                                                                                       | 15.05 | 31.97 | 33.13 | 24.78 | 441413                                                                                                                                                                                                  | 430RHP | 3X1.5X1.4X30X70X6 |
| 3                                   | 1.5                             | 80                                 | 2.50                                 | 40                                 | 6                                  | 2.86                            | 4.693                                       | 1.4                        | 10                          | 2.05                                      | 7.51                                                                                                                                                       | 15.05 | 42.06 | 43.46 | 24.78 | 441414                                                                                                                                                                                                  | 430RHP | 3X1.5X1.4X40X80X6 |
| 3                                   | 1.5                             | 90                                 | 2.50                                 | 50                                 | 6                                  | 2.86                            | 5.182                                       | 1.4                        | 10                          | 1.68                                      | 7.51                                                                                                                                                       | 15.05 | 52.16 | 43.46 | 24.78 | 441415                                                                                                                                                                                                  | 430RHP | 3X1.5X1.4X50X90X6 |
| 4                                   | 2                               | 110                                | 8.00                                 | 60                                 | 8                                  | 3.86                            | 4.586                                       | 0.4                        | 10                          | 1.74                                      | 62.14                                                                                                                                                      | 63.88 | 66.58 | 43.46 | 24.78 | 441416                                                                                                                                                                                                  | 430RHP | 4X2X.4X60X110X8   |
| 4                                   | 2                               | 70                                 | 8.00                                 | 20                                 | 8                                  | 3.86                            | 4.237                                       | 0.9                        | 7                           | 4.26                                      | 20.79                                                                                                                                                      | 21.76 | 22.37 | 22.87 | 25.16 | 441417                                                                                                                                                                                                  | 430RHP | 4X2X.9X20X70X8    |
| 4                                   | 2                               | 80                                 | 8.00                                 | 30                                 | 8                                  | 3.86                            | 4.551                                       | 0.9                        | 7                           | 3.17                                      | 25.53                                                                                                                                                      | 31.83 | 32.66 | 33.95 | 37.45 | 441418                                                                                                                                                                                                  | 430RHP | 4X2X.9X30X80X8    |
| 4                                   | 2                               | 85                                 | 8.00                                 | 35                                 | 8                                  | 3.86                            | 4.708                                       | 0.9                        | 7                           | 2.82                                      | 25.53                                                                                                                                                      | 36.87 | 37.79 | 39.50 | 37.45 | 441419                                                                                                                                                                                                  | 430RHP | 4X2X.9X35X85X8    |
| 4                                   | 2                               | 90                                 | 8.00                                 | 40                                 | 8                                  | 3.86                            | 4.865                                       | 0.9                        | 7                           | 2.53                                      | 25.53                                                                                                                                                      | 42.31 | 43.56 | 45.04 | 37.45 | 441420                                                                                                                                                                                                  | 430RHP | 4X2X.9X40X90X8    |
| 4                                   | 2                               | 100                                | 8.00                                 | 50                                 | 8                                  | 3.86                            | 5.180                                       | 0.9                        | 7                           | 2.10                                      | 25.53                                                                                                                                                      | 52.39 | 53.84 | 56.12 | 37.45 | 441421                                                                                                                                                                                                  | 430RHP | 4X2X.9X50X100X8   |
| 4                                   | 2                               | 110                                | 8.00                                 | 60                                 | 8                                  | 3.86                            | 5.494                                       | 0.9                        | 7                           | 1.80                                      | 25.53                                                                                                                                                      | 62.46 | 64.14 | 56.12 | 37.45 | 441422                                                                                                                                                                                                  | 430RHP | 4X2X.9X60X110X8   |
| 4                                   | 2                               | 95                                 | 8.00                                 | 45                                 | 8                                  | 3.86                            | 5.669                                       | 1.4                        | 7                           | 2.37                                      | 15.79                                                                                                                                                      | 33.06 | 47.66 | 48.93 | 37.45 | 441423                                                                                                                                                                                                  | 430RHP | 4X2X1.4X45X95X8   |

La gamma prosegue nella pagina successiva | The range continues on the next page >>

| 430RHP                              |                                 |                                    |                                      |                                    |                                    |                                 |                                             |                            |                             |                                           |                                                                                                                                                            |       |       |       |       | 430RHP    |                               |                               |
|-------------------------------------|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---------------------------------|---------------------------------------------|----------------------------|-----------------------------|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-----------|-------------------------------|-------------------------------|
| Diametro fresa<br>End mill diameter | Raggio fresa<br>End mill radius | Lunghezza totale<br>Overall length | Lunghezza di taglio<br>Length of cut | Lunghezza utile<br>Length of reach | Diametro attacco<br>Shank diameter | Diametro collo<br>Neck diameter | Diametro sotto collo<br>Under Neck diameter | Angolo collo<br>Neck angle | Raggio collo<br>Radius neck | Angolo interferenza<br>Interference angle | Effettiva lunghezza<br>sotto collo,<br>per diversi gradi di<br>angolo di sforno.<br>The effective<br>under-neck length<br>for the various<br>draft angles. |       |       |       |       | ART. NUM. | Codice d'ordine<br>Order code | Prezzo utensile<br>Tool Price |
| d <sub>1</sub>                      | R                               | l <sub>1</sub>                     | l <sub>2</sub>                       | l <sub>3</sub>                     | d <sub>2</sub>                     | d <sub>3</sub>                  | d <sub>4</sub>                              | θ <sub>0n</sub>            | R <sub>1</sub>              | θ <sub>0k</sub>                           | 0,5°                                                                                                                                                       | 1°    | 1°5   | 2°    | 3°    |           |                               | €                             |
| 4                                   | 2                               | 130                                | 8.00                                 | 80                                 | 8                                  | 3.86                            | 7.379                                       | 1.4                        | 7                           | 1.43                                      | 15.79                                                                                                                                                      | 33.06 | 47.66 | 48.93 | 37.45 | 441424    | 430RHP 4X2X1.4X80X130X8       |                               |
| 4                                   | 2                               | 75                                 | 8.00                                 | 25                                 | 8                                  | 3.86                            | 5.582                                       | 2.9                        | 7                           | 3.99                                      | 10.91                                                                                                                                                      | 13.27 | 17.30 | 25.73 | 27.74 | 441425    | 430RHP 4X2X2.9X25X75X8        |                               |

## 1412HP

Z2

Frese a testa piana in metallo duro integrale micrograna.  
Square end mills in solid carbide micro grain.



|                                                                   | Acciai Temprati<br>Hardened Steels |                            |                        |                        |                           |                            |                        |                        |                           |                            |                        |                        |
|-------------------------------------------------------------------|------------------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|
| Durezza<br>Hardness                                               | 55 - 62 HRC                        |                            |                        |                        | 62 - 65 HRC               |                            |                        |                        | 65-68 HRC                 |                            |                        |                        |
| d <sub>1</sub>                                                    | n<br>(min <sup>-1</sup> )          | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |
| Valori in tabella per contornatura   Table value for side Milling |                                    |                            |                        |                        |                           |                            |                        |                        |                           |                            |                        |                        |

|    |        |     |    |      |        |     |     |      |        |     |     |      |
|----|--------|-----|----|------|--------|-----|-----|------|--------|-----|-----|------|
| 1  | 20.500 | 310 | 1  | 0,03 | 16.000 | 190 | 0,5 | 0,02 | 12.500 | 125 | 0,5 | 0,02 |
| 2  | 14.500 | 370 | 2  | 0,06 | 11.000 | 230 | 1,0 | 0,04 | 9.500  | 165 | 1,0 | 0,04 |
| 3  | 9.500  | 370 | 3  | 0,09 | 7.500  | 230 | 1,5 | 0,06 | 6.400  | 165 | 1,5 | 0,06 |
| 4  | 7.200  | 385 | 4  | 0,12 | 5.600  | 240 | 2,0 | 0,08 | 4.750  | 170 | 2,0 | 0,08 |
| 5  | 6.400  | 410 | 5  | 0,15 | 5.100  | 260 | 2,5 | 0,10 | 4.450  | 190 | 2,5 | 0,10 |
| 6  | 5.300  | 400 | 6  | 0,18 | 4.200  | 255 | 3,0 | 0,12 | 3.700  | 185 | 3,0 | 0,12 |
| 8  | 4.000  | 365 | 8  | 0,24 | 3.200  | 235 | 4,0 | 0,16 | 2.800  | 170 | 4,0 | 0,16 |
| 10 | 3.200  | 340 | 10 | 0,30 | 2.550  | 220 | 5,0 | 0,20 | 2.200  | 160 | 5,0 | 0,20 |
| 12 | 2.650  | 340 | 12 | 0,36 | 2.100  | 220 | 6,0 | 0,24 | 1.860  | 160 | 6,0 | 0,24 |

- Per cave: valori (a<sub>p</sub> ≤ 0,05xD) (a<sub>e</sub> 1xD) mantenendo giri e avanzamento riportati in tabella. Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti.
- For slot milling: values (a<sub>p</sub> ≤ 0,05D) (a<sub>e</sub> 1xD), maintaining the RPM and feed shown in the table. Contact the technical department for more details on the missing diameters.

## 1414HP

Z4

Frese a testa piana in metallo duro integrale micrograna.  
Square end mills in solid carbide micro grain.



|                                                                   | Acciai Temprati<br>Hardened Steels |                            |                        |                        |                           |                            |                        |                        |                           |                            |                        |                        |
|-------------------------------------------------------------------|------------------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|
| Durezza<br>Hardness                                               | ≤ 45 HRC                           |                            |                        |                        | ≤ 55 HRC                  |                            |                        |                        | 55 - 68 HRC               |                            |                        |                        |
| d <sub>1</sub>                                                    | n<br>(min <sup>-1</sup> )          | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |
| Valori in tabella per contornatura   Table value for side Milling |                                    |                            |                        |                        |                           |                            |                        |                        |                           |                            |                        |                        |

|     |        |       |       |       |        |       |      |       |        |     |      |       |
|-----|--------|-------|-------|-------|--------|-------|------|-------|--------|-----|------|-------|
| 1   | 40.000 | 2.800 | 0,060 | 0,030 | 32.000 | 2.300 | 0,06 | 0,030 | 16.000 | 680 | 0,05 | 0,030 |
| 1,5 | 40.000 | 4.300 | 0,120 | 0,045 | 32.000 | 3.300 | 0,08 | 0,045 | 10.600 | 600 | 0,08 | 0,045 |
| 2   | 30.000 | 4.300 | 0,180 | 0,060 | 24.000 | 3.300 | 0,10 | 0,060 | 8.100  | 480 | 0,10 | 0,060 |
| 2,5 | 24.000 | 3.700 | 0,250 | 0,075 | 19.000 | 2.800 | 0,13 | 0,075 | 6.400  | 430 | 0,13 | 0,075 |
| 3   | 20.000 | 3.300 | 0,300 | 0,150 | 16.000 | 2.500 | 0,15 | 0,150 | 5.400  | 360 | 0,15 | 0,150 |
| 4   | 15.000 | 2.800 | 0,400 | 0,200 | 12.000 | 2.200 | 0,20 | 0,200 | 4.000  | 430 | 0,20 | 0,200 |
| 5   | 12.000 | 2.200 | 0,500 | 0,250 | 9.000  | 1.600 | 0,25 | 0,250 | 3.200  | 360 | 0,20 | 0,250 |
| 6   | 10.000 | 1.900 | 0,600 | 0,300 | 7.000  | 1.200 | 0,30 | 0,300 | 2.700  | 300 | 0,20 | 0,300 |
| 8   | 8.000  | 1.300 | 0,800 | 0,400 | 5.600  | 1.000 | 0,40 | 0,400 | 2.000  | 220 | 0,20 | 0,400 |
| 10  | 6.400  | 1.200 | 1,000 | 0,500 | 4.500  | 900   | 0,50 | 0,500 | 1.600  | 190 | 0,30 | 0,500 |
| 12  | 6.400  | 1.000 | 1,000 | 0,500 | 3.800  | 800   | 0,50 | 0,500 | 1.300  | 150 | 0,30 | 0,500 |

- Per cave: valori (a<sub>p</sub> - n - V<sub>f</sub> riportati in tabella) per (a<sub>e</sub> 1xD), mantenendo giri e avanzamento riportati in tabella. Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti.
- For slot milling: values (a<sub>p</sub> - n - V<sub>f</sub> shown in table) for (a<sub>e</sub> 1xD), maintaining the RPM and feed shown in the table. Contact the technical department for more details on the missing diameters.

## 14145HP

Z4

Frese a testa piana in metallo duro integrale micrograna.  
Square end mills in solid carbide micro grain.



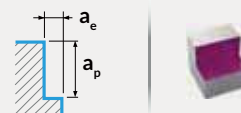
| Durezza<br>Hardness | Acciai Temprati<br>Hardened Steels |                            |                        |                        |                           |                            |                        |                        |
|---------------------|------------------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|
|                     | 55 - 62 HRC                        |                            |                        |                        | 62 - 68 HRC               |                            |                        |                        |
| d <sub>1</sub>      | n<br>(min <sup>-1</sup> )          | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |
| 1                   | 32.000                             | 800                        | 0,500                  | 0.020                  | 28.000                    | 500                        | 0,500                  | 0.020                  |
| 1,5                 | 30.000                             | 900                        | 0,500                  | 0.020                  | 25.000                    | 550                        | 0,500                  | 0.020                  |
| 2                   | 24.000                             | 1.000                      | 0,500                  | 0.020                  | 16.000                    | 600                        | 0,500                  | 0.020                  |
| 2,5                 | 31.200                             | 2.780                      | 0,500                  | 0.020                  | 15.600                    | 1.440                      | 0,500                  | 0.020                  |
| 3                   | 38.400                             | 4.560                      | 0,500                  | 0.020                  | 15.200                    | 2.280                      | 0,500                  | 0.020                  |
| 4                   | 28.800                             | 5.280                      | 0,500                  | 0.020                  | 14.400                    | 2.640                      | 0,500                  | 0.020                  |
| 5                   | 24.000                             | 6.000                      | 0,500                  | 0.020                  | 12.000                    | 3.000                      | 0,500                  | 0.020                  |
| 6                   | 19.200                             | 6.960                      | 0,500                  | 0.020                  | 9.600                     | 3.480                      | 0,500                  | 0.020                  |
| 8                   | 14.400                             | 6.960                      | 0,500                  | 0.020                  | 7.200                     | 3.480                      | 0,500                  | 0.020                  |
| 10                  | 11.520                             | 6.960                      | 0,500                  | 0.020                  | 5.760                     | 3.480                      | 0,500                  | 0.020                  |
| 12                  | 9.600                              | 5.760                      | 0,500                  | 0.020                  | 4.800                     | 2.880                      | 0,500                  | 0.020                  |
| 14                  | 8.400                              | 5.040                      | 0,500                  | 0.020                  | 4.200                     | 2.520                      | 0,500                  | 0.020                  |
| 16                  | 7.200                              | 4.320                      | 0,500                  | 0.020                  | 3.600                     | 2.160                      | 0,500                  | 0.020                  |
| 20                  | 5.760                              | 3.480                      | 0,500                  | 0.020                  | 2.880                     | 1.680                      | 0,500                  | 0.020                  |

- Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

## 1416HP

Z6

Frese a testa piana in metallo duro integrale micrograna.  
Square end mills in solid carbide micro grain.



| Durezza<br>Hardness | Acciai ≤1100 N/mm <sup>2</sup><br>Steels ≤1100 N/mm <sup>2</sup> |                            |                        |                        | Acciai Temprati<br>Hardened Steels |                            |                        |                        |                           |                            |                        |                        |                           |                            |                        |                        |
|---------------------|------------------------------------------------------------------|----------------------------|------------------------|------------------------|------------------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|
|                     |                                                                  |                            |                        |                        | ≤ 45 HRC                           |                            |                        |                        | ≤ 55 HRC                  |                            |                        |                        | 55 - 68 HRC               |                            |                        |                        |
| d <sub>1</sub>      | n<br>(min <sup>-1</sup> )                                        | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> )          | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |
| 6                   | 3.180                                                            | 1.530                      | 18                     | 0,06                   | 2.650                              | 640                        | 18                     | 0,06                   | 2.650                     | 480                        | 18                     | 0,06                   | 2.120                     | 380                        | 18                     | 0,06                   |
| 8                   | 2.390                                                            | 1.510                      | 24                     | 0,08                   | 1.990                              | 600                        | 24                     | 0,08                   | 1.990                     | 480                        | 24                     | 0,08                   | 1.590                     | 380                        | 24                     | 0,08                   |
| 10                  | 1.910                                                            | 1.380                      | 30                     | 0,10                   | 1.590                              | 570                        | 30                     | 0,10                   | 1.590                     | 480                        | 30                     | 0,10                   | 1.270                     | 380                        | 30                     | 0,10                   |
| 12                  | 1.590                                                            | 1.240                      | 36                     | 0,12                   | 1.320                              | 550                        | 36                     | 0,12                   | 1.320                     | 480                        | 36                     | 0,12                   | 1.060                     | 380                        | 36                     | 0,12                   |
| 16                  | 1.190                                                            | 1.040                      | 48                     | 0,16                   | 990                                | 480                        | 48                     | 0,16                   | 990                       | 420                        | 48                     | 0,16                   | 800                       | 340                        | 48                     | 0,16                   |
| 20                  | 760                                                              | 970                        | 60                     | 0,20                   | 640                                | 460                        | 60                     | 0,20                   | 640                       | 410                        | 60                     | 0,20                   | 510                       | 330                        | 60                     | 0,20                   |

- Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

## 1430HP

Z2

Frese a testa piana con scarico in Metallo Duro Integrale micrograna.  
Square end mills long neck in solid carbide micro grain.



|                                                                   | Acciai $\leq 1100 \text{ N/mm}^2$<br>Steels $\leq 1100 \text{ N/mm}^2$ |                              |                          |                          | Acciai Temprati<br>Hardened Steels |                              |                          |                          |                            |                              |                          |                          |                            |                              |                          |                          |
|-------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------|--------------------------|--------------------------|------------------------------------|------------------------------|--------------------------|--------------------------|----------------------------|------------------------------|--------------------------|--------------------------|----------------------------|------------------------------|--------------------------|--------------------------|
| Durezza<br>Hardness                                               |                                                                        |                              |                          |                          | $\leq 45 \text{ HRc}$              |                              |                          |                          | $\leq 55 \text{ HRc}$      |                              |                          |                          | 55 - 68 HRc                |                              |                          |                          |
| $d_1 + l_3$                                                       | n<br>( $\text{min}^{-1}$ )                                             | $V_f$<br>( $\text{mm/min}$ ) | $a_p$<br>( $\text{mm}$ ) | $a_e$<br>( $\text{mm}$ ) | n<br>( $\text{min}^{-1}$ )         | $V_f$<br>( $\text{mm/min}$ ) | $a_p$<br>( $\text{mm}$ ) | $a_e$<br>( $\text{mm}$ ) | n<br>( $\text{min}^{-1}$ ) | $V_f$<br>( $\text{mm/min}$ ) | $a_p$<br>( $\text{mm}$ ) | $a_e$<br>( $\text{mm}$ ) | n<br>( $\text{min}^{-1}$ ) | $V_f$<br>( $\text{mm/min}$ ) | $a_p$<br>( $\text{mm}$ ) | $a_e$<br>( $\text{mm}$ ) |
| Valori in tabella per contornatura   Table value for side Milling |                                                                        |                              |                          |                          |                                    |                              |                          |                          |                            |                              |                          |                          |                            |                              |                          |                          |

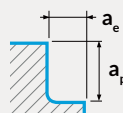
|     |     |        |       |       |       |        |     |       |       |        |     |       |       |        |     |       |       |
|-----|-----|--------|-------|-------|-------|--------|-----|-------|-------|--------|-----|-------|-------|--------|-----|-------|-------|
| 0,1 | 0,3 | 30.000 | 15    | 0,004 | -     | 30.000 | 16  | 0,002 | -     | -      | -   | -     | -     | -      | -   | -     | -     |
| 0,2 | 0,5 | 56.000 | 310   | 0,005 | 0,090 | 56.000 | 270 | 0,003 | 0,090 | 44.800 | 180 | 0,002 | 0,090 | 15.000 | 10  | 0,001 | 0,090 |
| 0,3 | 1   | 60.000 | 500   | 0,008 | 0,060 | 60.000 | 400 | 0,006 | 0,060 | 52.100 | 330 | 0,004 | 0,060 | 14.600 | 14  | 0,003 | 0,060 |
| 0,4 | 1   | 57.700 | 640   | 0,010 | 0,025 | 48.100 | 470 | 0,008 | 0,025 | 38.500 | 320 | 0,005 | 0,025 | 14.300 | 17  | 0,003 | 0,025 |
| 0,5 | 2   | 54.000 | 760   | 0,016 | 0,070 | 40.600 | 510 | 0,014 | 0,070 | 32.500 | 350 | 0,010 | 0,070 | 14.000 | 20  | 0,005 | 0,070 |
| 1   | 10  | 16.200 | 400   | 0,009 | 0,009 | 13.800 | 300 | 0,007 | 0,009 | 11.000 | 210 | 0,005 | 0,009 | 6.500  | 12  | 0,003 | 0,009 |
| 1,5 | 10  | 22.100 | 1.000 | 0,065 | 0,040 | 16.300 | 640 | 0,051 | 0,040 | 13.000 | 440 | 0,036 | 0,040 | 9.600  | 95  | 0,020 | 0,040 |
| 2   | 10  | 12.600 | 700   | 0,040 | 0,100 | 9.700  | 470 | 0,031 | 0,100 | 7.800  | 330 | 0,022 | 0,100 | 9.600  | 45  | 0,013 | 0,100 |
| 2,5 | 10  | 11.100 | 860   | 0,061 | 0,600 | 8.600  | 590 | 0,048 | 0,600 | 6.900  | 400 | 0,034 | 0,600 | 9.600  | 116 | 0,020 | 0,600 |
| 3   | 10  | 9.600  | 930   | 0,083 | 0,750 | 7.200  | 620 | 0,064 | 0,750 | 5.800  | 430 | 0,046 | 0,750 | 8.000  | 222 | 0,027 | 0,750 |
| 4   | 10  | 8.000  | 1.000 | 0,120 | 1,300 | 5.900  | 690 | 0,085 | 1,300 | 4.700  | 460 | 0,066 | 1,300 | 6.000  | 420 | 0,040 | 1,300 |
| 5   | 30  | 3.400  | 510   | 0,085 | 0,200 | 2.500  | 340 | 0,066 | 0,200 | 2.000  | 230 | 0,047 | 0,200 | 4.800  | 69  | 0,028 | 0,200 |
| 6   | 40  | 2.300  | 410   | 0,074 | 0,170 | 1.700  | 260 | 0,058 | 0,170 | 1.300  | 170 | 0,041 | 0,170 | 4.000  | 75  | 0,024 | 0,170 |
| 8   | 40  | 2.000  | 410   | 0,100 | 0,200 | 1.500  | 250 | 0,800 | 0,200 | 1.100  | 160 | 0,060 | 0,200 | 3.400  | 84  | 0,035 | 0,200 |

- Per cave: valori ( $a_p$  - n -  $V_f$  riportati in tabella) per ( $a_e$  1xD), mantenendo giri e avanzamento riportati in tabella. Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti.
- For slot milling: values ( $a_p$  - n -  $V_f$  shown in table) for ( $a_e$  1xD), maintaining the RPM and feed shown in the table. Contact the technical department for more details on the missing diameters.

## 1432HP

Z2

Frese toriche in metallo duro integrale micrograna.  
Corner radius end mills in solid carbide micro grain.



|                     |     | Acciai Temprati<br>Hardened Steels |                            |                        |                        |                           |                            |                        |                        |                           |                            |                        |                        |
|---------------------|-----|------------------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|
| Durezza<br>Hardness |     | 55 - 62 HRc                        |                            |                        |                        | 62 - 65 HRc               |                            |                        |                        | 65-68 HRc                 |                            |                        |                        |
| d <sub>1</sub> + R  |     | n<br>(min <sup>-1</sup> )          | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |
| 0,8                 | 0,2 | 25.000                             | 100                        | 0,04                   | 0,15                   | 19.000                    | 65                         | 0,02                   | 0,12                   | 16.000                    | 40                         | 0,02                   | 0,12                   |
| 1                   | 0,3 | 20.500                             | 248                        | 0,10                   | 0,30                   | 16.000                    | 152                        | 0,05                   | 0,20                   | 12.500                    | 100                        | 0,05                   | 0,20                   |
| 1,5                 | 0,1 | 16.500                             | 265                        | 0,12                   | 0,35                   | 13.000                    | 168                        | 0,07                   | 0,30                   | 10.500                    | 118                        | 0,07                   | 0,30                   |
| 2                   | 0,1 | 14.500                             | 296                        | 0,15                   | 0,40                   | 11.000                    | 184                        | 0,10                   | 0,35                   | 9.500                     | 132                        | 0,10                   | 0,30                   |
| 3                   | 0,1 | 9.500                              | 300                        | 0,20                   | 0,50                   | 7.500                     | 188                        | 0,15                   | 0,55                   | 6.400                     | 134                        | 0,12                   | 0,45                   |
|                     | 0,5 | 9.500                              | 300                        | 0,22                   | 0,50                   | 7.500                     | 188                        | 0,15                   | 0,55                   | 6.400                     | 134                        | 0,12                   | 0,45                   |
|                     | 1   | 9.500                              | 300                        | 0,25                   | 0,70                   | 7.500                     | 188                        | 0,20                   | 0,65                   | 6.400                     | 134                        | 0,16                   | 0,55                   |
| 4                   | 0,1 | 7.200                              | 308                        | 0,25                   | 0,95                   | 5.600                     | 192                        | 0,15                   | 0,75                   | 4.750                     | 136                        | 0,15                   | 0,65                   |
|                     | 0,5 | 7.200                              | 308                        | 0,25                   | 0,95                   | 5.600                     | 192                        | 0,15                   | 0,75                   | 4.750                     | 136                        | 0,15                   | 0,65                   |
|                     | 1   | 7.200                              | 308                        | 0,30                   | 1,20                   | 5.600                     | 192                        | 0,20                   | 1,00                   | 4.750                     | 136                        | 0,20                   | 0,90                   |
| 5                   | 0,1 | 6.400                              | 328                        | 0,20                   | 0,90                   | 5.100                     | 208                        | 0,15                   | 0,70                   | 4.450                     | 152                        | 0,15                   | 0,85                   |
|                     | 0,5 | 6.400                              | 328                        | 0,20                   | 0,90                   | 5.100                     | 208                        | 0,15                   | 0,70                   | 4.450                     | 152                        | 0,15                   | 0,85                   |
|                     | 1   | 6.400                              | 328                        | 0,25                   | 1,10                   | 5.100                     | 208                        | 0,20                   | 0,90                   | 4.450                     | 152                        | 0,20                   | 1,00                   |
| 6                   | 0,5 | 5.300                              | 320                        | 0,30                   | 1,30                   | 4.200                     | 204                        | 0,20                   | 0,80                   | 3.700                     | 148                        | 0,20                   | 0,80                   |
|                     | 1   | 5.300                              | 320                        | 0,30                   | 1,30                   | 4.200                     | 204                        | 0,20                   | 0,80                   | 3.700                     | 148                        | 0,20                   | 0,80                   |
|                     | 2,5 | 5.300                              | 320                        | 0,30                   | 1,40                   | 4.200                     | 204                        | 0,25                   | 1,20                   | 3.700                     | 148                        | 0,25                   | 1,20                   |
| 8                   | 0,5 | 4.000                              | 292                        | 0,30                   | 1,70                   | 3.200                     | 188                        | 0,25                   | 1,35                   | 2.800                     | 136                        | 0,25                   | 1,35                   |
|                     | 1   | 4.000                              | 292                        | 0,30                   | 1,70                   | 3.200                     | 188                        | 0,25                   | 1,35                   | 2.800                     | 136                        | 0,25                   | 1,35                   |
|                     | 3   | 4.000                              | 292                        | 0,40                   | 2,00                   | 3.200                     | 188                        | 0,25                   | 1,50                   | 2.800                     | 136                        | 0,30                   | 1,40                   |
| 10                  | 0,5 | 3.200                              | 272                        | 0,50                   | 2,10                   | 2.550                     | 176                        | 0,30                   | 1,70                   | 2.200                     | 128                        | 0,30                   | 1,50                   |
|                     | 1   | 3.200                              | 272                        | 0,50                   | 2,10                   | 2.550                     | 176                        | 0,30                   | 1,70                   | 2.200                     | 128                        | 0,30                   | 1,50                   |
|                     | 2,5 | 3.200                              | 272                        | 0,60                   | 2,40                   | 2.550                     | 176                        | 0,30                   | 1,80                   | 2.200                     | 128                        | 0,30                   | 1,60                   |
| 12                  | 0,5 | 2.650                              | 272                        | 0,80                   | 2,50                   | 2.100                     | 176                        | 0,40                   | 2,00                   | 1.860                     | 128                        | 0,35                   | 1,80                   |
|                     | 1   | 2.650                              | 272                        | 0,80                   | 2,50                   | 2.100                     | 176                        | 0,40                   | 2,00                   | 1.860                     | 128                        | 0,35                   | 1,80                   |
|                     | 2   | 2.650                              | 272                        | 1,00                   | 2,60                   | 2.100                     | 176                        | 0,50                   | 2,10                   | 1.860                     | 128                        | 0,40                   | 2,00                   |
|                     | 3   | 2.650                              | 272                        | 1,00                   | 2,60                   | 2.100                     | 176                        | 0,50                   | 2,10                   | 1.860                     | 128                        | 0,40                   | 2,00                   |

• Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

## 1434HP

Z4

Frese toriche in metallo duro integrale micrograna.  
Corner radius end mills in solid carbide micro grain.



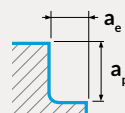
|                     |     | Acciai $\leq 1100 \text{ N/mm}^2$<br>Steels $\leq 1100 \text{ N/mm}^2$ |                              |                          |                          | Acciai Temprati<br>Hardened Steels |                              |                          |                          |                            |                              |                          |                          |
|---------------------|-----|------------------------------------------------------------------------|------------------------------|--------------------------|--------------------------|------------------------------------|------------------------------|--------------------------|--------------------------|----------------------------|------------------------------|--------------------------|--------------------------|
| Durezza<br>Hardness |     |                                                                        |                              |                          |                          | $\leq 55 \text{ HRc}$              |                              |                          |                          | 55 - 68 HRc                |                              |                          |                          |
| $d_1 + R$           |     | n<br>( $\text{min}^{-1}$ )                                             | $V_f$<br>( $\text{mm/min}$ ) | $a_p$<br>( $\text{mm}$ ) | $a_e$<br>( $\text{mm}$ ) | n<br>( $\text{min}^{-1}$ )         | $V_f$<br>( $\text{mm/min}$ ) | $a_p$<br>( $\text{mm}$ ) | $a_e$<br>( $\text{mm}$ ) | n<br>( $\text{min}^{-1}$ ) | $V_f$<br>( $\text{mm/min}$ ) | $a_p$<br>( $\text{mm}$ ) | $a_e$<br>( $\text{mm}$ ) |
| 3                   | 0,2 | 11.500                                                                 | 1.800                        | 0,082                    | 0,595                    | 10.700                             | 1.800                        | 0,051                    | 0,595                    | 9.100                      | 620                          | 0,038                    | 0,476                    |
| 4                   | 0,2 | 9.500                                                                  | 1.370                        | 0,091                    | 1,000                    | 7.900                              | 1.330                        | 0,071                    | 1,000                    | 9.400                      | 740                          | 0,043                    | 0,700                    |
| 6                   | 0,2 | 6.000                                                                  | 1.470                        | 0,153                    | 2,004                    | 3.500                              | 850                          | 0,153                    | 1,114                    | 3.000                      | 650                          | 0,060                    | 1,114                    |
| 8                   | 0,2 | 4.800                                                                  | 1.600                        | 0,184                    | 2,540                    | 2.900                              | 680                          | 0,184                    | 1,320                    | 2.400                      | 650                          | 0,087                    | 1,320                    |
| 10                  | 0,5 | 3.840                                                                  | 1.750                        | 0,210                    | 2,730                    | 2.300                              | 540                          | 0,220                    | 1,430                    | 1.900                      | 460                          | 0,094                    | 1,450                    |
| 12                  | 0,5 | 3.000                                                                  | 1.800                        | 0,230                    | 2,700                    | 1.800                              | 430                          | 0,240                    | 1,490                    | 1.600                      | 450                          | 0,110                    | 1,500                    |

• Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

## 1433HP

Z2

Frese toriche con scarico in Metallo Duro Integrale micrograna.  
Corner radius long neck end mills in solid carbide micro grain.



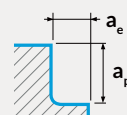
|                                     | Acciai ≤1100 N/mm²<br>Steels ≤1100 N/mm² |                            |                        |                        | Acciai Temprati<br>Hardened Steels |                            |                        |                        |                           |                            |                        |                        |
|-------------------------------------|------------------------------------------|----------------------------|------------------------|------------------------|------------------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|
| Durezza<br>Hardness                 |                                          |                            |                        |                        | ≤ 55 HRc                           |                            |                        |                        | 55 - 68 HRc               |                            |                        |                        |
| d <sub>1</sub> + R + I <sub>3</sub> | n<br>(min <sup>-1</sup> )                | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> )          | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |
| 0,2 0,02 1                          | 42.500                                   | 705                        | 0,006                  | 0,020                  | 37.500                             | 553                        | 0.004                  | 0.020                  | 35.000                    | 452                        | 0,001                  | 0,015                  |
| 0,5 0,1 3                           | 26.438                                   | 634                        | 0,022                  | 0,110                  | 23.328                             | 473                        | 0.020                  | 0.110                  | 21.773                    | 381                        | 0,008                  | 0,110                  |
| 0,8 0,1 8                           | 20.808                                   | 642                        | 0,005                  | 0,088                  | 18.360                             | 504                        | 0.004                  | 0.088                  | 17.136                    | 411                        | 0,002                  | 0,088                  |
| 1 0,1 10                            | 19.278                                   | 1.039                      | 0,011                  | 0,123                  | 17.010                             | 815                        | 0.013                  | 0.123                  | 15.876                    | 666                        | 0,006                  | 0,123                  |
| 1,5 0,5 20                          | 13.328                                   | 613                        | 0,005                  | 0,106                  | 11.760                             | 540                        | 0.006                  | 0.106                  | 10.976                    | 428                        | 0,003                  | 0,106                  |
| 2 0,5 20                            | 11.246                                   | 1.137                      | 0,017                  | 0,194                  | 9.923                              | 801                        | 0.023                  | 0.194                  | 9.261                     | 653                        | 0,014                  | 0,194                  |
| 2,5 0,5 30                          | 11.246                                   | 1.137                      | 0,011                  | 0,176                  | 9.923                              | 801                        | 0.016                  | 0.176                  | 9.261                     | 936                        | 0,010                  | 0,176                  |
| 3 0,5 30                            | 8.568                                    | 1.079                      | 0,049                  | 0,371                  | 7.560                              | 771                        | 0.049                  | 0.371                  | 7.056                     | 621                        | 0,028                  | 0,352                  |
| 4 1 30                              | 7.781                                    | 1.218                      | 0,028                  | 0,671                  | 6.866                              | 860                        | 0.041                  | 0.671                  | 6.408                     | 702                        | 0,030                  | 0,708                  |
| 5 1 20                              | 9.336                                    | 2.029                      | 0,106                  | 1,346                  | 8.237                              | 1.433                      | 0.150                  | 1.346                  | 7.688                     | 1.170                      | 0,110                  | 1,346                  |
| 6 1 20                              | 7.781                                    | 2.030                      | 0,476                  | 1,356                  | 6.866                              | 1.433                      | 0.186                  | 1.356                  | 6.408                     | 1.170                      | 0,145                  | 1,356                  |

• Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

## 14334HP

Z4

Frese toriche con scarico in Metallo Duro Integrale micrograna.  
Corner radius end mills long neck in solid carbide micro grain.



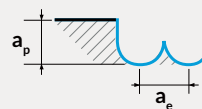
|                     |      | Acciai Temprati<br>Hardened Steels |                            |                        |                        |                           |                            |                        |                        |      |
|---------------------|------|------------------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|------|
| Durezza<br>Hardness |      | ≤ 55 HRc                           |                            |                        |                        | 55 - 68 HRc               |                            |                        |                        |      |
| $d_1 + R + I_3$     |      | n<br>(min <sup>-1</sup> )          | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |      |
| 1                   | 0,05 | 4                                  | 23.000                     | 1.800                  | 0,04                   | 0,30                      | 14.000                     | 1.000                  | 0,02                   | 0,20 |
|                     | 0,1  |                                    | 23.000                     | 1.800                  | 0,04                   | 0,30                      | 14.000                     | 1.000                  | 0,02                   | 0,20 |
|                     | 0,2  |                                    | 23.000                     | 1.800                  | 0,04                   | 0,30                      | 14.000                     | 1.000                  | 0,02                   | 0,20 |
|                     | 0,3  |                                    | 23.000                     | 1.800                  | 0,04                   | 0,30                      | 14.000                     | 1.000                  | 0,02                   | 0,20 |
| 1,5                 | 0,1  | 6                                  | 20.000                     | 1.600                  | 0,04                   | 0,40                      | 14.000                     | 1.000                  | 0,02                   | 0,20 |
|                     | 0,2  |                                    | 20.000                     | 1.600                  | 0,04                   | 0,40                      | 14.000                     | 1.000                  | 0,02                   | 0,20 |
|                     | 0,3  |                                    | 20.000                     | 1.600                  | 0,04                   | 0,40                      | 14.000                     | 1.000                  | 0,02                   | 0,20 |
|                     | 0,5  |                                    | 20.000                     | 1.600                  | 0,04                   | 0,40                      | 14.000                     | 1.000                  | 0,02                   | 0,20 |
| 2                   | 0,1  | 6                                  | 18.000                     | 1.800                  | 0,06                   | 0,60                      | 12.000                     | 1.200                  | 0,03                   | 0,30 |
|                     | 0,2  |                                    | 18.000                     | 1.800                  | 0,06                   | 0,60                      | 12.000                     | 1.200                  | 0,03                   | 0,30 |
|                     | 0,3  |                                    | 18.000                     | 1.800                  | 0,06                   | 0,60                      | 12.000                     | 1.200                  | 0,03                   | 0,30 |
|                     | 0,5  |                                    | 18.000                     | 1.800                  | 0,06                   | 0,60                      | 12.000                     | 1.200                  | 0,03                   | 0,30 |
| 2,5                 | 0,1  | 10                                 | 14.000                     | 1.600                  | 0,07                   | 0,70                      | 7.500                      | 1.000                  | 0,03                   | 0,50 |
|                     | 0,2  |                                    | 14.000                     | 1.600                  | 0,07                   | 0,70                      | 7.500                      | 1.000                  | 0,03                   | 0,50 |
|                     | 0,3  |                                    | 14.000                     | 1.600                  | 0,07                   | 0,70                      | 7.500                      | 1.000                  | 0,03                   | 0,50 |
|                     | 0,5  |                                    | 14.000                     | 1.600                  | 0,07                   | 0,70                      | 7.500                      | 1.000                  | 0,03                   | 0,50 |
| 3                   | 0,1  | 12                                 | 12.000                     | 1.600                  | 0,08                   | 0,80                      | 7.200                      | 1.000                  | 0,04                   | 0,50 |
|                     | 0,2  |                                    | 12.000                     | 1.600                  | 0,08                   | 0,80                      | 7.200                      | 1.000                  | 0,04                   | 0,50 |
|                     | 0,3  |                                    | 12.000                     | 1.600                  | 0,08                   | 0,80                      | 7.200                      | 1.000                  | 0,04                   | 0,50 |
|                     | 0,5  |                                    | 12.000                     | 1.600                  | 0,08                   | 0,80                      | 7.200                      | 1.000                  | 0,04                   | 0,50 |
|                     | 1    |                                    | 12.000                     | 1.600                  | 0,08                   | 0,80                      | 7.200                      | 1.000                  | 0,04                   | 0,50 |
|                     |      |                                    |                            |                        |                        |                           |                            |                        |                        |      |
| 4                   | 0,1  | 12                                 | 9.500                      | 2.200                  | 0,15                   | 1,20                      | 7.000                      | 1.400                  | 0,06                   | 0,80 |
|                     |      | 16                                 | 8.000                      | 1.800                  | 0,10                   | 1,00                      | 6.000                      | 1.200                  | 0,05                   | 0,60 |
|                     | 0,2  | 12                                 | 9.500                      | 2.200                  | 0,15                   | 1,20                      | 7.000                      | 1.400                  | 0,06                   | 0,80 |
|                     |      | 16                                 | 8.000                      | 1.800                  | 0,10                   | 1,00                      | 6.000                      | 1.200                  | 0,05                   | 0,60 |
|                     | 0,3  | 12                                 | 9.500                      | 2.200                  | 0,15                   | 1,20                      | 7.000                      | 1.400                  | 0,06                   | 0,80 |
|                     |      | 16                                 | 8.000                      | 1.800                  | 0,10                   | 1,00                      | 6.000                      | 1.200                  | 0,05                   | 0,60 |
|                     | 0,5  | 12                                 | 9.500                      | 2.200                  | 0,15                   | 1,20                      | 7.000                      | 1.400                  | 0,06                   | 0,80 |
|                     |      | 16                                 | 8.000                      | 1.800                  | 0,10                   | 1,00                      | 6.000                      | 1.200                  | 0,05                   | 0,60 |
|                     | 1    | 12                                 | 9.500                      | 2.200                  | 0,15                   | 1,20                      | 7.000                      | 1.400                  | 0,06                   | 0,80 |
|                     |      | 16                                 | 8.000                      | 1.800                  | 0,10                   | 1,00                      | 6.000                      | 1.200                  | 0,05                   | 0,60 |
|                     |      | 20                                 | 6.000                      | 1.500                  | 0,10                   | 2,00                      | 4.000                      | 1.000                  | 0,05                   | 1,00 |
|                     |      | 40                                 | 3.000                      | 850                    | 0,05                   | 1,00                      | 2.000                      | 500                    | 0,01                   | 0,30 |
| 5                   | 0,2  | 20                                 | 6.000                      | 1.500                  | 0,10                   | 2,00                      | 4.000                      | 1.000                  | 0,05                   | 1,00 |
|                     |      | 40                                 | 3.000                      | 850                    | 0,05                   | 1,00                      | 2.000                      | 500                    | 0,01                   | 0,30 |
|                     | 0,3  | 20                                 | 6.000                      | 1.500                  | 0,10                   | 2,00                      | 4.000                      | 1.000                  | 0,05                   | 1,00 |
|                     |      | 40                                 | 3.000                      | 850                    | 0,05                   | 1,00                      | 2.000                      | 500                    | 0,01                   | 0,30 |
|                     | 0,5  | 20                                 | 6.000                      | 1.500                  | 0,10                   | 2,00                      | 4.000                      | 1.000                  | 0,05                   | 1,00 |
|                     |      | 40                                 | 3.000                      | 850                    | 0,05                   | 1,00                      | 2.000                      | 500                    | 0,01                   | 0,30 |
|                     | 1    | 20                                 | 6.000                      | 1.500                  | 0,10                   | 2,00                      | 4.000                      | 1.000                  | 0,05                   | 1,00 |
|                     |      | 40                                 | 3.000                      | 850                    | 0,05                   | 1,00                      | 2.000                      | 500                    | 0,01                   | 0,30 |
|                     |      | 20                                 | 6.000                      | 1.500                  | 0,10                   | 2,00                      | 4.000                      | 1.000                  | 0,05                   | 1,00 |
|                     |      | 40                                 | 3.000                      | 850                    | 0,05                   | 1,00                      | 2.000                      | 500                    | 0,01                   | 0,30 |

• Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

## 416RHP

Z2

Frese sferiche in metallo duro integrale micrograna.  
Ball nose end mills in solid carbide micro grain.



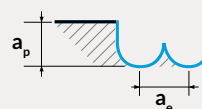
| Durezza<br>Hardness | Acciai Temprati<br>Hardened Steels |                            |                        |                        |                           |                            |                        |                        |                           |                            |                        |                        |                           |                            |                        |                        |
|---------------------|------------------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|
|                     | ≤ 55 HRc                           |                            |                        |                        | 55 - 62 HRc               |                            |                        |                        | 62 - 65 HRc               |                            |                        |                        | 65 - 68 HRc               |                            |                        |                        |
| R                   | n<br>(min <sup>-1</sup> )          | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |
| 0,1                 | 60.000                             | 180                        | 0,003                  | 0,005                  | 60.000                    | 180                        | 0,002                  | 0,003                  | 60.000                    | 120                        | 0,002                  | 0,003                  | 45.000                    | 60                         | 0,002                  | 0,003                  |
| 0,15                | 60.000                             | 330                        | 0,006                  | 0,008                  | 45.000                    | 300                        | 0,004                  | 0,007                  | 43.500                    | 160                        | 0,003                  | 0,003                  | 32.500                    | 80                         | 0,003                  | 0,005                  |
| 0,2                 | 50.000                             | 480                        | 0,010                  | 0,020                  | 37.500                    | 400                        | 0,007                  | 0,012                  | 35.000                    | 220                        | 0,005                  | 0,008                  | 26.250                    | 110                        | 0,005                  | 0,008                  |
| 0,25                | 44.000                             | 630                        | 0,015                  | 0,040                  | 33.000                    | 520                        | 0,010                  | 0,020                  | 30.000                    | 280                        | 0,007                  | 0,010                  | 22.500                    | 140                        | 0,007                  | 0,010                  |
| 0,3                 | 40.000                             | 1.000                      | 0,030                  | 0,130                  | 30.000                    | 1.100                      | 0,020                  | 0,100                  | 26.500                    | 700                        | 0,010                  | 0,075                  | 20.000                    | 380                        | 0,010                  | 0,075                  |
| 0,4                 | 35.000                             | 1.500                      | 0,060                  | 0,210                  | 27.000                    | 1.500                      | 0,040                  | 0,170                  | 23.500                    | 950                        | 0,020                  | 0,120                  | 17.500                    | 480                        | 0,020                  | 0,120                  |
| 0,5                 | 30.000                             | 1.600                      | 0,200                  | 0,400                  | 24.000                    | 1.800                      | 0,100                  | 0,30                   | 21.000                    | 1.600                      | 0,050                  | 0,200                  | 16.000                    | 800                        | 0,050                  | 0,200                  |
| 0,75                | 30.000                             | 2.400                      | 0,250                  | 0,550                  | 17.000                    | 1.800                      | 0,120                  | 0,400                  | 15.000                    | 1.600                      | 0,060                  | 0,290                  | 11.250                    | 850                        | 0,060                  | 0,290                  |
| 1,4                 | 28.000                             | 2.700                      | 0,300                  | 0,700                  | 14.000                    | 2.000                      | 0,150                  | 0,500                  | 12.250                    | 1.800                      | 0,080                  | 0,350                  | 9.200                     | 800                        | 0,080                  | 0,350                  |
| 1,25                | 21.000                             | 2.800                      | 0,400                  | 1,000                  | 10.500                    | 2.000                      | 0,200                  | 0,700                  | 9.200                     | 1.700                      | 0,120                  | 0,550                  | 6.900                     | 900                        | 0,120                  | 0,550                  |
| 2                   | 18.000                             | 3.000                      | 0,500                  | 1,300                  | 9.000                     | 2.100                      | 0,250                  | 0,950                  | 7.900                     | 1.800                      | 0,150                  | 0,750                  | 5.900                     | 900                        | 0,150                  | 0,750                  |
| 2,5                 | 15.600                             | 3.000                      | 0,500                  | 1,500                  | 7.800                     | 2.100                      | 0,250                  | 1,050                  | 6.800                     | 1.900                      | 0,160                  | 0,880                  | 5.100                     | 900                        | 0,150                  | 0,880                  |
| 3                   | 13.000                             | 3.300                      | 0,600                  | 1,800                  | 6.500                     | 2.300                      | 0,300                  | 0,300                  | 5.700                     | 2.000                      | 0,200                  | 1,000                  | 4.300                     | 1.000                      | 0,200                  | 1,000                  |
| 4                   | 9.500                              | 2.800                      | 0,700                  | 2,100                  | 5.200                     | 2.100                      | 0,400                  | 0,700                  | 4.500                     | 1.800                      | 0,250                  | 1,350                  | 3.400                     | 900                        | 0,250                  | 1,350                  |
| 5                   | 7.500                              | 2.300                      | 0,800                  | 2,500                  | 4.300                     | 2.800                      | 0,500                  | 2,100                  | 3.750                     | 1.600                      | 0,300                  | 1,700                  | 2.800                     | 850                        | 0,300                  | 1,700                  |
| 6                   | 6.200                              | 1.800                      | 0,900                  | 3,000                  | 3.600                     | 1.600                      | 0,600                  | 2,600                  | 3.150                     | 1.400                      | 0,350                  | 2,000                  | 2.350                     | 680                        | 0,350                  | 2,000                  |

• Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

## 431RHP

Z2

Frese sferiche con scarico in Metallo Duro Integrale micrograna.  
Ball nose long neck end mills in solid carbide micro grain.



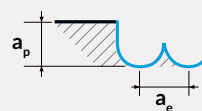
| Durezza<br>Hardness | Acciai Temprati<br>Hardened Steels |                            |                        |                        |                           |                            |                        |                        |                           |                            |                        |                        |                           |                            |                        |                        |
|---------------------|------------------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|---------------------------|----------------------------|------------------------|------------------------|
|                     | ≤ 55 HRc                           |                            |                        |                        | 55 - 62 HRc               |                            |                        |                        | 62 - 65 HRc               |                            |                        |                        | 65 - 68 HRc               |                            |                        |                        |
| R + I <sub>3</sub>  | n<br>(min <sup>-1</sup> )          | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) | n<br>(min <sup>-1</sup> ) | V <sub>f</sub><br>(mm/min) | a <sub>p</sub><br>(mm) | a <sub>e</sub><br>(mm) |
| 0,5 5               | 30.000                             | 1.600                      | 0,010                  | 0,30                   | 24.000                    | 1.800                      | 0,050                  | 0,20                   | 21.000                    | 1.600                      | 0,03                   | 0,17                   | 16.000                    | 800                        | 0,030                  | 0,17                   |
| 0,5 10              | 14.800                             | 320                        | 0,018                  | 0,13                   | 14.800                    | 400                        | 0,010                  | 0,09                   | 14.700                    | 320                        | 0,01                   | 0,09                   | 11.100                    | 160                        | 0,010                  | 0,09                   |
| 0,75 3              | 30.000                             | 2.450                      | 0,250                  | 0,55                   | 17.000                    | 1.800                      | 0,120                  | 0,40                   | 15.000                    | 1.600                      | 0,06                   | 0,29                   | 11.250                    | 850                        | 0,060                  | 0,29                   |
| 0,75 10             | 23.500                             | 1.200                      | 0,100                  | 0,35                   | 15.000                    | 1.100                      | 0,045                  | 0,25                   | 14.000                    | 1.000                      | 0,03                   | 0,21                   | 10.500                    | 500                        | 0,030                  | 0,21                   |
| 1 4                 | 28.000                             | 2.700                      | 0,300                  | 0,70                   | 14.000                    | 2.000                      | 0,150                  | 0,50                   | 12.250                    | 1.800                      | 0,08                   | 0,35                   | 9.200                     | 800                        | 0,080                  | 0,35                   |
| 1 10                | 28.000                             | 2.700                      | 0,200                  | 0,60                   | 14.000                    | 2.000                      | 0,100                  | 0,40                   | 12.250                    | 1.800                      | 0,06                   | 0,30                   | 9.200                     | 800                        | 0,060                  | 0,30                   |
| 1 20                | 8.650                              | 360                        | 0,035                  | 0,25                   | 8.650                     | 450                        | 0,020                  | 0,19                   | 8.560                     | 340                        | 0,02                   | 0,19                   | 6.400                     | 170                        | 0,020                  | 0,19                   |
| 1,5 10              | 21.000                             | 2.800                      | 0,300                  | 0,90                   | 10.500                    | 2.000                      | 0,150                  | 0,65                   | 9.200                     | 1.700                      | 0,10                   | 0,50                   | 6.900                     | 900                        | 0,100                  | 0,50                   |
| 1,5 20              | 14.500                             | 1.300                      | 0,180                  | 0,70                   | 9.250                     | 1.300                      | 0,100                  | 0,50                   | 8.400                     | 1.050                      | 0,75                   | 0,45                   | 6.450                     | 500                        | 0,075                  | 0,45                   |
| 2 20                | 18.000                             | 3.000                      | 0,400                  | 1,20                   | 9.000                     | 2.100                      | 0,200                  | 0,85                   | 7.900                     | 1.800                      | 0,13                   | 0,70                   | 5.900                     | 900                        | 0,130                  | 0,70                   |
| 2 30                | 7.000                              | 500                        | 0,100                  | 0,60                   | 7.000                     | 600                        | 0,060                  | 0,45                   | 7.000                     | 500                        | 0,06                   | 0,45                   | 5.250                     | 240                        | 0,060                  | 0,45                   |
| 3 15                | 13.000                             | 3.500                      | 0,600                  | 1,80                   | 6.500                     | 2.500                      | 0,300                  | 1,30                   | 5.700                     | 2.200                      | 0,20                   | 1,00                   | 4.300                     | 1.100                      | 0,200                  | 1,00                   |
| 4 25                | 9.500                              | 2.800                      | 0,700                  | 2,10                   | 5.200                     | 2.100                      | 0,400                  | 1,70                   | 4.500                     | 1.800                      | 0,25                   | 1,35                   | 3.400                     | 900                        | 0,250                  | 1,35                   |
| 5 30                | 7.500                              | 2.300                      | 0,800                  | 2,50                   | 4.300                     | 2.800                      | 0,500                  | 2,10                   | 3.750                     | 1.600                      | 0,30                   | 1,70                   | 2.800                     | 850                        | 0,300                  | 1,70                   |
| 6 30                | 6.200                              | 1.800                      | 0,900                  | 3,00                   | 3.600                     | 1.600                      | 0,600                  | 2,60                   | 3.150                     | 1.400                      | 0,35                   | 2,00                   | 2.350                     | 680                        | 0,350                  | 2,00                   |

- Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters

## 430RHP

Z2

Frese sferiche con scarico conico in metallo duro integrale micrograna.  
Ball nose tapered neck end mills in solid carbide micro grain



| Durezza<br>Hardness | Acciai $\leq 1300 \text{ N/mm}^2$<br>Steels $\leq 1300 \text{ N/mm}^2$ |                              |                          |                          | Acciai Temprati<br>Hardened Steels |                              |                          |                          |                            |                              |                          |                          |
|---------------------|------------------------------------------------------------------------|------------------------------|--------------------------|--------------------------|------------------------------------|------------------------------|--------------------------|--------------------------|----------------------------|------------------------------|--------------------------|--------------------------|
|                     |                                                                        |                              |                          |                          | $\leq 55 \text{ HRc}$              |                              |                          |                          | 55 - 68 HRc                |                              |                          |                          |
| $R + I_3$           | n<br>( $\text{min}^{-1}$ )                                             | $V_f$<br>( $\text{mm/min}$ ) | $a_p$<br>( $\text{mm}$ ) | $a_e$<br>( $\text{mm}$ ) | n<br>( $\text{min}^{-1}$ )         | $V_f$<br>( $\text{mm/min}$ ) | $a_p$<br>( $\text{mm}$ ) | $a_e$<br>( $\text{mm}$ ) | n<br>( $\text{min}^{-1}$ ) | $V_f$<br>( $\text{mm/min}$ ) | $a_p$<br>( $\text{mm}$ ) | $a_e$<br>( $\text{mm}$ ) |
| 0,5 8               | 17.000                                                                 | 1.300                        | 0,035                    | $\leq 0.1D$              | 17.000                             | 1.000                        | 0,030                    | $\leq 0.08D$             | 16.000                     | 820                          | 0,025                    | $\leq 0.06D$             |
| 1 20                | 9.000                                                                  | 1.000                        | 0,050                    | $\leq 0.1D$              | 9.000                              | 1.000                        | 0,045                    | $\leq 0.08D$             | 9.000                      | 880                          | 0,035                    | $\leq 0.06D$             |
| 1 30                | 7.000                                                                  | 800                          | 0,035                    | $\leq 0.1D$              | 7.000                              | 780                          | 0,030                    | $\leq 0.08D$             | 7.000                      | 640                          | 0,025                    | $\leq 0.06D$             |
| 1,5 20              | 8.000                                                                  | 1.300                        | 0,070                    | $\leq 0.1D$              | 7.000                              | 1.200                        | 0,060                    | $\leq 0.08D$             | 7.000                      | 1.100                        | 0,050                    | $\leq 0.06D$             |
| 1,5 50              | 5.000                                                                  | 800                          | 0,030                    | $\leq 0.1D$              | 5.000                              | 750                          | 0,025                    | $\leq 0.08D$             | 5.000                      | 650                          | 0,023                    | $\leq 0.06D$             |
| 2 40                | 3.500                                                                  | 600                          | 0,065                    | $\leq 0.1D$              | 3.200                              | 530                          | 0,050                    | $\leq 0.08D$             | 3.200                      | 500                          | 0,043                    | $\leq 0.06D$             |
| 2 60                | 3.000                                                                  | 450                          | 0,045                    | $\leq 0.1D$              | 2.800                              | 400                          | 0,040                    | $\leq 0.08D$             | 2.800                      | 350                          | 0,031                    | $\leq 0.06D$             |
| 3 30                | 7.000                                                                  | 1.050                        | 0,100                    | $\leq 0.1D$              | 6.000                              | 950                          | 0,080                    | $\leq 0.08D$             | 6.000                      | 850                          | 0,058                    | $\leq 0.06D$             |
| 3 50                | 3.900                                                                  | 700                          | 0,060                    | $\leq 0.1D$              | 3.400                              | 650                          | 0,050                    | $\leq 0.08D$             | 3.400                      | 550                          | 0,040                    | $\leq 0.06D$             |
| 4 35                | 7.000                                                                  | 1.100                        | 0,140                    | $\leq 0.1D$              | 6.000                              | 1.000                        | 0,100                    | $\leq 0.08D$             | 6.000                      | 800                          | 0,082                    | $\leq 0.06D$             |
| 4 50                | 3.200                                                                  | 650                          | 0,080                    | $\leq 0.1D$              | 2.900                              | 550                          | 0,065                    | $\leq 0.08D$             | 2.900                      | 450                          | 0,040                    | $\leq 0.06D$             |

• Contattare l'ufficio tecnico per maggiori dettagli sui diametri mancanti | Contact the technical department for more details on the missing diameters





**Evolution**  
FRESE • END MILLS

**Talcarb**



**INFORMAZIONI**  
Informations

■ Guida alla lettura | Reading guide:

[illegible]

|    | IT                            | EN                          |
|----|-------------------------------|-----------------------------|
| 1  | Sezione prodotto              | Product section             |
| 2  | Codice articolo               | Article code                |
| 3  | Descrizione prodotto          | Product description         |
| 4  | Simboli dati tecnici          | Symbols technical details   |
| 5  | Immagine prodotto             | Product image               |
| 6  | Disegno tecnico               | Technical design            |
| 7  | Gruppo Materiali ISO          | ISO material groups         |
| 8  | Tolleranze diametro di taglio | Cutting diameter tolerances |
| 9  | Quote dimensionali            | Dimensions quotes           |
| 10 | Codice sezione prodotto       | Product section code        |

**■ Guida per ordinare l'utensile selezionato** | Guide to ordering the selected tool:

| 1700HPF   |                               |                                                                                   |  |                               |
|-----------|-------------------------------|-----------------------------------------------------------------------------------|--|-------------------------------|
| ART. NUM. | Codice d'ordine<br>Order code |  |  | Prezzo utensile<br>Tool Price |
|           |                               |                                                                                   |  | €                             |
| 441523    | 1700HPF 3                     |                                                                                   |  | 94,30                         |
| 441524    | 1700HPF 4                     |                                                                                   |  | 94,30                         |
| 441525    | 1700HPF 5                     |                                                                                   |  | 94,30                         |
| 441526    | 1700HPF 6                     |                                                                                   |  | 94,30                         |
| 441527    | 1700HPF 8                     |                                                                                   |  | 104,00                        |
| 441528    | 1700HPF 10                    |                                                                                   |  | 111,50                        |
| 441529    | 1700HPF 12                    |                                                                                   |  | 137,00                        |
| 441530    | 1700HPF 16                    |                                                                                   |  | 246,00                        |
| 441531    | 1700HPF 20                    |                                                                                   |  | 368,00                        |

| IT                                                                                                                                                                       | EN                                                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|
| <p>Di seguito vengono illustrati i due metodi disponibili per ordinare un utensile selezionato.</p> <p>Below are the two available methods to order a selected tool.</p> |                                                      |
| <b>1</b> CODICE D'ORDINE<br>Esempio: 1700HPF 3                                                                                                                           | ORDER CODE:<br>Example: 1700HPF 3                    |
| <b>2</b> ART. NUM.<br>Codice univoco di ordinazione<br>Esempio: 441523                                                                                                   | ART. NUM.<br>Unique ordering code<br>Example: 441523 |



■ **Legenda iconografica (dati tecnici) |Iconography (technical details):**

|  | IT                                 | EN                          |
|--|------------------------------------|-----------------------------|
|  | Numero di denti                    | Flute number                |
|  | Angolo elica                       | Flute angle                 |
|  | Angolo elica passo variabile       | Angle Variable helix        |
|  | Angolo di spoglia                  | Rake angle                  |
|  | Divisione irregolare dei taglienti | Irregular division          |
|  | Gambo cilindrico Tolleranza h6     | Straight shank h6 tolerance |

|  | IT                                       | EN                                  |
|--|------------------------------------------|-------------------------------------|
|  | Idoneo al calettamento a caldo           | Shrink Fit                          |
|  | Attacco Cilindrico HA 6535               | Straight shank HA 6535              |
|  | Attacco Weldon HB 6535                   | Weldon shank HB 6535                |
|  | Riferimento pagina parametri di taglio   | Cutting parameters page reference   |
|  | Riferimento pagina informazioni generali | General informations page reference |

■ **Legenda iconografica (rivestimenti) |Iconography (coatings):**

|  | IT                                                             | EN                                                        |
|--|----------------------------------------------------------------|-----------------------------------------------------------|
|  | Rivestimento HPF [HP - TiAlSi - TiAlN - TiAlSi+ - MULTI LAYER] | Coating HPF [HP - TiAlSi - TiAlN - TiAlSi+ - MULTI LAYER] |
|  | Rivestimento HPV [HP AlCrN]                                    | Coating HPV [HP AlCrN]                                    |
|  | Rivestimento HPX [HP ZOX]                                      | Coating HPX [HP ZOX]                                      |
|  | Rivestimento HPX [HP AlTiN]                                    | Coating HPX [HP AlTiN]                                    |

|  | IT                                 | EN                            |
|--|------------------------------------|-------------------------------|
|  | Rivestimento HPD [HP Diamond]      | Coating HPD [HP Diamond]      |
|  | Rivestimento HPA [HP AlTiSiN]      | Coating HPA [HP AlTiSiN]      |
|  | Rivestimento HP [High performance] | Coating HP [High performance] |

■ **Legenda iconografica (operazioni di fresatura) |Iconography (milling operations):**

|  | IT           | EN           |
|--|--------------|--------------|
|  | CAVA         | SLOTING      |
|  | CONTORNATURA | SIDE MILLING |
|  | RAMPA        | RAMPING      |
|  | A TUFFO      | PLUNGING     |

|  | IT             | EN           |
|--|----------------|--------------|
|  | A PROFILARE 3D | 3D PROFILING |
|  | A PROFILARE    | PROFILING    |
|  | TROCIDALE      | TROCHOIDAL   |



■ Gruppo materiali ISO lavorabili | Group of working ISO materials:

|   | IT                  | EN               |
|---|---------------------|------------------|
| P | Acciai              | Steels           |
| M | Acciai inossidabili | Stainless steels |
| K | Ghisa               | Cast irons       |

|   | IT                                   | EN                 |
|---|--------------------------------------|--------------------|
| N | Metalli non ferrosi                  | Non-ferrous metals |
| S | Leghe resistenti al calore e Titanio | HRSA and Titanium  |
| H | Acciai temprati                      | Hardened steels    |

**■ Tabella conversione resistenza e durezza | Conversion table of tensile strength and hardness**

| N/mm <sup>2</sup> | Rockwell HRC | Vickers HV | Brinell HB |
|-------------------|--------------|------------|------------|
| -                 | 68           | 940        | -          |
| -                 | 67           | 900        | -          |
| -                 | 66           | 865        | -          |
| -                 | 65           | 832        | -          |
| -                 | 64           | 800        | -          |
| -                 | 63           | 772        | -          |
| -                 | 62           | 746        | -          |
| -                 | 61           | 720        | -          |
| -                 | 60           | 697        | -          |
| -                 | 59           | 674        | -          |
| -                 | 58           | 653        | -          |
| -                 | 57           | 633        | -          |
| -                 | 56           | 613        | -          |
| 2075              | 55           | 595        | -          |
| 2015              | 54           | 577        | -          |
| 1950              | 53           | 560        | -          |
| 1880              | 52           | 544        | -500       |
| 1820              | 51           | 528        | -487       |
| 1760              | 50           | 513        | -475       |
| 1695              | 49           | 498        | -464       |
| 1635              | 48           | 484        | 451        |
| 1580              | 47           | 471        | 442        |
| 1530              | 46           | 458        | 432        |
| 1480              | 45           | 446        | 421        |
| 1435              | 44           | 434        | 409        |
| 1385              | 43           | 423        | 400        |
| 1340              | 42           | 412        | 390        |
| 1295              | 41           | 402        | 381        |
| 1250              | 40           | 392        | 371        |
| 1215              | 39           | 382        | 362        |

| N/mm <sup>2</sup> | Rockwell HRC | Vickers HV | Brinell HB |
|-------------------|--------------|------------|------------|
| 1180              | 38           | 372        | 353        |
| 1160              | 37           | 363        | 344        |
| 1115              | 36           | 354        | 336        |
| 1080              | 35           | 345        | 327        |
| 1055              | 34           | 336        | 319        |
| 1025              | 33           | 327        | 311        |
| 1000              | 32           | 318        | 301        |
| 980               | 31           | 310        | 294        |
| 950               | 30           | 302        | 286        |
| 930               | 29           | 294        | 279        |
| 910               | 28           | 286        | 271        |
| 880               | 27           | 279        | 264        |
| 860               | 26           | 272        | 258        |
| 840               | 25           | 266        | 253        |
| 825               | 24           | 260        | 247        |
| 805               | 23           | 254        | 243        |
| 785               | 22           | 248        | 237        |
| 770               | 21           | 243        | 231        |
| 760               | 20           | 238        | 226        |
| 730               | 18           | 230        | 219        |
| 705               | -16          | 222        | 212        |
| 675               | -14          | 213        | 203        |
| 650               | -12          | 204        | 194        |
| 620               | -10          | 196        | 187        |
| 600               | -8           | 188        | 179        |
| 580               | -6           | 180        | 171        |
| 550               | -4           | 173        | 165        |
| 530               | -2           | 166        | 158        |
| 515               | 0            | 160        | 152        |



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# Talicarb



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