



# REPARTO 1

## UTENSILI DA TAGLIO

### Assortimento Frese

Marzo 2026  
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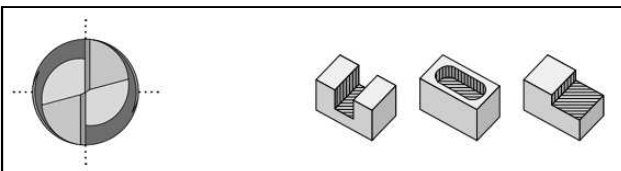
**Frese a 2/3 taglienti**  
**Microfrese**  
**Frese per finitura**  
**Frese per sgrossatura**  
**Frese emisferiche e coniche**  
**Frese ad alta velocità**  
**Frese per profili vari**  
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**Fresa a 2 taglienti extracorta, HSS-CoPM  
HSS-CoPM 2 flute extrashort end mill**
**Art. 13510** 

**Descrizione:**

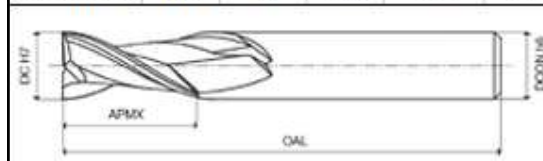
Fresa a 2 taglienti per cave in tolleranza H7, materiale HSS-Co8,5% sinterizzato con finitura lucida, UNI 8254, DIN 327B, ISO 1641/I. Profilo del tagliente N per finitura di materiali medio-legati, serie extracorta, gambo cilindrico; gambo Weldon o filettato fornibile su richiesta.

2 flute slot end mill with H7 tolerance, sintered HSS-Co8.5% with bright finish, UNI 8254, DIN 327B, ISO 1641/I. Cutting edge profile N for finishing medium-alloy materials, extra-short length, cylindrical shank; Weldon or threaded shank available upon request.

|                                                                                    |           |                                                                                    |
|------------------------------------------------------------------------------------|-----------|------------------------------------------------------------------------------------|
| PMCo<br>8,5%                                                                       | N         |  |
|  | λ's<br>32 | lucido<br>bright                                                                   |

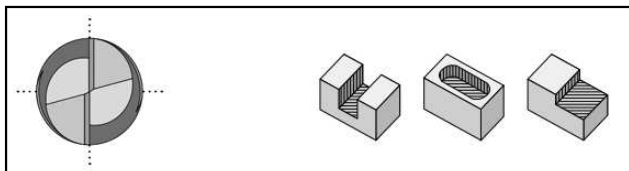
**ART. 13510**
**Dati tecnici / Technical data**

| Cod.<br>Code | DC<br>H7<br>[mm] | APMX<br>[mm] | OAL<br>[mm] | DCON<br>h6<br>[mm] | Z |
|--------------|------------------|--------------|-------------|--------------------|---|
| 13510010     | <b>1</b>         | 3            | 47          | 6                  | 2 |
| 13510015     | <b>1,5</b>       | 3            | 47          | 6                  | 2 |
| 13510020     | <b>2</b>         | 4            | 48          | 6                  | 2 |
| 13510025     | <b>2,5</b>       | 5            | 49          | 6                  | 2 |
| 13510030     | <b>3</b>         | 5            | 49          | 6                  | 2 |
| 13510035     | <b>3,5</b>       | 6            | 50          | 6                  | 2 |
| 13510040     | <b>4</b>         | 7            | 51          | 6                  | 2 |
| 13510045     | <b>4,5</b>       | 7            | 51          | 6                  | 2 |
| 13510050     | <b>5</b>         | 8            | 52          | 6                  | 2 |
| 13510055     | <b>5,5</b>       | 8            | 52          | 6                  | 2 |
| 13510060     | <b>6</b>         | 8            | 52          | 6                  | 2 |
| 13510065     | <b>6,5</b>       | 10           | 60          | 10                 | 2 |
| 13510070     | <b>7</b>         | 10           | 60          | 10                 | 2 |
| 13510075     | <b>7,5</b>       | 10           | 60          | 10                 | 2 |
| 13510080     | <b>8</b>         | 11           | 61          | 10                 | 2 |
| 13510090     | <b>9</b>         | 11           | 61          | 10                 | 2 |
| 13510100     | <b>10</b>        | 13           | 63          | 10                 | 2 |
| 13510110     | <b>11</b>        | 13           | 70          | 12                 | 2 |
| 13510120     | <b>12</b>        | 16           | 73          | 12                 | 2 |
| 13510130     | <b>13</b>        | 16           | 73          | 12                 | 2 |
| 13510140     | <b>14</b>        | 16           | 73          | 12                 | 2 |
| 13510150     | <b>15</b>        | 19           | 79          | 16                 | 2 |
| 13510160     | <b>16</b>        | 19           | 79          | 16                 | 2 |
| 13510180     | <b>18</b>        | 19           | 79          | 16                 | 2 |
| 13510200     | <b>20</b>        | 22           | 82          | 16                 | 2 |
| 13510201     | <b>20</b>        | 22           | 88          | 20                 | 2 |
| 13510220     | <b>22</b>        | 22           | 88          | 20                 | 2 |
| 13510250     | <b>25</b>        | 26           | 102         | 25                 | 2 |
| 13510260     | <b>26</b>        | 26           | 102         | 25                 | 2 |
| 13510280     | <b>28</b>        | 26           | 102         | 25                 | 2 |
| 13510300     | <b>30</b>        | 26           | 102         | 25                 | 2 |



**Fresa a 2 taglienti extracorta, HSS-CoPM, rivestita  
HSS-CoPM 2 flute extrashort end mill, coated**

**Art. 13513** 



**Descrizione:**

Fresa a 2 taglienti per cave in tolleranza H7, materiale HSS-Co8,5% sinterizzato con rivestimento multistrato a base Ti e Al per acciai, ghise, inox, titanio, HRSA; UNI 8254, DIN 327B, ISO 1641/I. Profilo del tagliente N per finitura di materiali medio-legati, serie extracorta, gambo cilindrico; gambo Weldon o filettato fornibile su richiesta.

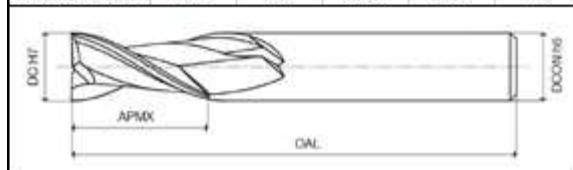
2 flute slot end mill with H7 tolerance, sintered HSS-Co8.5% with Ti and Al based multi-coating for steel, cast, iron, inox, titanium, HRSA; UNI 8254, DIN 327B, ISO 1641/I. Cutting edge profile N for finishing medium-alloy materials, extra-short length, cylindrical shank; Weldon or threaded shank available upon request.

|                                                                                     |           |                                                                                    |
|-------------------------------------------------------------------------------------|-----------|------------------------------------------------------------------------------------|
| PMCo<br>8,5%                                                                        | N         |  |
|  | λ'S<br>32 | Skin                                                                               |

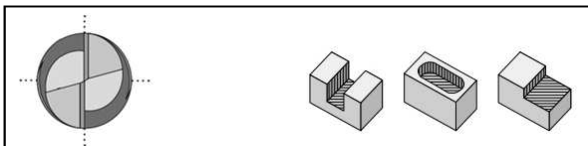
**ART. 13513**

**Dati tecnici / Technical data**

| Cod.<br>Code | DC<br>H7<br>[mm] | APMX<br>[mm] | OAL<br>[mm] | DCON<br>h6<br>[mm] | Z |
|--------------|------------------|--------------|-------------|--------------------|---|
| 13513010     | <b>1</b>         | 3            | 47          | 6                  | 2 |
| 13513015     | <b>1,5</b>       | 3            | 47          | 6                  | 2 |
| 13513020     | <b>2</b>         | 4            | 48          | 6                  | 2 |
| 13513025     | <b>2,5</b>       | 5            | 49          | 6                  | 2 |
| 13513030     | <b>3</b>         | 5            | 49          | 6                  | 2 |
| 13513040     | <b>4</b>         | 7            | 51          | 6                  | 2 |
| 13513050     | <b>5</b>         | 8            | 52          | 6                  | 2 |
| 13513060     | <b>6</b>         | 8            | 52          | 6                  | 2 |
| 13513080     | <b>8</b>         | 11           | 61          | 10                 | 2 |
| 13513100     | <b>10</b>        | 13           | 63          | 10                 | 2 |
| 13513120     | <b>12</b>        | 16           | 73          | 12                 | 2 |
| 13513140     | <b>14</b>        | 16           | 73          | 12                 | 2 |
| 13513160     | <b>16</b>        | 19           | 79          | 16                 | 2 |
| 13513180     | <b>18</b>        | 19           | 79          | 16                 | 2 |
| 13513201     | <b>20</b>        | 22           | 88          | 20                 | 2 |



*Stanco di perdere tempo  
per rivolgerti a tanti fornitori?  
Con Gnuttì Bortolo  
trovi un unico interlocutore professionale  
per 20000 articoli di consumo  
per l'industria!!*

**Fresa a 2 taglienti lunga, HSS-CoPM**  
**HSS-CoPM 2 flute long end mill**

**Descrizione:**

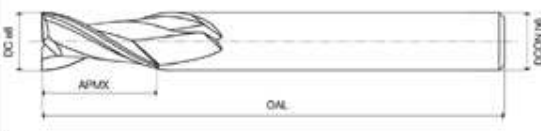
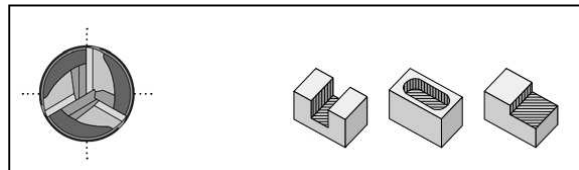
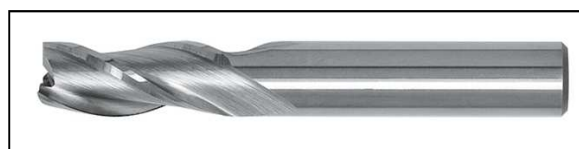
Fresa a 2 taglienti per cave in tolleranza e8, materiale HSS-Co8,5% sinterizzato con finitura lucida. Profilo del tagliente N per finitura di materiali medio-legati, serie lunga, gambo cilindrico; gambo Weldon o filettato fornibile su richiesta.

2 flute slot end mill with e8 tolerance, sintered HSS-Co8.5% with bright finish. Cutting edge profile N for finishing medium-alloy materials, long length, cylindrical shank; Weldon or threaded shank available upon request.

|                                                                                   |           |                                                                                   |
|-----------------------------------------------------------------------------------|-----------|-----------------------------------------------------------------------------------|
| PMCo<br>8,5%                                                                      | N         |  |
|  | λ'S<br>32 | lucido<br>bright                                                                  |

**Art. 13530** 

| <b>ART. 13530</b>                    |                  |              |             |                    |   |
|--------------------------------------|------------------|--------------|-------------|--------------------|---|
| <b>Dati tecnici / Technical data</b> |                  |              |             |                    |   |
| Cod.<br>Code                         | DC<br>e8<br>[mm] | APMX<br>[mm] | OAL<br>[mm] | DCON<br>h6<br>[mm] | Z |
| 13530030                             | 3                | 9            | 60          | 6                  | 2 |
| 13530040                             | 4                | 13           | 67          | 6                  | 2 |
| 13530050                             | 5                | 16           | 70          | 6                  | 2 |
| 13530060                             | 6                | 16           | 76          | 6                  | 2 |
| 13530070                             | 7                | 19           | 79          | 10                 | 2 |
| 13530080                             | 8                | 19           | 79          | 10                 | 2 |
| 13530090                             | 9                | 22           | 83          | 10                 | 2 |
| 13530100                             | 10               | 22           | 83          | 10                 | 2 |
| 13530110                             | 11               | 25           | 95          | 12                 | 2 |
| 13530120                             | 12               | 28           | 98          | 12                 | 2 |
| 13530140                             | 14               | 32           | 102         | 12                 | 2 |
| 13530150                             | 15               | 32           | 108         | 16                 | 2 |
| 13530160                             | 16               | 32           | 108         | 16                 | 2 |
| 13530180                             | 18               | 35           | 114         | 16                 | 2 |
| 13530200                             | 20               | 38           | 117         | 16                 | 2 |


**Fresa a 3 taglienti corta, HSS-CoPM**  
**HSS-CoPM 3 flute short end mill**

**Descrizione:**

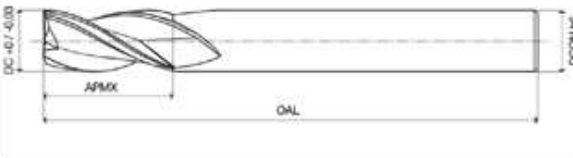
Fresa a 3 taglienti per contornatura, materiale HSS-Co8,5% sinterizzato con finitura lucida, UNI 8254, DIN 327B, ISO 1641/I. Profilo del tagliente N per finitura di materiali medio-legati, serie corta, gambo cilindrico; gambo Weldon o filettato fornibile su richiesta.

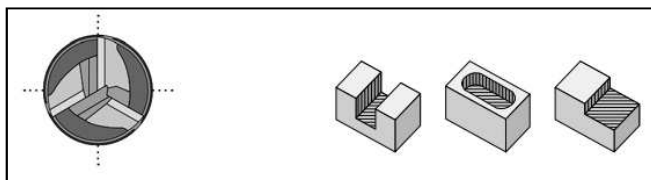
3 flute shouldering end mill, sintered HSS-Co8,5% with bright finish, UNI 8254, DIN 327B, ISO 1641/I. Cutting edge profile N for finishing medium-alloy materials, short length, cylindrical shank; Weldon or threaded shank available upon request.

|                                                                                     |           |                                                                                     |
|-------------------------------------------------------------------------------------|-----------|-------------------------------------------------------------------------------------|
| PMCo<br>8,5%                                                                        | N         |  |
|  | λ'S<br>32 | lucido<br>bright                                                                    |

**Art. 13540** 

| <b>ART. 13540</b>                    |                        |              |             |                    |   |
|--------------------------------------|------------------------|--------------|-------------|--------------------|---|
| <b>Dati tecnici / Technical data</b> |                        |              |             |                    |   |
| Cod.<br>Code                         | DC<br>+0/-0,03<br>[mm] | APMX<br>[mm] | OAL<br>[mm] | DCON<br>h6<br>[mm] | Z |
| 13540020                             | 2                      | 7            | 51          | 6                  | 3 |
| 13540025                             | 3                      | 8            | 52          | 6                  | 3 |
| 13540030                             | 3                      | 8            | 52          | 6                  | 3 |
| 13540035                             | 4                      | 10           | 54          | 6                  | 3 |
| 13540040                             | 4                      | 11           | 55          | 6                  | 3 |
| 13540045                             | 4,5                    | 11           | 55          | 6                  | 3 |
| 13540050                             | 5                      | 13           | 57          | 6                  | 3 |
| 13540060                             | 6                      | 13           | 57          | 6                  | 3 |
| 13540070                             | 7                      | 16           | 66          | 10                 | 3 |
| 13540080                             | 8                      | 19           | 69          | 10                 | 3 |
| 13540090                             | 9                      | 19           | 69          | 10                 | 3 |
| 13540100                             | 10                     | 22           | 72          | 10                 | 3 |
| 13540120                             | 12                     | 26           | 83          | 12                 | 3 |
| 13540130                             | 13                     | 26           | 83          | 12                 | 3 |
| 13540140                             | 14                     | 26           | 83          | 12                 | 3 |
| 13540160                             | 16                     | 32           | 92          | 16                 | 3 |
| 13540180                             | 18                     | 32           | 92          | 16                 | 3 |
| 13540200                             | 20                     | 38           | 98          | 16                 | 3 |

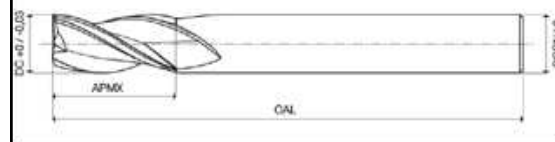


**Fresa a 3 taglienti corta, HSS-CoPM, rivestita**  
**HSS-CoPM 3 flute short end mill, coated**

**Descrizione:**

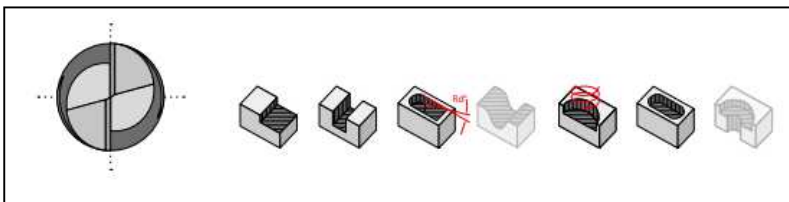
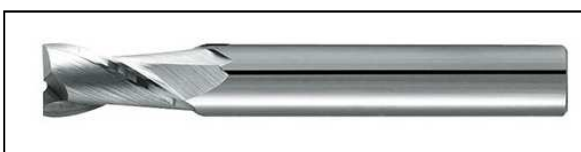
Fresa a 3 taglienti per contornatura, materiale HSS-Co8,5% sinterizzato con rivestimento multistrato a base Ti e Al per acciai, ghise, inox, titanio, HRSA; UNI 8254, DIN 327B, ISO 1641/I. Profilo del tagliente N per finitura di materiali medio-legati, serie corta, gambo cilindrico; gambo Weldon o filettato fornibile su richiesta.

3 flute shouldering end mill, sintered HSS-Co8,5% with Ti and Al based multi-coating for steel, cast, iron, inox, titanium, HRSA; UNI 8254, DIN 327B, ISO 1641/I. Cutting edge profile N for finishing medium-alloy materials, short length, cylindrical shank; Weldon or threaded shank available upon request.

| <b>ART. 13544</b>                    |                  |           |          |              |   |
|--------------------------------------|------------------|-----------|----------|--------------|---|
| <b>Dati tecnici / Technical data</b> |                  |           |          |              |   |
| Cod. Code                            | DC +0/-0,03 [mm] | APMX [mm] | OAL [mm] | DCON h6 [mm] | Z |
| 13544050                             | 5                | 13        | 57       | 6            | 3 |
| 13544060                             | 6                | 13        | 57       | 6            | 3 |
| 13544080                             | 8                | 19        | 69       | 10           | 3 |
| 13544100                             | 10               | 22        | 72       | 10           | 3 |



|                                                                                     |           |                                                                                     |
|-------------------------------------------------------------------------------------|-----------|-------------------------------------------------------------------------------------|
| PMCo<br>8,5%                                                                        | N         |  |
|  | λ'S<br>32 | Skin                                                                                |

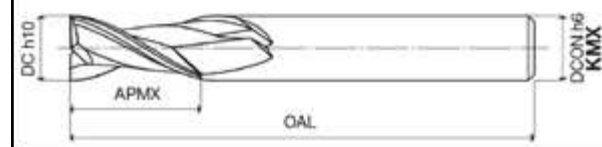
**Fresa a 2 taglienti corta, HM**  
**HM 2 flute short end mill**

**Descrizione:**

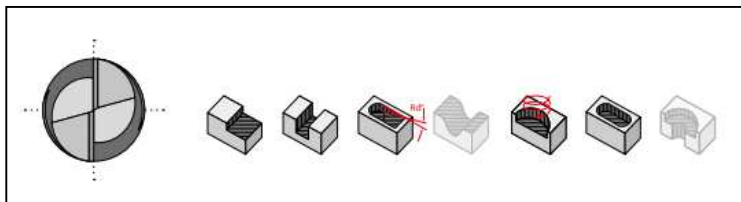
Fresa a 2 taglienti per cave, materiale metallo duro HM con finitura lucida, UNI DIN ISO 6528. Profilo del tagliente H per lavorazioni di materiali alto-legati, serie corta, gambo cilindrico; gambo Weldon fornibile su richiesta.

2 flute slot end mill, solid carbide HM with bright finish, UNI DIN ISO 6528. Cutting edge profile H for the machining of high-alloyed materials, short length, cylindrical shank; Weldon shank available upon request.

|                                                                                     |           |                                                                                     |
|-------------------------------------------------------------------------------------|-----------|-------------------------------------------------------------------------------------|
| HM                                                                                  | H         |  |
|  | λ'S<br>32 | lucido<br>bright                                                                    |

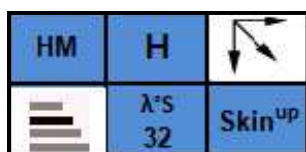
| <b>ART. 13590</b>                    |             |           |          |              |   |
|--------------------------------------|-------------|-----------|----------|--------------|---|
| <b>Dati tecnici / Technical data</b> |             |           |          |              |   |
| Cod. Code                            | DC h10 [mm] | APMX [mm] | OAL [mm] | DCON h6 [mm] | Z |
| 13590020                             | 2           | 7         | 40       | 2            | 2 |
| 13590025                             | 2,5         | 8         | 40       | 2,5          | 2 |
| 13590030                             | 3           | 8         | 40       | 3            | 2 |
| 13590035                             | 3,5         | 10        | 50       | 3,5          | 2 |
| 13590040                             | 4           | 10        | 50       | 4            | 2 |
| 13590045                             | 4,5         | 12        | 50       | 4,5          | 2 |
| 13590050                             | 5           | 12        | 50       | 5            | 2 |
| 13590060                             | 6           | 14        | 57       | 6            | 2 |
| 13590070                             | 7           | 14        | 60       | 7            | 2 |
| 13590080                             | 8           | 16        | 63       | 8            | 2 |
| 13590090                             | 9           | 18        | 67       | 9            | 2 |
| 13590100                             | 10          | 20        | 72       | 10           | 2 |
| 13590110                             | 11          | 20        | 83       | 11           | 2 |
| 13590120                             | 12          | 22        | 83       | 12           | 2 |
| 13590140                             | 14          | 25        | 83       | 14           | 2 |
| 13590160                             | 16          | 32        | 92       | 16           | 2 |
| 13590180                             | 18          | 32        | 92       | 18           | 2 |
| 13590200                             | 20          | 38        | 104      | 20           | 2 |



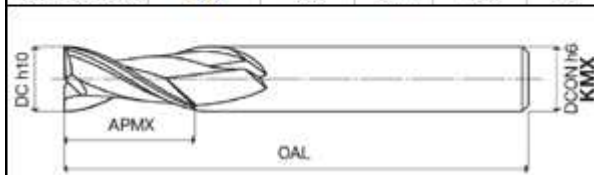
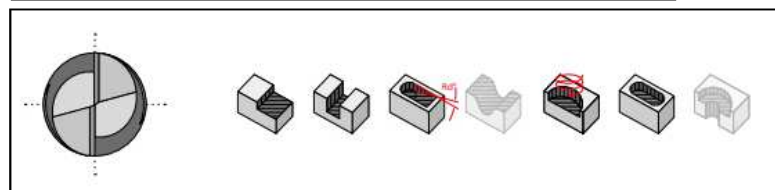
**Fresa a 2 taglienti corta, HM, rivestita**  
**HM 2 flute short end mill, coated**
**Art. 13594** 

**Descrizione:**

Fresa a 2 taglienti per cave, materiale metallo duro HM con rivestimento multistrato a base Ti e Al per tutti i tipi di materiali; UNI DIN ISO 6528. Profilo del tagliente H per lavorazioni di materiali alto-legati, serie corta, gambo cilindrico; gambo Weldon fornibile su richiesta.

2 flute slot end mill, solid carbide HM with Ti and Al based multi-coating for every kind of materials, UNI DIN ISO 6528. Cutting edge profile H for the machining of high-alloyed materials, short length, cylindrical shank; Weldon shank available upon request.

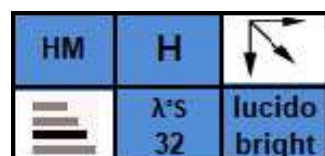

**ART. 13594**
**Dati tecnici / Technical data**

| Cod. Code | DC h10 [mm] | APMX [mm] | OAL [mm] | DCON h6 [mm] | Z |
|-----------|-------------|-----------|----------|--------------|---|
| 13594020  | 2           | 7         | 40       | 2            | 2 |
| 13594030  | 3           | 8         | 40       | 3            | 2 |
| 13594035  | 3,5         | 10        | 50       | 3,5          | 2 |
| 13594040  | 4           | 10        | 50       | 4            | 2 |
| 13594045  | 4,5         | 12        | 50       | 4,5          | 2 |
| 13594050  | 5           | 12        | 50       | 5            | 2 |
| 13594060  | 6           | 14        | 57       | 6            | 2 |
| 13594070  | 7           | 14        | 60       | 7            | 2 |
| 13594080  | 8           | 16        | 63       | 8            | 2 |
| 13594090  | 9           | 18        | 67       | 9            | 2 |
| 13594100  | 10          | 20        | 72       | 10           | 2 |
| 13594110  | 11          | 20        | 83       | 11           | 2 |
| 13594120  | 12          | 22        | 83       | 12           | 2 |

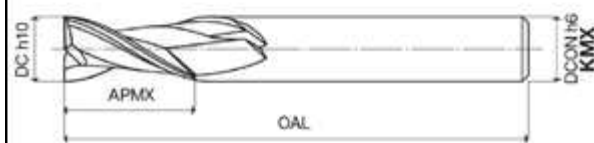

**Fresa a 2 taglienti lunga, HM**  
**HM 2 flute long end mill**
**Art. 13600** 

**Descrizione:**

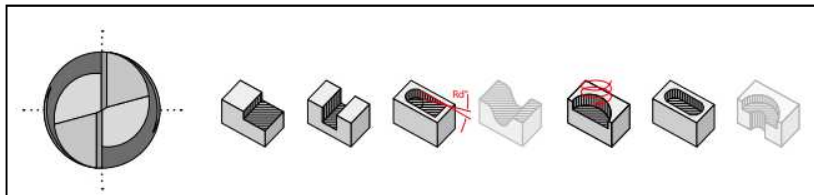
Fresa a 2 taglienti per cave, materiale metallo duro HM con finitura lucida. Profilo del tagliente H per lavorazioni di materiali alto-legati, serie lunga, gambo cilindrico; gambo Weldon fornibile su richiesta.

2 flute slot end mill, solid carbide HM with bright finish. Cutting edge profile H for the machining of high-alloyed materials, long length, cylindrical shank; Weldon shank available upon request.


**ART. 13600**
**Dati tecnici / technical data**

| Cod. Code | DC h10 [mm] | APMX [mm] | OAL [mm] | DCON h6 [mm] | Z |
|-----------|-------------|-----------|----------|--------------|---|
| 13600030  | 3           | 20        | 55       | 3            | 2 |
| 13600040  | 4           | 20        | 60       | 4            | 2 |
| 13600050  | 5           | 20        | 60       | 5            | 2 |
| 13600060  | 6           | 24        | 65       | 6            | 2 |
| 13600080  | 8           | 32        | 80       | 8            | 2 |
| 13600100  | 10          | 32        | 80       | 10           | 2 |
| 13600120  | 12          | 50        | 100      | 12           | 2 |
| 13600140  | 14          | 55        | 115      | 14           | 2 |
| 13600180  | 18          | 60        | 120      | 18           | 2 |



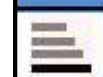
**Fresa a 2 taglienti extralunga, HM  
HM 2 flute extralong end mill**
**Art. 13610** 

**Descrizione:**

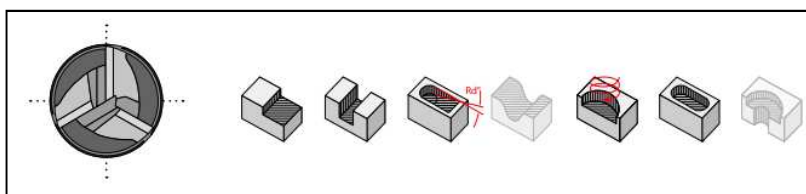
Fresa a 2 taglienti per cave, materiale metallo duro HM con finitura lucida. Profilo del tagliente H per lavorazioni di materiali alto-legati, serie extralunga, gambo cilindrico; gambo Weldon fornibile su richiesta.

2 flute slot end mill, solid carbide HM with bright finish. Cutting edge profile H for the machining of high-alloyed materials, extra long length, cylindrical shank; Weldon shank available upon request.

| ART. 13610                    |             |           |          |              |   |
|-------------------------------|-------------|-----------|----------|--------------|---|
| Dati tecnici / Technical data |             |           |          |              |   |
| Cod. Code                     | DC h10 [mm] | APMX [mm] | OAL [mm] | DCON h6 [mm] | Z |
| 13610040                      | 4           | 32        | 72       | 4            | 2 |
| 13610060                      | 6           | 40        | 82       | 6            | 2 |
| 13610080                      | 8           | 42        | 100      | 8            | 2 |
| 13610100                      | 10          | 45        | 100      | 10           | 2 |



|                                                                                     |        |                                                                                     |
|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|
| HM                                                                                  | H      |  |
|  | λ'S 32 | lucido bright                                                                       |

**Fresa a 3 taglienti lunga, HM  
HM 3 flute long end mill**
**Art. 13620** 

**Descrizione:**

Fresa a 3 taglienti per contornatura, materiale metallo duro HM con finitura lucida. Profilo del tagliente H per lavorazioni di materiali alto-legati, serie lunga, gambo cilindrico; gambo Weldon fornibile su richiesta.

3 flute shouldering end mill, solid carbide HM with bright finish. Cutting edge profile H for the machining of high-alloyed materials, long length, cylindrical shank; Weldon shank available upon request.

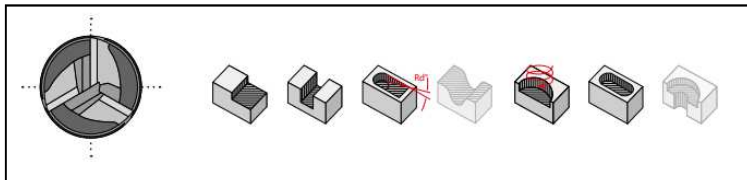
| ART. 13620                    |             |           |          |              |   |
|-------------------------------|-------------|-----------|----------|--------------|---|
| Dati tecnici / Technical data |             |           |          |              |   |
| Cod. Code                     | DC h10 [mm] | APMX [mm] | OAL [mm] | DCON h6 [mm] | Z |
| 13620030                      | 3           | 20        | 55       | 3            | 3 |
| 13620040                      | 4           | 20        | 60       | 4            | 3 |
| 13620050                      | 5           | 20        | 60       | 5            | 3 |
| 13620060                      | 6           | 24        | 65       | 6            | 3 |
| 13620080                      | 8           | 32        | 80       | 8            | 3 |
| 13620100                      | 10          | 32        | 80       | 10           | 3 |
| 13620120                      | 12          | 50        | 100      | 12           | 3 |



|                                                                                       |        |                                                                                       |
|---------------------------------------------------------------------------------------|--------|---------------------------------------------------------------------------------------|
| HM                                                                                    | H      |  |
|  | λ'S 30 | lucido bright                                                                         |



*Hai dei parametri di lavoro ma non trovi l'utensile?  
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**Fresa a 3 taglienti lunga, HM, rivestita**  
**HM 2 flute long end mill, coated**
**Art. 13623** 

**Descrizione:**

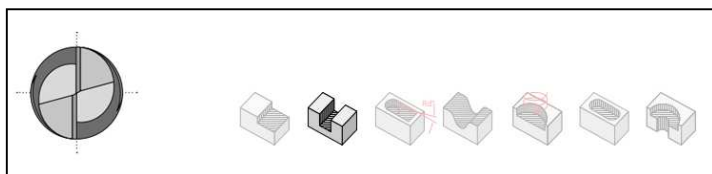
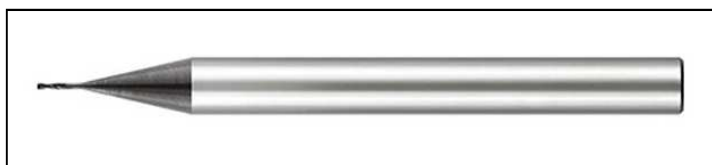
Fresa a 3 taglienti per contornatura, materiale metallo duro HM con rivestimento multistrato a base Ti e Al per tutti i tipi di materiali. Profilo del tagliente H per lavorazioni di materiali alto-legati, serie lunga, gambo cilindrico; gambo Weldon fornibile su richiesta.

3 flute shouldering end mill, solid carbide HM with Ti and Al based multi-coating for every kind of materials. Cutting edge profile H for the machining of high-alloyed materials, long length, cylindrical shank; Weldon shank available upon request.

| ART. 13623                    |             |           |          |              |   |
|-------------------------------|-------------|-----------|----------|--------------|---|
| Dati tecnici / Technical data |             |           |          |              |   |
| Cod. Code                     | DC h10 [mm] | APMX [mm] | OAL [mm] | DCON h6 [mm] | Z |
| 13623030                      | 3           | 20        | 55       | 3            | 3 |
| 13623040                      | 4           | 20        | 60       | 4            | 3 |
| 13623050                      | 5           | 20        | 60       | 5            | 3 |
| 13623060                      | 6           | 24        | 65       | 6            | 3 |
| 13623080                      | 8           | 32        | 80       | 8            | 3 |
| 13623100                      | 10          | 32        | 80       | 10           | 3 |
| 13623120                      | 12          | 50        | 100      | 12           | 3 |



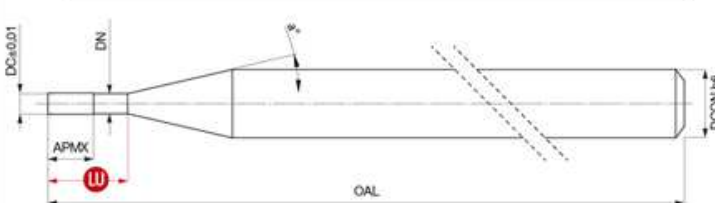
|                                                                                     |        |                                                                                     |
|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|
| HM                                                                                  | H      |  |
|  | λ'S 30 | Skin <sup>up</sup>                                                                  |

**Microfresa piana extracorta, HM HSC, rivestita**  
**HM HSC flat extrashort micro end mill, coated**
**Frese - Microfrese**
**Art. 13632** 

**Descrizione:**

Microfresa piana a 2 taglienti per cave, materiale metallo duro HM HSC per alta velocità di taglio, con rivestimento multistrato a base Ti e Al per fresatura di materiali duri e tenaci. Profilo del tagliente H per lavorazioni di materiali alto-legati, serie extracorta, gambo cilindrico.

2 flute flat slot micro end mill, solid carbide HM HSC (High Speed Cutting) with Ti and Al based multi-coating for milling of hard and tough materials. Cutting edge profile H for the machining of high-alloyed materials, extrashort length, cylindrical shank.

| ART. 13632                    |               |         |           |         |          |              |   |
|-------------------------------|---------------|---------|-----------|---------|----------|--------------|---|
| Dati tecnici / Technical data |               |         |           |         |          |              |   |
| Cod. Code                     | DC ±0,01 [mm] | DN [mm] | APMX [mm] | LU [mm] | OAL [mm] | DCON h6 [mm] | Z |
| 13632050                      | 0,5           | 0,48    | 1         | 2       | 40       | 3            | 2 |
| 13632060                      | 0,6           | 0,58    | 1,2       | 2,5     | 40       | 3            | 2 |
| 13632080                      | 0,8           | 0,78    | 1,6       | 3       | 40       | 3            | 2 |
| 13632100                      | 1             | 0,98    | 2,5       | 4       | 40       | 4            | 2 |
| 13632120                      | 1,2           | 1,18    | 4         | 5,5     | 40       | 4            | 2 |
| 13632150                      | 1,5           | 1,48    | 4         | 5,5     | 40       | 4            | 2 |

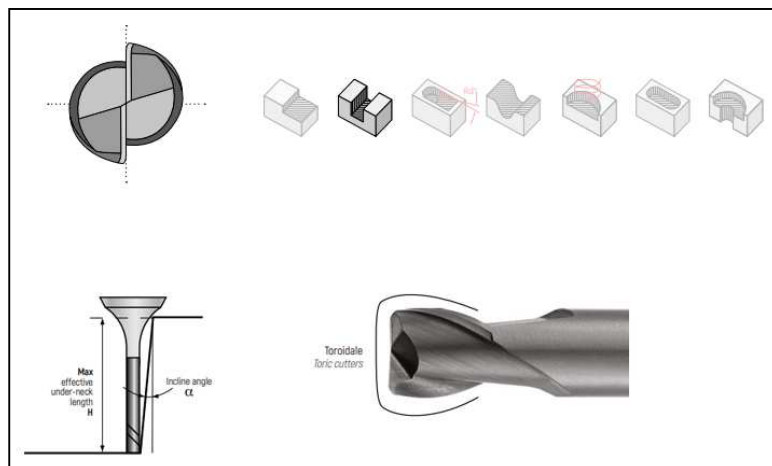


|                                                                                       |        |                                                                                       |
|---------------------------------------------------------------------------------------|--------|---------------------------------------------------------------------------------------|
| HM HSC                                                                                | H      |  |
|  | λ'S 30 | Skin <sup>3</sup>                                                                     |

**Microfresa torica, HM HSC, rivestita  
HM HSC torus micro end mill, coated**
**Art. 13636** 

**Descrizione:**

Microfresa torica a 2 taglienti per nervature profonde, materiale metallo duro HM HSC per alta velocità di taglio, con rivestimento multistrato a base Ti e Al per fresatura di materiali duri e tenaci. Serie Micro per stampisti con profilo del tagliente HSC per la lavorazione di acciai temprati fino a 65 HRC, gambo cilindrico. Ulteriori dimensioni, lunghezze e raggi sono disponibili su richiesta.

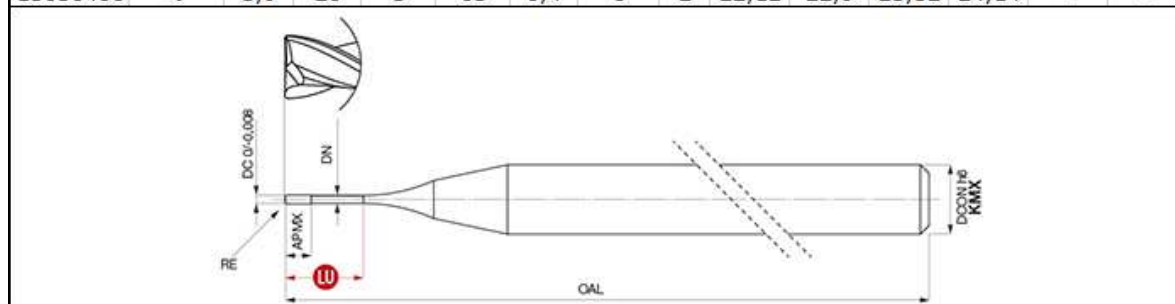


2 flute torus micro end mill for deep ribs, solid carbide HM HSC (High Speed Cutting) with Ti and Al based multi-coating for milling of hard and tough materials. Micro series for mold makers with HSC cutting edge profile for machining hardened steels up to 65 HRC, cylindrical shank. Other dimensions, lengths and radii are available upon request.

|           |           |                                                                                     |
|-----------|-----------|-------------------------------------------------------------------------------------|
| HM<br>HSC | HSC       |  |
|           | λ'S<br>30 | Skin <sup>3</sup>                                                                   |

**ART. 13636**
**Dati tecnici / Technical data**

| Cod.<br>Code | DC<br>0/-0,008<br>[mm] | DN<br>[mm] | LU<br>[mm] | APMX<br>[mm] | OAL<br>[mm] | RE<br>[mm] | DCON<br>h6<br>[mm] | Z | H<br>α=0,5°<br>[mm] | H<br>α=1°<br>[mm] | H<br>α=1,5°<br>[mm] | H<br>α=2°<br>[mm] | H<br>α=2,5°<br>[mm] | H<br>α=3°<br>[mm] |
|--------------|------------------------|------------|------------|--------------|-------------|------------|--------------------|---|---------------------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 13636054     | 0,5                    | 0,48       | 4          | 1            | 50          | 0,1        | 4                  | 2 | 4,99                | 5,4               | 5,74                | 6,05              | 6,34                | 6,6               |
| 13636056     | 0,5                    | 0,48       | 6          | 1            | 50          | 0,1        | 4                  | 2 | 7,16                | 7,64              | 8,05                | 8,4               | 8,73                | 9,03              |
| 13636064     | 0,6                    | 0,58       | 4          | 1            | 50          | 0,1        | 4                  | 2 | 4,99                | 5,4               | 5,74                | 6,05              | 6,34                | 6,6               |
| 13636066     | 0,6                    | 0,58       | 6          | 1            | 50          | 0,1        | 4                  | 2 | 7,16                | 7,64              | 8,05                | 8,4               | 8,73                | 9,03              |
| 13636084     | 0,8                    | 0,77       | 4          | 1            | 50          | 0,1        | 4                  | 2 | 5,04                | 5,43              | 5,77                | 6,08              | 6,36                | 6,63              |
| 13636086     | 0,8                    | 0,77       | 6          | 1            | 50          | 0,1        | 4                  | 2 | 7,2                 | 7,66              | 8,07                | 8,42              | 8,75                | 9,05              |
| 13636100     | 1                      | 0,95       | 5          | 1            | 58          | 0,1        | 6                  | 2 | 6,21                | 6,63              | 6,95                | 7,31              | 7,61                | 7,89              |
| 13636104     | 1                      | 0,95       | 10         | 1            | 58          | 0,1        | 6                  | 2 | 11,53               | 12,12             | 12,6                | 13,02             | 13,4                | 13,75             |
| 13636150     | 1,5                    | 1,44       | 8          | 1,5          | 58          | 0,15       | 6                  | 2 | 9,45                | 9,96              | 10,4                | 10,78             | 11,13               | 11,45             |
| 13636154     | 1,5                    | 1,44       | 12         | 1,5          | 58          | 0,15       | 6                  | 2 | 13,67               | 14,3              | 14,82               | 15,26             | 15,67               | 16,06             |
| 13636200     | 2                      | 1,92       | 10         | 2            | 58          | 0,2        | 6                  | 2 | 11,63               | 12,19             | 12,66               | 13,07             | 13,44               | 13,79             |
| 13636202     | 2                      | 1,92       | 12         | 2            | 58          | 0,2        | 6                  | 2 | 13,73               | 14,35             | 14,85               | 15,29             | 15,69               | 16,13             |
| 13636204     | 2                      | 1,92       | 16         | 2            | 65          | 0,2        | 6                  | 2 | 17,92               | 18,63             | 19,2                | 19,7              | 20,32               | 21,44             |
| 13636206     | 2                      | 1,92       | 20         | 2            | 65          | 0,2        | 6                  | 2 | 22,1                | 22,89             | 23,52               | 24,11             | 25,36               | 26,75             |
| 13636250     | 2,5                    | 2,4        | 13         | 2            | 58          | 0,25       | 6                  | 2 | 14,84               | 15,46             | 15,98               | 16,43             | 16,84               | 17,51             |
| 13636300     | 3                      | 2,85       | 8          | 3            | 58          | 0,3        | 6                  | 2 | 9,71                | 10,17             | 10,57               | 10,93             | 11,26               | 11,57             |
| 13636302     | 3                      | 2,85       | 12         | 3            | 58          | 0,3        | 6                  | 2 | 13,91               | 14,47             | 14,96               | 15,38             | 15,77               | 16,33             |
| 13636304     | 3                      | 2,85       | 16         | 3            | 65          | 0,3        | 6                  | 2 | 18,08               | 18,74             | 19,29               | 19,77             | 20,51               | 21,63             |
| 13636306     | 3                      | 2,85       | 20         | 4            | 65          | 0,3        | 6                  | 2 | 22,24               | 22,98             | 23,59               | 24,28             | 25,54               | 26,94             |
| 13636400     | 4                      | 3,9        | 12         | 4,5          | 58          | 0,4        | 6                  | 2 | 13,77               | 14,37             | 14,87               | 15,31             | 15,7                | 16,17             |
| 13636404     | 4                      | 3,9        | 16         | 4,5          | 58          | 0,4        | 6                  | 2 | 17,96               | 18,65             | 19,22               | 19,71             | 20,36               | 20,87             |
| 13636406     | 4                      | 3,9        | 20         | 5            | 65          | 0,4        | 6                  | 2 | 22,12               | 22,9              | 23,52               | 24,14             | -                   | -                 |

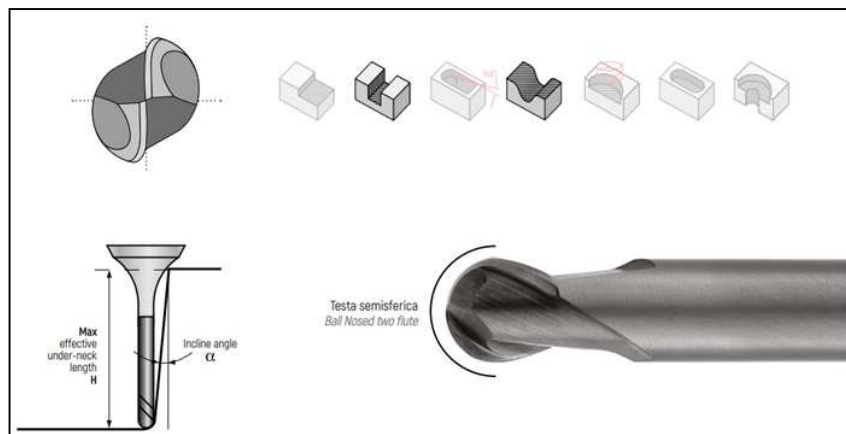


**Microfresa emisferica, HM HSC, rivestita  
HM HSC ball-nosed micro end mill, coated**
**Art. 13638** 
**Descrizione:**

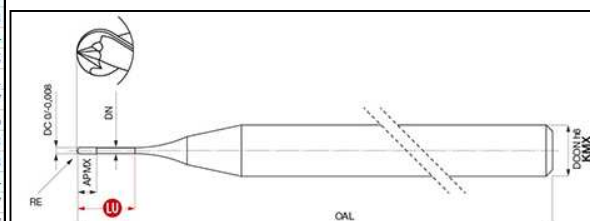
Microfresa emisferica a 2 taglienti per semifinitura e finitura, materiale metallo duro HM HSC per alta velocità di taglio, con rivestimento multistrato a base Ti e Al per fresatura di materiali duri e tenaci. Serie Micro per stampisti con profilo del tagliente HSC per la lavorazione di acciai temprati fino a 65 HRC, gambo cilindrico. Ulteriori dimensioni, lunghezze e raggi sono disponibili su richiesta.

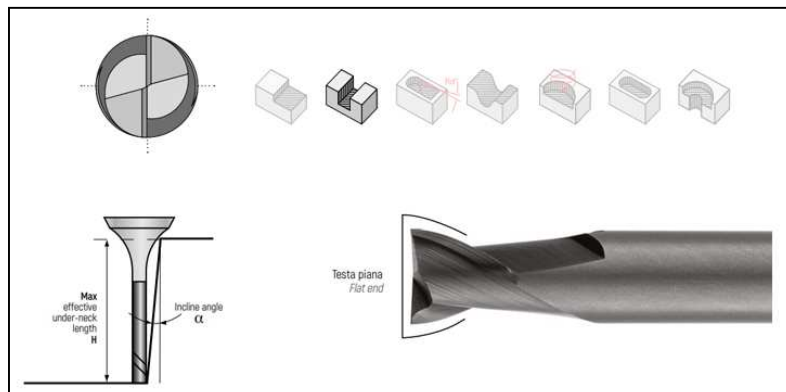
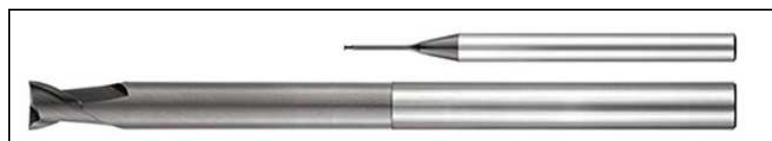
2 flute ball-nosed micro end mill for semi-finishing and finishing, solid carbide HM HSC (High Speed Cutting) with Ti and Al based multi-coating for milling of hard and tough materials. Micro series for mold makers with HSC cutting edge profile for machining hardened steels up to 65 HRC, cylindrical shank. Other dimensions and radii are available upon request.

|           |           |                                                                                     |
|-----------|-----------|-------------------------------------------------------------------------------------|
| HM<br>HSC | HSC       |  |
| -         | λ'S<br>30 | Skin <sup>3</sup>                                                                   |


**ART. 13638**
**Dati tecnici / Technical data**

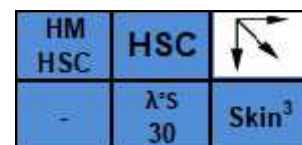
| Cod. Code | DC<br>0/-0,008<br>[mm] | DN<br>[mm] | LU<br>[mm] | APMX<br>[mm] | OAL<br>[mm] | RE<br>[mm] | DCON<br>h6<br>[mm] | Z | H<br>α=0,5°<br>[mm] | H<br>α=1°<br>[mm] | H<br>α=1,5°<br>[mm] | H<br>α=2°<br>[mm] | H<br>α=2,5°<br>[mm] | H<br>α=3°<br>[mm] |
|-----------|------------------------|------------|------------|--------------|-------------|------------|--------------------|---|---------------------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 13638054  | 0,5                    | 0,48       | 4          | 1            | 50          | 0,25       | 4                  | 2 | 4,99                | 5,40              | 5,74                | 6,05              | 6,34                | 6,6               |
| 13638056  | 0,5                    | 0,48       | 6          | 1            | 50          | 0,25       | 4                  | 2 | 7,16                | 7,64              | 8,05                | 8,4               | 8,73                | 9,03              |
| 13638064  | 0,6                    | 0,58       | 4          | 1            | 50          | 0,3        | 4                  | 2 | 4,99                | 5,40              | 5,74                | 6,05              | 6,34                | 6,6               |
| 13638066  | 0,6                    | 0,58       | 6          | 1            | 50          | 0,3        | 4                  | 2 | 7,16                | 7,64              | 8,05                | 8,4               | 8,73                | 9,03              |
| 13638084  | 0,8                    | 0,77       | 4          | 1            | 50          | 0,4        | 4                  | 2 | 5,04                | 5,43              | 5,77                | 6,08              | 6,36                | 6,63              |
| 13638086  | 0,8                    | 0,77       | 6          | 1            | 50          | 0,4        | 4                  | 2 | 7,2                 | 7,66              | 8,07                | 8,42              | 8,75                | 9,05              |
| 13638087  | 0,8                    | 0,77       | 2          | 0,5          | 50          | 0,4        | 4                  | 2 | 2,83                | 3,14              | 3,39                | 3,64              | 3,86                | 4,09              |
| 13638088  | 0,8                    | 0,77       | 6          | 0,5          | 50          | 0,4        | 4                  | 2 | 7,2                 | 7,66              | 8,06                | 8,42              | 8,75                | 9,05              |
| 13638089  | 0,8                    | 0,77       | 10         | 0,5          | 50          | 0,4        | 4                  | 2 | 11,47               | 12,03             | 12,55               | 12,98             | 13,36               | 13,69             |
| 13638100  | 1                      | 0,95       | 5          | 1            | 60          | 0,5        | 6                  | 2 | 6,21                | 6,63              | 6,95                | 7,31              | 7,61                | 7,89              |
| 13638104  | 1                      | 0,95       | 10         | 1            | 58          | 0,5        | 6                  | 2 | 11,53               | 12,12             | 12,6                | 13,02             | 13,4                | 13,75             |
| 13638105  | 1                      | 0,95       | 3          | 0,8          | 50          | 0,5        | 4                  | 2 | 4,05                | 4,35              | 4,67                | 4,94              | 5,19                | 5,43              |
| 13638106  | 1                      | 0,95       | 4          | 0,8          | 50          | 0,5        | 4                  | 2 | 5,13                | 5,51              | 5,83                | 6,13              | 6,41                | 6,67              |
| 13638108  | 1                      | 0,95       | 6          | 0,8          | 50          | 0,5        | 4                  | 2 | 7,27                | 7,74              | 8,12                | 8,47              | 8,79                | 9,08              |
| 13638110  | 1                      | 0,95       | 8          | 0,8          | 50          | 0,5        | 4                  | 2 | 9,41                | 9,93              | 10,37               | 10,76             | 11,11               | 11,44             |
| 13638112  | 1                      | 0,95       | 10         | 0,8          | 50          | 0,5        | 4                  | 2 | 11,53               | 12,11             | 12,6                | 13,02             | 13,4                | 13,75             |
| 13638114  | 1                      | 0,95       | 12         | 0,8          | 55          | 0,5        | 4                  | 2 | 13,63               | 14,28             | 14,8                | 15,25             | 15,65               | 16,03             |
| 13638116  | 1                      | 0,95       | 16         | 0,8          | 55          | 0,5        | 4                  | 2 | 17,85               | 18,58             | 19,16               | 19,66             | 20,23               | 21,34             |
| 13638118  | 1                      | 0,95       | 20         | 0,8          | 60          | 0,5        | 4                  | 2 | 22,03               | 22,83             | 23,47               | 24,02             | 25,27               | 26,65             |
| 13638120  | 1,2                    | 1,15       | 8          | 1,1          | 50          | 0,6        | 4                  | 2 | 9,41                | 9,93              | 10,37               | 10,76             | 11,11               | 11,43             |
| 13638121  | 1,2                    | 1,15       | 12         | 1,1          | 55          | 0,6        | 4                  | 2 | 13,64               | 14,28             | 14,8                | 15,25             | 15,65               | 16,03             |
| 13638140  | 1,4                    | 1,34       | 8          | 1,3          | 50          | 0,7        | 4                  | 2 | 9,45                | 9,96              | 10,4                | 10,78             | 11,13               | 11,45             |
| 13638141  | 1,4                    | 1,34       | 16         | 1,3          | 55          | 0,7        | 4                  | 2 | 17,87               | 18,59             | 19,17               | 19,67             | 20,26               | 21,37             |
| 13638150  | 1,5                    | 1,44       | 8          | 1,5          | 60          | 0,75       | 6                  | 2 | 9,45                | 9,96              | 10,4                | 10,78             | 11,13               | 11,45             |
| 13638154  | 1,5                    | 1,44       | 12         | 1,5          | 58          | 0,75       | 6                  | 2 | 13,67               | 14,3              | 14,82               | 15,26             | 15,67               | 16,06             |
| 13638155  | 1,5                    | 1,44       | 8          | 1,35         | 50          | 0,75       | 4                  | 2 | 9,45                | 9,96              | 10,4                | 10,78             | 11,13               | 11,45             |
| 13638156  | 1,5                    | 1,44       | 12         | 1,35         | 55          | 0,75       | 4                  | 2 | 13,67               | 14,3              | 14,82               | 15,26             | 15,67               | 16,06             |
| 13638158  | 1,5                    | 1,44       | 20         | 1,35         | 60          | 0,75       | 4                  | 2 | 22,05               | 22,85             | 23,49               | 24,05             | 25,3                | -                 |
| 13638160  | 1,6                    | 1,54       | 12         | 1,4          | 55          | 0,8        | 4                  | 2 | 13,67               | 14,3              | 14,82               | 15,26             | 15,67               | 16,06             |
| 13638161  | 1,6                    | 1,54       | 20         | 1,4          | 60          | 0,8        | 4                  | 2 | 22,05               | 22,85             | 23,49               | 24,05             | 25,3                | -                 |
| 13638180  | 1,8                    | 1,73       | 12         | 1,6          | 55          | 0,9        | 4                  | 2 | 13,7                | 14,32             | 14,83               | 15,28             | 15,68               | 16,1              |
| 13638181  | 1,8                    | 1,73       | 20         | 1,6          | 60          | 0,9        | 4                  | 2 | 22,07               | 22,87             | 23,5                | 24,08             | -                   | -                 |
| 13638192  | 2                      | 1,92       | 6          | 1,7          | 50          | 1          | 4                  | 2 | 7,4                 | 7,83              | 8,2                 | 8,54              | 8,85                | 9,14              |
| 13638193  | 2                      | 1,92       | 8          | 1,7          | 50          | 1          | 4                  | 2 | 9,52                | 10,02             | 10,44               | 10,82             | 11,16               | 11,48             |
| 13638194  | 2                      | 1,92       | 10         | 1,7          | 50          | 1          | 4                  | 2 | 11,63               | 12,19             | 12,66               | 13,07             | 13,44               | 13,79             |
| 13638195  | 2                      | 1,92       | 12         | 1,7          | 55          | 1          | 4                  | 2 | 13,73               | 14,35             | 14,85               | 15,29             | 15,69               | 16,13             |
| 13638196  | 2                      | 1,92       | 16         | 1,7          | 55          | 1          | 4                  | 2 | 17,92               | 18,63             | 19,2                | 19,7              | 20,32               | -                 |
| 13638197  | 2                      | 1,92       | 20         | 1,7          | 60          | 1          | 4                  | 2 | 22,1                | 22,89             | 23,52               | 24,11             | -                   | -                 |
| 13638198  | 2                      | 1,92       | 25         | 1,7          | 65          | 1          | 4                  | 2 | 27,29               | 28,17             | 28,86               | -                 | -                   | -                 |
| 13638199  | 2                      | 1,92       | 30         | 1,7          | 70          | 1          | 4                  | 2 | 32,47               | 33,43             | 34,38               | -                 | -                   | -                 |
| 13638200  | 2                      | 1,92       | 10         | 2            | 58          | 1          | 6                  | 2 | 11,63               | 12,19             | 12,66               | 13,07             | 13,44               | 13,79             |
| 13638202  | 2                      | 1,92       | 12         | 2            | 58          | 1          | 6                  | 2 | 13,73               | 14,35             | 14,85               | 15,29             | 15,69               | 16,13             |
| 13638204  | 2                      | 1,92       | 16         | 2            | 65          | 1          | 6                  | 2 | 17,92               | 18,63             | 19,2                | 19,7              | 20,32               | 21,44             |
| 13638206  | 2                      | 1,92       | 20         | 2            | 65          | 1          | 6                  | 2 | 22,1                | 22,89             | 23,52               | 24,11             | 25,36               | 26,75             |
| 13638250  | 2,5                    | 2,4        | 13         | 2,5          | 60          | 1,25       | 6                  | 2 | 14,84               | 15,46             | 15,98               | 16,43             | 16,84               | 17,51             |
| 13638300  | 3                      | 2,85       | 8          | 3            | 58          | 1,5        | 6                  | 2 | 9,71                | 10,17             | 10,57               | 10,93             | 11,26               | 11,57             |
| 13638301  | 3                      | 2,85       | 10         | 2,5          | 58          | 1,5        | 6                  | 2 | 11,81               | 12,33             | 12,77               | 13,16             | 13,53               | 13,86             |
| 13638302  | 3                      | 2,85       | 12         | 3            | 58          | 1,5        | 6                  | 2 | 13,91               | 14,47             | 14,96               | 15,38             | 15,77               | 16,33             |
| 13638304  | 3                      | 2,85       | 16         | 3            | 65          | 1,5        | 6                  | 2 | 18,08               | 18,74             | 19,29               | 19,77             | 20,51               | 21,63             |
| 13638306  | 3                      | 2,85       | 20         | 4            | 65          | 1,5        | 6                  | 2 | 22,24               | 22,98             | 23,59               | 24,28             | 25,54               | 26,94             |
| 13638400  | 4                      | 3,9        | 12         | 4,5          | 58          | 2          | 6                  | 2 | 13,77               | 14,37             | 14,87               | 15,31             | 15,7                | 16,17             |
| 13638404  | 4                      | 3,9        | 16         | 4,5          | 58          | 2          | 6                  | 2 | 17,96               | 18,65             | 19,22               | 19,71             | 20,36               | 20,87             |
| 13638406  | 4                      | 3,9        | 20         | 5            | 65          | 2          | 6                  | 2 | 22,12               | 22,9              | 23,52               | 24,14             | -                   | -                 |



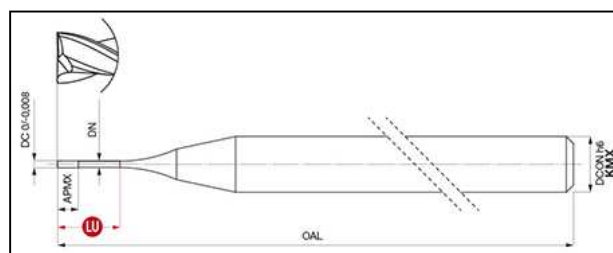
**Microfresa piana, HM, rivestita**  
**HM flat micro end mill, coated**
**Art. 13640** 

**Descrizione:**

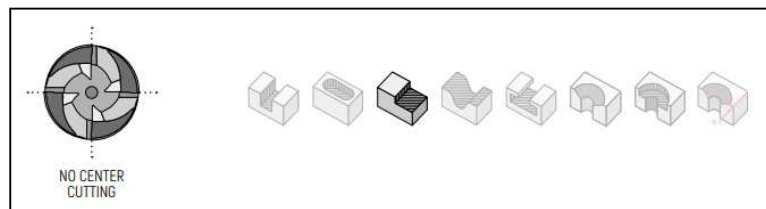
Microfresa a testa piana a 2 taglienti per nervature profonde, materiale metallo duro HM HSC per alta velocità di taglio, con rivestimento multistrato a base Ti e Al per fresatura di materiali duri e tenaci. Serie Micro per stampisti con profilo del tagliente HSC per la lavorazione di acciai temprati fino a 65 HRC, gambo cilindrico. Ulteriori dimensioni, lunghezze e raggi sono disponibili su richiesta.

2 flute flat micro end mill for rib processing, solid carbide HM HSC (High Speed Cutting) with Ti and Al based multi-coating for milling of hard and tough materials. Micro series for mold makers with HSC cutting edge profile for machining hardened steels up to 65 HRC, cylindrical shank. Other dimensions, lengths and radii are available upon request.


**ART. 13640**
**Dati tecnici / Technical data**

| Cod. Code | DC 0/-0,008 [mm] | DN [mm] | LU [mm] | APMX [mm] | OAL [mm] | DCON h6 [mm] | Z | H α=0,5° [mm] | H α=1° [mm] | H α=1,5° [mm] | H α=2° [mm] | H α=2,5° [mm] | H α=3° [mm] |
|-----------|------------------|---------|---------|-----------|----------|--------------|---|---------------|-------------|---------------|-------------|---------------|-------------|
| 13640054  | 0,5              | 0,48    | 4       | 1         | 50       | 4            | 2 | 4,99          | 5,4         | 5,74          | 6,05        | 6,34          | 6,6         |
| 13640056  | 0,5              | 0,48    | 6       | 1         | 50       | 4            | 2 | 7,16          | 7,64        | 8,05          | 8,4         | 8,73          | 9,03        |
| 13640064  | 0,6              | 0,58    | 4       | 1         | 50       | 4            | 2 | 4,99          | 5,4         | 5,74          | 6,05        | 6,34          | 6,6         |
| 13640066  | 0,6              | 0,58    | 6       | 1         | 50       | 4            | 2 | 7,16          | 7,64        | 8,05          | 8,4         | 8,73          | 9,03        |
| 13640081  | 0,8              | 0,77    | 2       | 0,5       | 50       | 4            | 2 | 2,83          | 3,14        | 3,39          | 3,64        | 3,86          | 4,09        |
| 13640082  | 0,8              | 0,77    | 6       | 0,5       | 50       | 4            | 2 | 7,2           | 7,66        | 8,06          | 8,42        | 8,75          | 9,05        |
| 13640083  | 0,8              | 0,77    | 10      | 0,5       | 50       | 4            | 2 | 11,47         | 12,03       | 12,55         | 12,98       | 13,36         | 13,69       |
| 13640084  | 0,8              | 0,77    | 4       | 1         | 50       | 4            | 2 | 5,04          | 5,43        | 5,77          | 6,08        | 6,36          | 6,63        |
| 13640086  | 0,8              | 0,77    | 6       | 1         | 50       | 4            | 2 | 7,2           | 7,66        | 8,07          | 8,42        | 8,75          | 9,05        |
| 13640100  | 1                | 0,95    | 5       | 1         | 58       | 6            | 2 | 6,21          | 6,63        | 6,95          | 7,31        | 7,61          | 7,89        |
| 13640104  | 1                | 0,95    | 10      | 1         | 58       | 6            | 2 | 11,53         | 12,12       | 12,6          | 13,02       | 13,4          | 13,75       |
| 13640106  | 1                | 0,95    | 3       | 0,8       | 50       | 4            | 2 | 4,05          | 4,35        | 4,67          | 4,94        | 5,19          | 5,43        |
| 13640107  | 1                | 0,95    | 4       | 0,8       | 50       | 4            | 2 | 5,13          | 5,51        | 5,83          | 6,13        | 6,41          | 6,67        |
| 13640108  | 1                | 0,95    | 6       | 0,8       | 50       | 4            | 2 | 7,27          | 7,74        | 8,12          | 8,47        | 8,79          | 9,08        |
| 13640109  | 1                | 0,95    | 8       | 0,8       | 50       | 4            | 2 | 9,41          | 9,93        | 10,37         | 10,76       | 11,11         | 11,44       |
| 13640110  | 1                | 0,95    | 10      | 0,8       | 50       | 4            | 2 | 11,53         | 12,11       | 12,6          | 13,02       | 13,4          | 13,75       |
| 13640111  | 1                | 0,95    | 12      | 0,8       | 55       | 4            | 2 | 13,63         | 14,28       | 14,8          | 15,25       | 15,65         | 16,03       |
| 13640112  | 1                | 0,95    | 16      | 0,8       | 55       | 4            | 2 | 17,85         | 18,58       | 19,16         | 19,66       | 20,23         | 21,34       |
| 13640113  | 1                | 0,95    | 20      | 0,8       | 60       | 4            | 2 | 22,03         | 22,83       | 23,47         | 24,02       | 25,27         | 26,65       |
| 13640120  | 1,2              | 1,15    | 8       | 1,1       | 50       | 4            | 2 | 9,41          | 9,93        | 10,37         | 10,76       | 11,11         | 11,43       |
| 13640121  | 1,2              | 1,15    | 12      | 1,1       | 55       | 4            | 2 | 13,64         | 14,28       | 14,8          | 15,25       | 15,65         | 16,03       |
| 13640140  | 1,4              | 1,34    | 8       | 1,3       | 50       | 4            | 2 | 9,45          | 9,96        | 10,4          | 10,78       | 11,13         | 11,45       |
| 13640141  | 1,4              | 1,34    | 16      | 1,3       | 55       | 4            | 2 | 17,87         | 18,59       | 19,17         | 19,67       | 20,26         | 21,37       |
| 13640150  | 1,5              | 1,44    | 8       | 1,5       | 58       | 6            | 2 | 9,45          | 9,96        | 10,4          | 10,78       | 11,13         | 11,45       |
| 13640154  | 1,5              | 1,44    | 12      | 1,5       | 58       | 6            | 2 | 13,67         | 14,3        | 14,82         | 15,26       | 15,67         | 16,06       |
| 13640155  | 1,5              | 1,44    | 8       | 1,35      | 50       | 4            | 2 | 9,45          | 9,96        | 10,4          | 10,78       | 11,13         | 11,45       |
| 13640156  | 1,5              | 1,44    | 12      | 1,35      | 55       | 4            | 2 | 13,67         | 14,3        | 14,82         | 15,26       | 15,67         | 16,06       |
| 13640157  | 1,5              | 1,44    | 20      | 1,35      | 60       | 4            | 2 | 22,05         | 22,85       | 23,49         | 24,05       | 25,3          | -           |
| 13640160  | 1,6              | 1,54    | 12      | 1,4       | 55       | 4            | 2 | 13,67         | 14,3        | 14,82         | 15,26       | 15,67         | 16,06       |
| 13640161  | 1,6              | 1,54    | 20      | 1,4       | 60       | 4            | 2 | 22,05         | 22,85       | 23,49         | 24,05       | 25,3          | -           |
| 13640180  | 1,8              | 1,73    | 12      | 1,6       | 55       | 4            | 2 | 13,7          | 14,32       | 14,83         | 15,28       | 15,68         | 16,1        |
| 13640181  | 1,8              | 1,73    | 20      | 1,6       | 60       | 4            | 2 | 22,07         | 22,87       | 23,5          | 24,08       | -             | -           |
| 13640200  | 2                | 1,92    | 10      | 2         | 58       | 6            | 2 | 11,63         | 12,19       | 12,66         | 13,07       | 13,44         | 13,79       |
| 13640202  | 2                | 1,92    | 12      | 2         | 58       | 6            | 2 | 13,73         | 14,35       | 14,85         | 15,29       | 15,69         | 16,13       |
| 13640204  | 2                | 1,92    | 16      | 2         | 65       | 6            | 2 | 17,92         | 18,63       | 19,2          | 19,7        | 20,32         | 21,44       |
| 13640206  | 2                | 1,92    | 20      | 2         | 65       | 6            | 2 | 22,1          | 22,89       | 23,52         | 24,11       | 25,36         | 26,75       |
| 13640208  | 2                | 1,92    | 6       | 1,7       | 50       | 4            | 2 | 7,4           | 7,83        | 8,2           | 8,54        | 8,85          | 9,14        |
| 13640209  | 2                | 1,92    | 8       | 1,7       | 50       | 4            | 2 | 9,52          | 10,02       | 10,44         | 10,82       | 11,16         | 11,48       |
| 13640210  | 2                | 1,92    | 10      | 1,7       | 50       | 4            | 2 | 11,63         | 12,19       | 12,66         | 13,07       | 13,44         | 13,79       |
| 13640211  | 2                | 1,92    | 12      | 1,7       | 55       | 4            | 2 | 13,73         | 14,35       | 14,85         | 15,29       | 15,69         | 16,13       |
| 13640212  | 2                | 1,92    | 16      | 1,7       | 55       | 4            | 2 | 17,92         | 18,63       | 19,2          | 19,7        | 20,32         | -           |
| 13640213  | 2                | 1,92    | 20      | 1,7       | 60       | 4            | 2 | 22,1          | 22,89       | 23,52         | 24,11       | -             | -           |
| 13640214  | 2                | 1,92    | 25      | 1,7       | 65       | 4            | 2 | 22,79         | 28,17       | 28,86         | -           | -             | -           |
| 13640215  | 2                | 1,92    | 30      | 1,7       | 70       | 4            | 2 | 32,47         | 33,43       | 34,38         | -           | -             | -           |
| 13640250  | 2,5              | 2,4     | 13      | 2         | 58       | 6            | 2 | 14,84         | 15,46       | 15,98         | 16,43       | 16,84         | 17,51       |
| 13640299  | 3                | 2,85    | 10      | 2,5       | 58       | 6            | 2 | 11,81         | 12,33       | 12,77         | 13,16       | 13,53         | 13,86       |
| 13640300  | 3                | 2,85    | 8       | 3         | 58       | 6            | 2 | 9,71          | 10,17       | 10,57         | 10,93       | 11,26         | 11,57       |
| 13640302  | 3                | 2,85    | 12      | 3         | 58       | 6            | 2 | 13,91         | 14,47       | 14,96         | 15,38       | 15,77         | 16,33       |
| 13640304  | 3                | 2,85    | 16      | 3         | 65       | 6            | 2 | 18,08         | 18,74       | 19,29         | 19,77       | 20,51         | 21,63       |
| 13640306  | 3                | 2,85    | 20      | 3         | 65       | 6            | 2 | 22,24         | 22,98       | 23,59         | 24,28       | 25,54         | 26,94       |
| 13640400  | 4                | 3,9     | 12      | 4,5       | 58       | 6            | 2 | 13,77         | 14,37       | 14,87         | 15,31       | 15,7          | 16,17       |
| 13640404  | 4                | 3,9     | 16      | 4,5       | 58       | 6            | 2 | 17,96         | 18,65       | 19,22         | 19,71       | 20,36         | 20,87       |
| 13640406  | 4                | 3,9     | 20      | 5         | 65       | 6            | 2 | 22,12         | 22,9        | 23,52         | 24,14       | -             | -           |



**Fresa per finitura corta, HSS-CoPM  
HSS-CoPM finishing short end mill**
**Art. 13660** 

**Descrizione:**

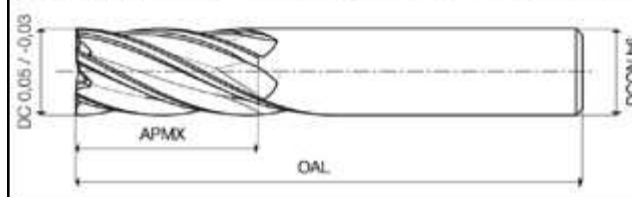
Fresa a finire per contornatura, materiale HSS-Co8,5% sinterizzato con finitura lucida, UNI 8244, DIN 844A, ISO 1641/I. Profilo del tagliente N per finitura di materiali medio-legati, serie corta, gambo cilindrico; gambo Weldon o filettato fornibile su richiesta.

Finishing shouldering end mill, sintered HSS-Co8,5% with bright finish, UNI 8244, DIN 844A, ISO 1641/I. Cutting edge profile N for finishing medium-alloy materials, short length, cylindrical shank; Weldon or threaded shank available upon request.

|                                                                                     |           |                                                                                    |
|-------------------------------------------------------------------------------------|-----------|------------------------------------------------------------------------------------|
| PMCo<br>8,5%                                                                        | N         |  |
|  | λ's<br>32 | lucido<br>bright                                                                   |

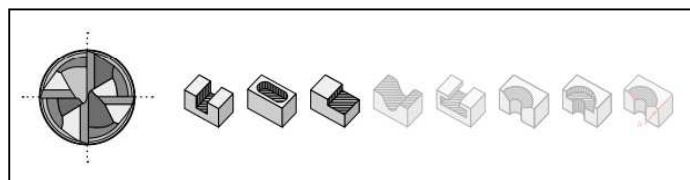
**ART. 13660**
**Dati tecnici / Technical data**

| Cod.<br>Code | DC<br>+0,05/-0,03<br>[mm] | APMX<br>[mm] | OAL<br>[mm] | DCON<br>h6<br>[mm] | Z |
|--------------|---------------------------|--------------|-------------|--------------------|---|
| 13660020     | 2                         | 7            | 51          | 6                  | 4 |
| 13660025     | 2,5                       | 8            | 52          | 6                  | 4 |
| 13660030     | 3                         | 8            | 52          | 6                  | 4 |
| 13660035     | 3,5                       | 10           | 54          | 6                  | 4 |
| 13660040     | 4                         | 11           | 55          | 6                  | 4 |
| 13660045     | 4,5                       | 11           | 55          | 6                  | 4 |
| 13660050     | 5                         | 13           | 57          | 6                  | 4 |
| 13660055     | 5,5                       | 13           | 57          | 6                  | 4 |
| 13660060     | 6                         | 13           | 57          | 6                  | 4 |
| 13660065     | 6,5                       | 16           | 66          | 10                 | 4 |
| 13660070     | 7                         | 16           | 66          | 10                 | 4 |
| 13660080     | 8                         | 19           | 69          | 10                 | 4 |
| 13660090     | 9                         | 19           | 69          | 10                 | 4 |
| 13660100     | 10                        | 22           | 72          | 10                 | 4 |
| 13660110     | 11                        | 22           | 79          | 12                 | 4 |
| 13660120     | 12                        | 26           | 83          | 12                 | 4 |
| 13660130     | 13                        | 26           | 83          | 12                 | 4 |
| 13660140     | 14                        | 26           | 83          | 12                 | 4 |
| 13660150     | 15                        | 32           | 92          | 16                 | 4 |
| 13660160     | 16                        | 32           | 92          | 16                 | 4 |
| 13660170     | 17                        | 32           | 92          | 16                 | 4 |
| 13660180     | 18                        | 32           | 92          | 16                 | 4 |
| 13660190     | 19                        | 38           | 98          | 16                 | 4 |
| 13660200     | 20                        | 38           | 104         | 20                 | 4 |
| 13660250     | 25                        | 45           | 121         | 25                 | 5 |
| 13660260     | 26                        | 45           | 121         | 25                 | 5 |
| 13660300     | 30                        | 45           | 121         | 25                 | 6 |



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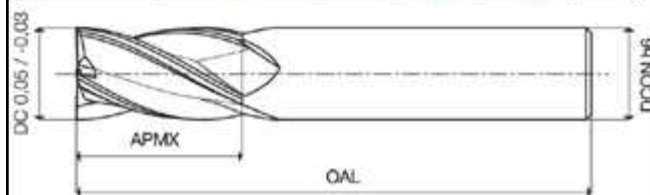
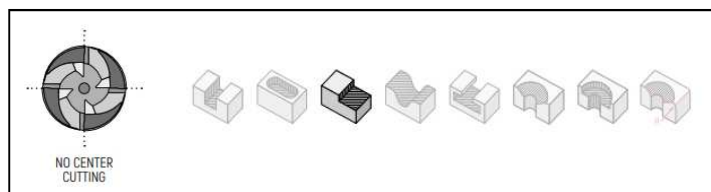
**Fresa per finitura corta, HSS-CoPM, taglio al centro**  
**HSS-CoPM finishing short end mill, center cut**
**Art. 13663** 

**Descrizione:**

Fresa a finire per contornatura con taglio al centro, materiale HSS-Co8,5% sinterizzato con finitura lucida, UNI 8244, DIN 844A, ISO 1641/I. Profilo del tagliente N per finitura di materiali medio-legati, serie corta, gambo cilindrico; gambo Weldon o filettato fornibile su richiesta.

Finishing shouldering end mill with center cut, sintered HSS-Co8,5% with bright finish, UNI 8244, DIN 844A, ISO 1641/I. Cutting edge profile N for finishing medium-alloy materials, short length, cylindrical shank; Weldon or threaded shank available upon request.

|                                                                                     |           |                                                                                    |
|-------------------------------------------------------------------------------------|-----------|------------------------------------------------------------------------------------|
| PMCo<br>8,5%                                                                        | N         |  |
|  | λ'S<br>32 | lucido<br>bright                                                                   |

| <b>ART. 13663</b>                    |                           |              |             |                    |   |
|--------------------------------------|---------------------------|--------------|-------------|--------------------|---|
| <b>Dati tecnici / Technical data</b> |                           |              |             |                    |   |
| Cod.<br>Code                         | DC<br>+0,05/-0,03<br>[mm] | APMX<br>[mm] | OAL<br>[mm] | DCON<br>h6<br>[mm] | Z |
| 13663020                             | 2                         | 7            | 51          | 6                  | 4 |
| 13663030                             | 3                         | 8            | 52          | 6                  | 4 |
| 13663040                             | 4                         | 11           | 55          | 6                  | 4 |
| 13663050                             | 5                         | 13           | 57          | 6                  | 4 |
| 13663060                             | 6                         | 13           | 57          | 6                  | 4 |
| 13663080                             | 8                         | 19           | 69          | 10                 | 4 |
| 13663100                             | 10                        | 22           | 72          | 10                 | 4 |
| 13663120                             | 12                        | 26           | 83          | 12                 | 4 |
| 13663140                             | 14                        | 26           | 83          | 12                 | 4 |
| 13663150                             | 15                        | 32           | 92          | 16                 | 4 |
| 13663160                             | 16                        | 32           | 92          | 16                 | 4 |
| 13663180                             | 18                        | 32           | 92          | 16                 | 4 |
| 13663200                             | 20                        | 38           | 98          | 16                 | 4 |
| 13663205                             | 20                        | 38           | 104         | 20                 | 4 |

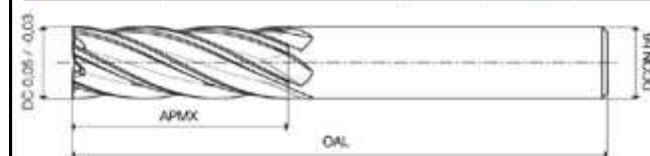

**Fresa per finitura lunga, HSS-CoPM**  
**HSS-CoPM finishing long end mill**
**Art. 13671** 

**Descrizione:**

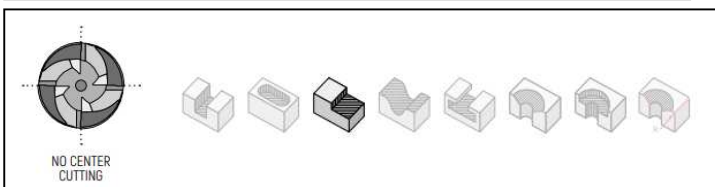
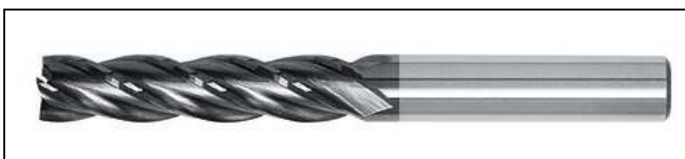
Fresa a finire per contornatura, materiale HSS-Co8,5% sinterizzato con finitura lucida, UNI 8244, DIN 844A, ISO 1641/I. Profilo del tagliente N per finitura di materiali medio-legati, serie lunga, gambo cilindrico; gambo Weldon o filettato fornibile su richiesta.

Finishing shouldering end mill, sintered HSS-Co8,5% with bright finish, UNI 8244, DIN 844A, ISO 1641/I. Cutting edge profile N for finishing medium-alloy materials, long length, cylindrical shank; Weldon or threaded shank available upon request.

|                                                                                     |           |                                                                                     |
|-------------------------------------------------------------------------------------|-----------|-------------------------------------------------------------------------------------|
| PMCo<br>8,5%                                                                        | N         |  |
|  | λ'S<br>32 | lucido<br>bright                                                                    |

| <b>ART. 13671</b>                    |                           |              |             |                    |   |
|--------------------------------------|---------------------------|--------------|-------------|--------------------|---|
| <b>Dati tecnici / Technical data</b> |                           |              |             |                    |   |
| Cod.<br>Code                         | DC<br>+0,05/-0,03<br>[mm] | APMX<br>[mm] | OAL<br>[mm] | DCON<br>h6<br>[mm] | Z |
| 13671030                             | 3                         | 12           | 56          | 6                  | 4 |
| 13671040                             | 4                         | 19           | 63          | 6                  | 4 |
| 13671050                             | 5                         | 24           | 68          | 6                  | 4 |
| 13671060                             | 6                         | 24           | 68          | 6                  | 4 |
| 13671070                             | 7                         | 30           | 80          | 10                 | 4 |
| 13671080                             | 8                         | 38           | 88          | 10                 | 4 |
| 13671090                             | 9                         | 38           | 88          | 10                 | 4 |
| 13671100                             | 10                        | 45           | 95          | 10                 | 4 |
| 13671110                             | 11                        | 45           | 102         | 12                 | 4 |
| 13671120                             | 12                        | 53           | 110         | 12                 | 4 |
| 13671140                             | 14                        | 53           | 110         | 12                 | 4 |
| 13671150                             | 15                        | 63           | 123         | 16                 | 4 |
| 13671160                             | 16                        | 63           | 123         | 16                 | 4 |
| 13671160                             | 18                        | 63           | 123         | 16                 | 4 |
| 13671201                             | 20                        | 75           | 141         | 20                 | 4 |



**Fresa per finitura lunga, HSS-CoPM, rivestita  
HSS-CoPM finishing long end mill, coated**

**Descrizione:**

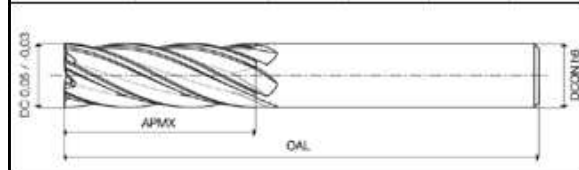
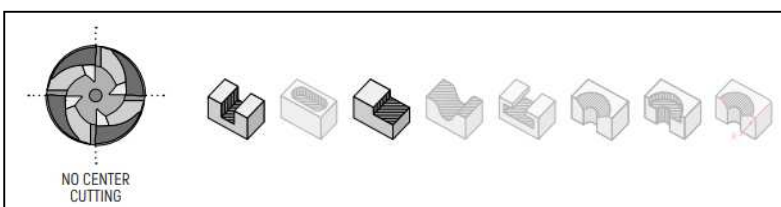
Fresa a finire per contornatura, materiale HSS-Co8,5% sinterizzato con rivestimento multistrato a base Ti e Al per acciai, ghise, inox, titanio, HRSA; UNI 8244, DIN 844A, ISO 1641/I. Profilo del tagliente N per finitura di materiali medio-legati, serie lunga, gambo cilindrico; gambo Weldon o filettato fornibile su richiesta.

|                                                                                   |                          |                                                                                   |
|-----------------------------------------------------------------------------------|--------------------------|-----------------------------------------------------------------------------------|
| PMCo<br>8,5%                                                                      | N                        |  |
|  | $\lambda^{\circ}S$<br>32 | Skin                                                                              |

Finishing shouldering end mill, sintered HSS-Co8,5% with Ti and Al based multi-coating for steel, cast, iron, inox, titanium, HRSA; UNI 8244, DIN 844A, ISO 1641/I. Cutting edge profile N for finishing medium-alloy materials, long length, cylindrical shank; Weldon or threaded shank available upon request.

**Art. 13680** 
**ART. 13680**
**Dati tecnici / Technical data**

| Cod.<br>Code | DC<br>+0,05/-0,03<br>[mm] | APMX<br>[mm] | OAL<br>[mm] | DCON<br>h6<br>[mm] | Z |
|--------------|---------------------------|--------------|-------------|--------------------|---|
| 13680030     | 3                         | 12           | 56          | 6                  | 4 |
| 13680040     | 4                         | 19           | 63          | 6                  | 4 |
| 13680050     | 5                         | 24           | 68          | 6                  | 4 |
| 13680060     | 6                         | 24           | 68          | 6                  | 4 |
| 13680080     | 8                         | 38           | 88          | 10                 | 4 |
| 13680100     | 10                        | 45           | 95          | 10                 | 4 |
| 13680120     | 12                        | 53           | 110         | 12                 | 4 |
| 13680140     | 14                        | 53           | 110         | 12                 | 4 |
| 13680160     | 16                        | 63           | 123         | 16                 | 4 |
| 13680180     | 18                        | 63           | 123         | 16                 | 4 |
| 13680200     | 20                        | 75           | 141         | 20                 | 4 |


**Fresa per finitura corta 45°, HSS-CoPM  
HSS-CoPM finishing short end mill 45°**

**Descrizione:**

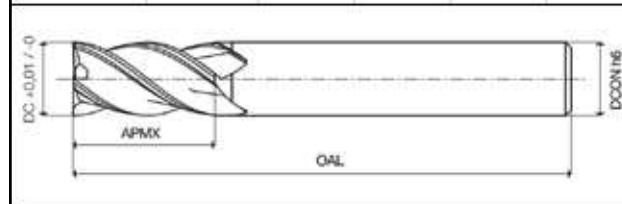
Fresa a finire per contornatura, materiale HSS-Co8,5% sinterizzato con finitura lucida, UNI 8244, DIN 844A, ISO 1641/I. Profilo del tagliente N per finitura di materiali medio-legati, angolo dell'elica a 45° per la lavorazione di una vasta gamma di materiali, serie corta, gambo cilindrico; gambo Weldon o filettato fornibile su richiesta.

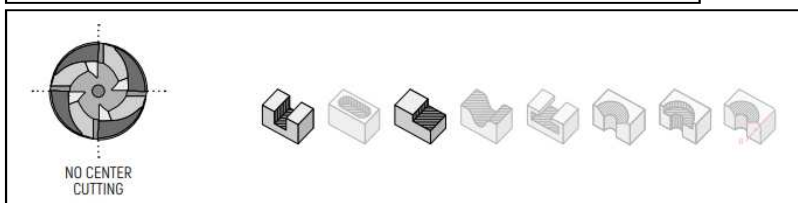
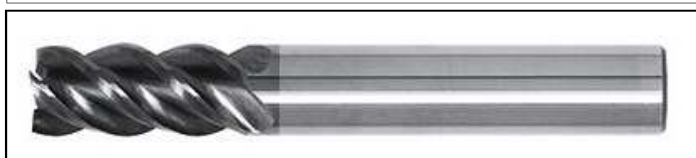
Finishing shouldering end mill, sintered HSS-Co8,5% with bright finish, UNI 8244, DIN 844A, ISO 1641/I. Cutting edge profile N for finishing medium-alloy materials, 45° helix angle for machining a wide range of materials, short length, cylindrical shank; Weldon or threaded shank available upon request.

|                                                                                     |                          |                                                                                     |
|-------------------------------------------------------------------------------------|--------------------------|-------------------------------------------------------------------------------------|
| PMCo<br>8,5%                                                                        | N                        |  |
|  | $\lambda^{\circ}S$<br>45 | lucido<br>bright                                                                    |

**Art. 13690** 
**ART. 13690**
**Dati tecnici / Technical data**

| Cod.<br>Code | DC<br>+0,01/-0<br>[mm] | APMX<br>[mm] | OAL<br>[mm] | DCON<br>h6<br>[mm] | Z |
|--------------|------------------------|--------------|-------------|--------------------|---|
| 13690040     | 4                      | 11           | 55          | 6                  | 4 |
| 13690050     | 5                      | 13           | 57          | 6                  | 4 |
| 13690060     | 6                      | 13           | 57          | 6                  | 4 |
| 13690080     | 8                      | 19           | 69          | 10                 | 4 |
| 13690100     | 10                     | 22           | 72          | 10                 | 4 |
| 13690120     | 12                     | 26           | 83          | 12                 | 4 |
| 13690160     | 16                     | 32           | 92          | 16                 | 4 |
| 13690200     | 20                     | 38           | 104         | 20                 | 4 |



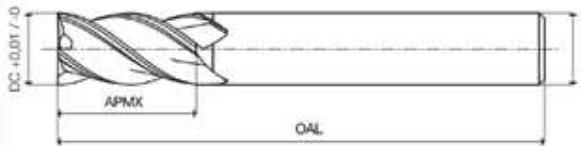
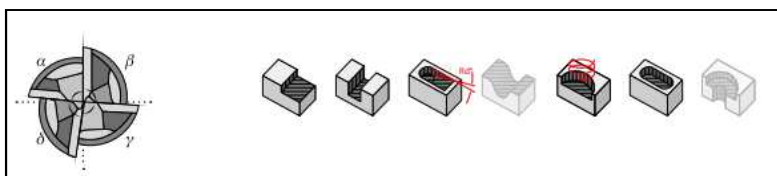
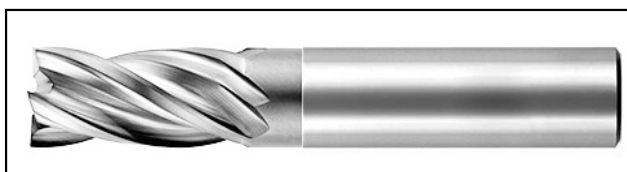
**Fresa per finitura corta 45°, HSS-CoPM, rivestita  
HSS-CoPM finishing short end mill 45°, coated**
**Art. 13700** 

**Descrizione:**

Fresa a finire per contornatura, materiale HSS-Co8,5% sinterizzato con rivestimento multistrato a base Ti e Al per acciai, ghise, inox, titanio, HRSA; UNI 8244, DIN 844A, ISO 1641/I. Profilo del tagliente N per finitura di materiali medio-legati, angolo dell'elica a 45° per la lavorazione di una vasta gamma di materiali, serie corta, gambo cilindrico; gambo Weldon o filettato fornibile su richiesta.

Finishing shouldering end mill, sintered HSS-Co8,5% with Ti and Al based multi-coating for steel, cast, iron, inox, titanium, HRSA; UNI 8244, DIN 844A, ISO 1641/I. Cutting edge profile N for finishing medium-alloy materials, 45° helix angle for machining a wide range of materials, short length, cylindrical shank; Weldon or threaded shank available upon request.

|      |     |      |
|------|-----|------|
| PMCo | N   |      |
| 8,5% |     |      |
|      | λ's | SKIN |
|      | 45  |      |

| ART. 13700                    |                  |           |          |              |   |
|-------------------------------|------------------|-----------|----------|--------------|---|
| Dati tecnici / Technical data |                  |           |          |              |   |
| Cod. Code                     | DC +0,01/-0 [mm] | APMX [mm] | OAL [mm] | DCON h6 [mm] | Z |
| 13700020                      | 2                | 7         | 51       | 6            | 4 |
| 13700030                      | 3                | 8         | 52       | 6            | 4 |
| 13700040                      | 4                | 11        | 55       | 6            | 4 |
| 13700050                      | 5                | 13        | 57       | 6            | 4 |
| 13700060                      | 6                | 13        | 57       | 6            | 4 |
| 13700070                      | 7                | 16        | 66       | 10           | 4 |
| 13700080                      | 8                | 19        | 69       | 10           | 4 |
| 13700100                      | 10               | 22        | 72       | 10           | 4 |
| 13700120                      | 12               | 26        | 83       | 12           | 4 |
| 13700140                      | 14               | 26        | 83       | 12           | 4 |
| 13700150                      | 15               | 32        | 92       | 16           | 4 |
| 13700160                      | 16               | 32        | 92       | 16           | 4 |
| 13700180                      | 18               | 32        | 92       | 16           | 4 |
| 13700200                      | 20               | 38        | 104      | 20           | 4 |

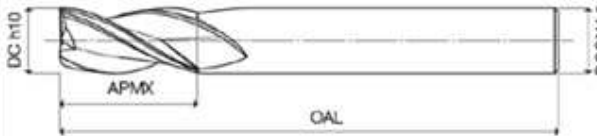

**Fresa a 4 taglienti corta, HM  
HM 4 flute short end mill**
**Art. 13711** 

**Descrizione:**

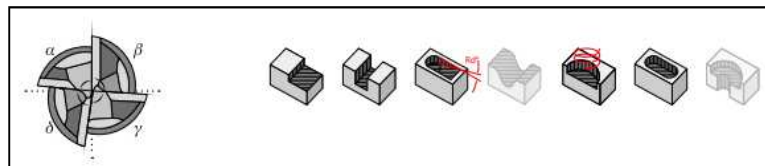
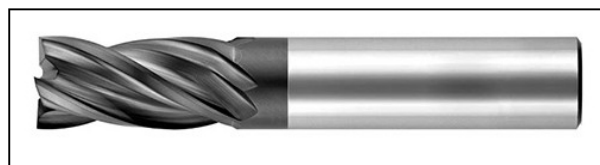
Fresa a 4 taglienti per apertura cava e contornatura, materiale metallo duro HM con finitura lucida; UNI DIN ISO 6528. Profilo del tagliente H per lavorazioni di materiali alto-legati, geometria a divisione irregolare, dal diametro mm 6,5 in poi eliche differenziate 30°/32° per la lavorazione di una vasta gamma di materiali; serie corta, gambo cilindrico, gambo Weldon fornibile su richiesta.

4 flute milling end mill for slotting and shouldering, solid carbide HM with bright finish; UNI DIN ISO 6528. Cutting edge profile H for the machining of high-alloyed materials, geometry with irregular division, from diameter mm 6,5 up different helices 30°/32° for machining a wide range of materials; short length, cylindrical shank; Weldon shank available upon request.

|    |     |        |
|----|-----|--------|
| HM | H   |        |
|    | λ's | lucido |
|    | 30  | bright |

| ART. 13711                    |             |           |          |              |   |
|-------------------------------|-------------|-----------|----------|--------------|---|
| Dati tecnici / Technical data |             |           |          |              |   |
| Cod. Code                     | DC h10 [mm] | APMX [mm] | OAL [mm] | DCON h6 [mm] | Z |
| 13711020                      | 2           | 7         | 40       | 2            | 4 |
| 13711025                      | 2,5         | 10        | 40       | 2,5          | 4 |
| 13711030                      | 3           | 10        | 40       | 3            | 4 |
| 13711035                      | 3,5         | 11        | 50       | 3,5          | 4 |
| 13711040                      | 4           | 11        | 50       | 4            | 4 |
| 13711045                      | 4,5         | 13        | 50       | 4,5          | 4 |
| 13711050                      | 5           | 13        | 50       | 5            | 4 |
| 13711060                      | 6           | 16        | 57       | 6            | 4 |
| 13711070                      | 7           | 16        | 60       | 7            | 4 |
| 13711080                      | 8           | 19        | 63       | 8            | 4 |
| 13711090                      | 9           | 19        | 67       | 9            | 4 |
| 13711100                      | 10          | 22        | 72       | 10           | 4 |
| 13711120                      | 12          | 26        | 83       | 12           | 4 |
| 13711160                      | 16          | 32        | 92       | 16           | 4 |
| 13711180                      | 18          | 32        | 92       | 18           | 4 |
| 13711200                      | 20          | 38        | 104      | 20           | 4 |



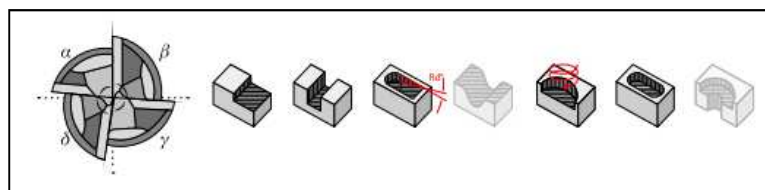
**Fresa a 4 taglienti corta, HM, rivestita  
HM 4 flute short end mill, coated**
**Art. 13715** 

**Descrizione:**

Fresa a 4 taglienti per apertura cava e contornatura, materiale metallo duro HM con rivestimento multistrato a base Ti e Al per tutti i tipi di materiali; UNI DIN ISO 6528. Profilo del tagliente H per lavorazioni di materiali alto-legati, geometria a divisione irregolare, dal diametro mm 6,5 in poi eliche differenziate 30°/32° per la lavorazione di una vasta gamma di materiali; serie corta, gambo cilindrico, gambo Weldon fornibile su richiesta.

4 flute end mill for slotting and shouldering, solid carbide HM with Ti and Al based multi-coating for every kind of materials; UNI DIN ISO 6528. Cutting edge profile H for the machining of high-alloyed materials, geometry with irregular division, from diameter mm 6,5 up different helices 30°/32° for machining a wide range of materials; short length, cylindrical shank; Weldon shank available upon request.



| <b>ART. 13715</b>                    |             |           |          |              |   |
|--------------------------------------|-------------|-----------|----------|--------------|---|
| <b>Dati tecnici / Technical data</b> |             |           |          |              |   |
| Cod. Code                            | DC h10 [mm] | APMX [mm] | OAL [mm] | DCON h6 [mm] | Z |
| 13715020                             | 2           | 7         | 40       | 2            | 4 |
| 13715030                             | 3           | 10        | 40       | 3            | 4 |
| 13715040                             | 4           | 11        | 50       | 4            | 4 |
| 13715050                             | 5           | 13        | 50       | 5            | 4 |
| 13715060                             | 6           | 16        | 57       | 6            | 4 |
| 13715080                             | 8           | 19        | 63       | 8            | 4 |
| 13715100                             | 10          | 22        | 72       | 10           | 4 |
| 13715120                             | 12          | 26        | 83       | 12           | 4 |
| 13715140                             | 14          | 28        | 83       | 14           | 4 |
| 13715160                             | 16          | 32        | 92       | 16           | 4 |


**Fresa a 4 taglienti lunga, HM  
HM 4 flute long end mill**
**Art. 13720** 

**Descrizione:**

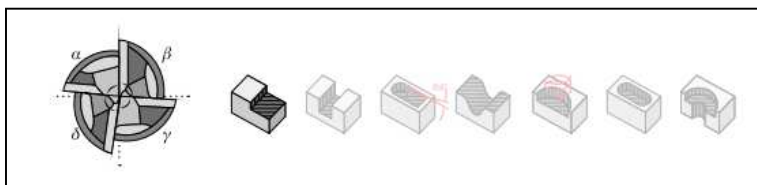
Fresa a 4 taglienti, materiale metallo duro HM con finitura lucida. Profilo del tagliente H per lavorazioni di materiali alto-legati, geometria a divisione irregolare per la lavorazione di una vasta gamma di materiali; serie lunga, gambo cilindrico, gambo Weldon fornibile su richiesta.

4 flute end mill, solid carbide HM with bright finish. Cutting edge profile H for the machining of high-alloyed materials, geometry with irregular division for machining a wide range of materials; long length, cylindrical shank; Weldon shank available upon request.



| <b>ART. 13720</b>                    |             |           |          |              |   |
|--------------------------------------|-------------|-----------|----------|--------------|---|
| <b>Dati tecnici / Technical data</b> |             |           |          |              |   |
| Cod. Code                            | DC h10 [mm] | APMX [mm] | OAL [mm] | DCON h6 [mm] | Z |
| 13720030                             | 3           | 20        | 55       | 3            | 4 |
| 13720040                             | 4           | 20        | 60       | 4            | 4 |
| 13720050                             | 5           | 20        | 60       | 5            | 4 |
| 13720060                             | 6           | 24        | 65       | 6            | 4 |
| 13720080                             | 8           | 32        | 80       | 8            | 4 |
| 13720100                             | 10          | 32        | 80       | 10           | 4 |
| 13720120                             | 12          | 50        | 100      | 12           | 4 |



**Frese - Frese per finitura- Frese per sgrossatura**
**Fresa a 4 taglienti extralunga, HM  
HM 4 flute extralong end mill**
**Art. 13730** 

**Descrizione:**

Fresa a 4 taglienti, materiale metallo duro HM con finitura lucida. Profilo del tagliente H per lavorazioni di materiali alto-legati, geometria a divisione irregolare per la lavorazione di una vasta gamma di materiali; serie extralunga, gambo cilindrico, gambo Weldon fornibile su richiesta.

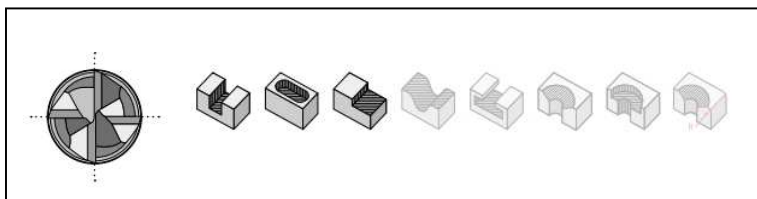
4 flute end mill, solid carbide HM with bright finish. Cutting edge profile H for the machining of high-alloyed materials, geometry with irregular division for machining a wide range of materials; extralong length, cylindrical shank; Weldon shank available upon request.

|                                                                                    |           |                                                                                   |
|------------------------------------------------------------------------------------|-----------|-----------------------------------------------------------------------------------|
| HM                                                                                 | H         |  |
|  | λ'S<br>30 | lucido<br>bright                                                                  |

| ART. 13730                    |                   |              |             |                    |   |
|-------------------------------|-------------------|--------------|-------------|--------------------|---|
| Dati tecnici / Technical data |                   |              |             |                    |   |
| Cod.<br>Code                  | DC<br>h10<br>[mm] | APMX<br>[mm] | OAL<br>[mm] | DCON<br>h6<br>[mm] | Z |
| 13730040                      | 4                 | 32           | 72          | 4                  | 4 |
| 13730050                      | 5                 | 32           | 80          | 5                  | 4 |
| 13730060                      | 6                 | 40           | 82          | 6                  | 4 |
| 13730080                      | 8                 | 42           | 100         | 8                  | 4 |
| 13730100                      | 10                | 45           | 100         | 10                 | 4 |
| 13730120                      | 12                | 75           | 160         | 12                 | 4 |



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[info@gnuttibortolo.com](mailto:info@gnuttibortolo.com)

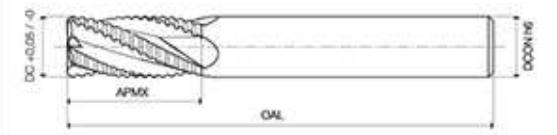

**Frese - Frese per sgrossatura**
**Fresa per sgrossatura corta, HSS-CoPM, taglio al centro  
HSS-CoPM roughing short end mill, center cut**
**Art. 13750** 

**Descrizione:**

Fresa a sgrossare per contornatura con taglio al centro, materiale HSS-Co8,5% sinterizzato con finitura lucida, UNI 8244, DIN 844A, ISO 1641/I. Profilo del tagliente NR per sgrossatura di materiali medio-legati, serie corta, gambo cilindrico; gambo Weldon o filettato fornibile su richiesta.

Roughing shouldering end mill with center cut, sintered HSS-Co8,5% with bright finish, UNI 8244, DIN 844A, ISO 1641/I. Cutting edge profile NR for roughing medium-alloy materials, short length, cylindrical shank; Weldon or threaded shank available upon request.

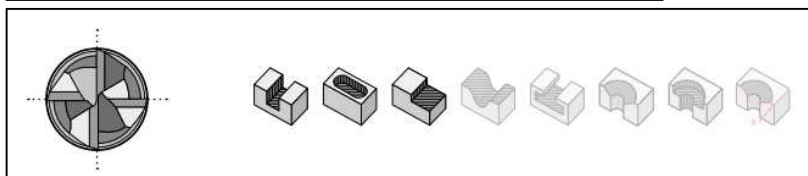
|                                                                                     |           |                                                                                     |
|-------------------------------------------------------------------------------------|-----------|-------------------------------------------------------------------------------------|
| PMCo<br>8,5%                                                                        | NR        |  |
|  | λ'S<br>28 | lucido<br>bright                                                                    |

| ART. 13750                    |                        |              |             |                    |   |
|-------------------------------|------------------------|--------------|-------------|--------------------|---|
| Dati tecnici / Technical data |                        |              |             |                    |   |
| Cod.<br>Code                  | DC<br>+0,05/-0<br>[mm] | APMX<br>[mm] | OAL<br>[mm] | DCON<br>h6<br>[mm] | Z |
| 13750060                      | 6                      | 13           | 57          | 6                  | 3 |
| 13750070                      | 7                      | 16           | 66          | 10                 | 3 |
| 13750080                      | 8                      | 19           | 69          | 10                 | 4 |
| 13750090                      | 9                      | 19           | 69          | 10                 | 4 |
| 13750100                      | 10                     | 22           | 72          | 10                 | 4 |
| 13750120                      | 12                     | 26           | 83          | 12                 | 4 |
| 13750130                      | 13                     | 26           | 83          | 12                 | 4 |
| 13750140                      | 14                     | 26           | 83          | 12                 | 4 |
| 13750150                      | 15                     | 32           | 92          | 16                 | 4 |
| 13750160                      | 16                     | 32           | 92          | 16                 | 4 |
| 13750170                      | 17                     | 32           | 92          | 16                 | 4 |
| 13750180                      | 18                     | 32           | 92          | 16                 | 4 |
| 13750200                      | 20                     | 38           | 98          | 16                 | 4 |
| 13750207                      | 20                     | 38           | 104         | 20                 | 4 |



**Fresa per sgrossatura corta, HSS-CoPM, taglio al centro, rivestita**  
**HSS-CoPM roughing short end mill, center cut, coated**

**Art. 13753** 



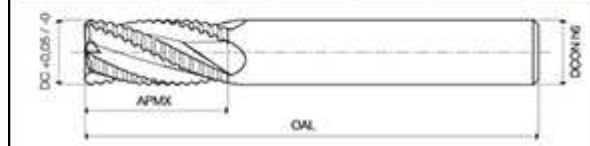
**Descrizione:**

Fresa a sgrossare per contornatura con taglio al centro, materiale HSS-Co8,5% sinterizzato con rivestimento multistrato a base Ti e Al per acciai, ghise, inox, titanio, HRSA, UNI 8244, DIN 844A, ISO 1641/I. Profilo del tagliente NR per sgrossatura di materiali medio-legati, serie corta, gambo cilindrico; gambo Weldon o filettato fornibile su richiesta.

Roughing shouldering end mill with center cut, sintered HSS-Co8,5% with Ti and Al based multi-coating for steel, cast, iron, inox, titanium, HRSA; UNI 8244, DIN 844A, ISO 1641/I. Cutting edge profile NR for roughing medium-alloy materials, short length, cylindrical shank; Weldon or threaded shank available upon request.

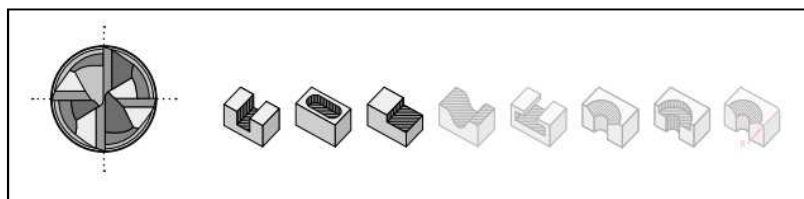


| <b>ART. 13753</b>                    |                  |           |          |              |   |
|--------------------------------------|------------------|-----------|----------|--------------|---|
| <b>Dati tecnici / Technical data</b> |                  |           |          |              |   |
| Cod. Code                            | DC +0,05/-0 [mm] | APMX [mm] | OAL [mm] | DCON h6 [mm] | Z |
| 13753060                             | 6                | 13        | 57       | 6            | 3 |
| 13753080                             | 8                | 19        | 69       | 10           | 4 |
| 13753090                             | 9                | 19        | 69       | 10           | 4 |
| 13753100                             | 10               | 22        | 72       | 10           | 4 |
| 13753120                             | 12               | 26        | 83       | 12           | 4 |
| 13753140                             | 14               | 26        | 83       | 12           | 4 |
| 13753150                             | 15               | 32        | 92       | 16           | 4 |
| 13753160                             | 16               | 32        | 92       | 16           | 4 |
| 13753180                             | 18               | 32        | 92       | 16           | 4 |
| 13753207                             | 20               | 38        | 104      | 20           | 4 |



**Fresa per sgrossatura lunga, HSS-CoPM, taglio al centro**  
**HSS-CoPM roughing long end mill, center cut**

**Art. 13765** 



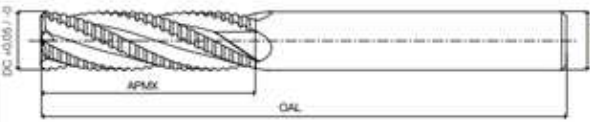
**Descrizione:**

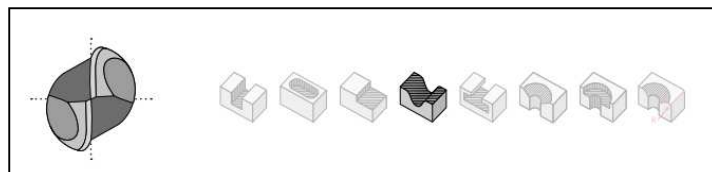
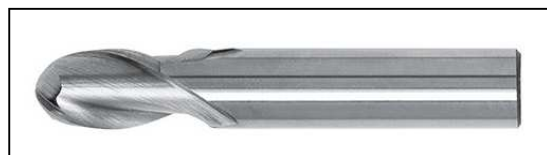
Fresa a sgrossare per contornatura con taglio al centro, materiale HSS-Co8,5% sinterizzato con finitura lucida, UNI 8244, DIN 844A, ISO 1641/I. Profilo del tagliente NR per sgrossatura di materiali medio-legati, serie lunga, gambo cilindrico; gambo Weldon o filettato fornibile su richiesta.

Roughing shouldering end mill with center cut, sintered HSS-Co8,5% with bright finish, UNI 8244, DIN 844A, ISO 1641/I. Cutting edge profile NR for roughing medium-alloy materials, long length, cylindrical shank; Weldon or threaded shank available upon request.



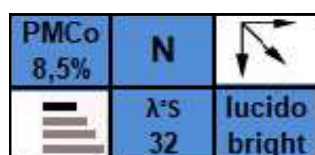
| <b>ART. 13765</b>                    |                  |           |          |              |   |
|--------------------------------------|------------------|-----------|----------|--------------|---|
| <b>Dati tecnici / Technical data</b> |                  |           |          |              |   |
| Cod. Code                            | DC +0,05/-0 [mm] | APMX [mm] | OAL [mm] | DCON h6 [mm] | Z |
| 13765080                             | 8                | 38        | 88       | 10           | 4 |
| 13765100                             | 10               | 45        | 95       | 10           | 4 |
| 13765120                             | 12               | 53        | 110      | 12           | 4 |
| 13765140                             | 14               | 53        | 110      | 12           | 4 |
| 13765160                             | 16               | 63        | 123      | 16           | 4 |
| 13765180                             | 18               | 63        | 123      | 16           | 4 |
| 13765200                             | 20               | 75        | 135      | 16           | 4 |
| 13765207                             | 20               | 75        | 141      | 20           | 4 |



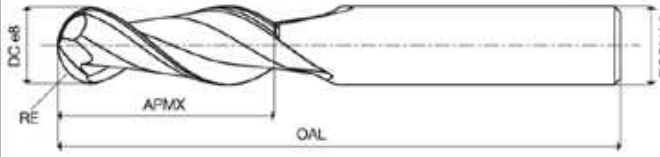
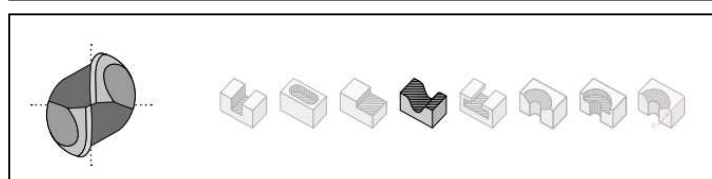
**Fresa a 2 taglienti emisferica extracorta, HSS-CoPM  
HSS-CoPM 2 flute ball-nosed extrashort end mill**
**Art. 13811**

**Descrizione:**

Fresa a 2 taglienti a testa emisferica per copiatura, materiale HSS-Co8,5% sinterizzato con finitura lucida, ISO 1641/I. Profilo del tagliente N per finitura di materiali medio-legati, serie extracorta, gambo cilindrico; gambo Weldon o filettato fornibile su richiesta

2 flute ball-nosed end mill for profiling, sintered HSS-Co8.5% with bright finish, ISO 1641/I. Cutting edge profile N for finishing medium-alloy materials, extra-short length, cylindrical shank; Weldon or threaded shank available upon request.

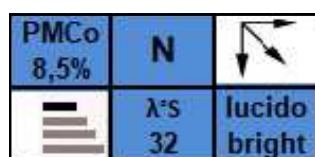


| ART. 13811                    |            |     |           |          |              |   |
|-------------------------------|------------|-----|-----------|----------|--------------|---|
| Dati tecnici / Technical data |            |     |           |          |              |   |
| Cod. Code                     | DC e8 [mm] | RE  | APMX [mm] | OAL [mm] | DCON h6 [mm] | Z |
| 13811020                      | 2          | 1   | 4         | 48       | 6            | 2 |
| 13811030                      | 3          | 1,5 | 5         | 49       | 6            | 2 |
| 13811040                      | 4          | 2   | 7         | 51       | 6            | 2 |
| 13811050                      | 5          | 2,5 | 8         | 52       | 6            | 2 |
| 13811060                      | 6          | 3   | 8         | 52       | 6            | 2 |
| 13811080                      | 8          | 4   | 11        | 61       | 10           | 2 |
| 13811100                      | 10         | 5   | 13        | 63       | 10           | 2 |
| 13811120                      | 12         | 6   | 16        | 73       | 12           | 2 |
| 13811140                      | 14         | 7   | 16        | 73       | 12           | 2 |
| 13811160                      | 16         | 8   | 19        | 79       | 16           | 2 |
| 13811180                      | 18         | 9   | 19        | 79       | 16           | 2 |
| 13811200                      | 20         | 10  | 22        | 88       | 20           | 2 |

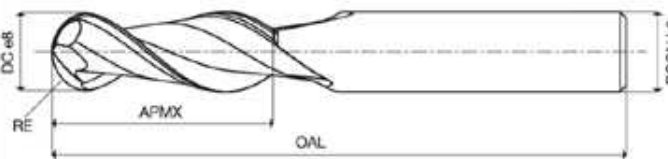

**Fresa a 2 taglienti emisferica extracorta, HSS-CoPM, rivestita  
HSS-CoPM 2 flute ball-nosed extrashort end mill, coated**
**Art. 13814**

**Descrizione:**

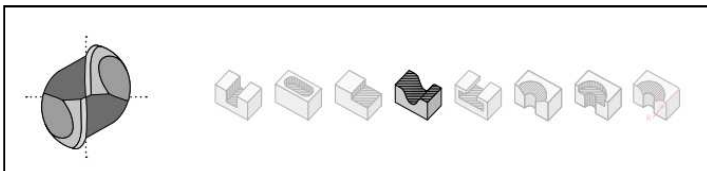
Fresa a 2 taglienti a testa emisferica per copiatura, materiale HSS-Co8,5% sinterizzato con rivestimento multistrato a base Ti e Al per acciai, ghise, inox, titanio, HRSA, ISO 1641/I. Profilo del tagliente N per finitura di materiali medio-legati, serie extracorta, gambo cilindrico; gambo Weldon o filettato fornibile su richiesta.

2 flute ball-nosed end mill for profiling, sintered HSS-Co8.5% with Ti and Al based multi-coating for steel, cast, iron, inox, titanium, HRSA, ISO 1641/I. Cutting edge profile N for finishing medium-alloy materials, extra-short length, cylindrical shank; Weldon or threaded shank available upon request.



| ART. 13814                    |            |     |           |          |              |   |
|-------------------------------|------------|-----|-----------|----------|--------------|---|
| Dati tecnici / Technical data |            |     |           |          |              |   |
| Cod. Code                     | DC e8 [mm] | RE  | APMX [mm] | OAL [mm] | DCON h6 [mm] | Z |
| 13814020                      | 2          | 1   | 4         | 48       | 6            | 2 |
| 13814030                      | 3          | 1,5 | 5         | 49       | 6            | 2 |
| 13814040                      | 4          | 2   | 7         | 51       | 6            | 2 |
| 13814050                      | 5          | 2,5 | 8         | 52       | 6            | 2 |
| 13814060                      | 6          | 3   | 8         | 52       | 6            | 2 |
| 13814080                      | 8          | 4   | 11        | 61       | 10           | 2 |
| 13814100                      | 10         | 5   | 13        | 63       | 10           | 2 |
| 13814120                      | 12         | 6   | 16        | 73       | 12           | 2 |
| 13814140                      | 14         | 7   | 16        | 73       | 12           | 2 |
| 13814160                      | 16         | 8   | 19        | 79       | 16           | 2 |
| 13814180                      | 18         | 9   | 19        | 79       | 16           | 2 |
| 13814200                      | 20         | 10  | 22        | 88       | 20           | 2 |



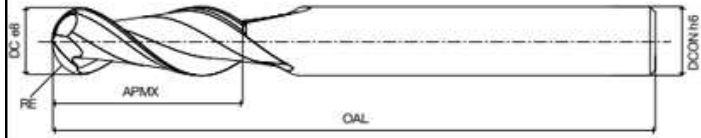
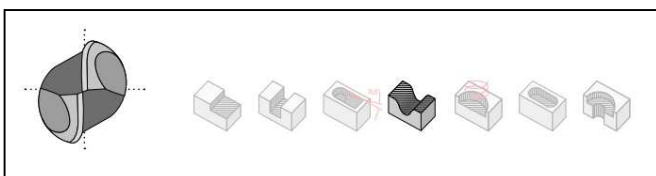
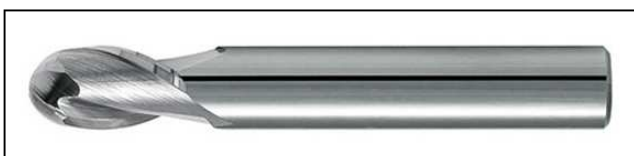
**Fresa a 2 taglienti emisferica lunga, HSS-CoPM**  
**HSS-CoPM 2 flute ball-nosed long end mill**
**Art. 13841** 

**Descrizione:**

Fresa a 2 taglienti a testa emisferica per copiatura, materiale HSS-Co8,5% sinterizzato con finitura lucida. Profilo del tagliente N per finitura di materiali medio-legati, serie lunga, gambo cilindrico; gambo Weldon o filettato fornibile su richiesta.

2 flute ball-nosed end mill for profiling, sintered HSS-Co8.5% with bright finish. Cutting edge profile N for finishing medium-alloy materials, long length, cylindrical shank; Weldon or threaded shank available upon request.

|                                                                                    |           |                                                                                   |
|------------------------------------------------------------------------------------|-----------|-----------------------------------------------------------------------------------|
| PMCo<br>8,5%                                                                       | N         |  |
|  | λ°S<br>32 | lucido<br>bright                                                                  |

| ART. 13841                    |                  |     |              |             |                    |   |
|-------------------------------|------------------|-----|--------------|-------------|--------------------|---|
| Dati tecnici / Technical data |                  |     |              |             |                    |   |
| Cod.<br>Code                  | DC<br>e8<br>[mm] | RE  | APMX<br>[mm] | OAL<br>[mm] | DCON<br>h6<br>[mm] | Z |
| 13841040                      | 4                | 2   | 13           | 67          | 6                  | 2 |
| 13841050                      | 5                | 2,5 | 16           | 70          | 6                  | 2 |
| 13841060                      | 6                | 3   | 16           | 76          | 6                  | 2 |
| 13841080                      | 8                | 4   | 19           | 79          | 10                 | 2 |
| 13841100                      | 10               | 5   | 22           | 83          | 10                 | 2 |
| 13841120                      | 12               | 6   | 28           | 98          | 12                 | 2 |
| 13841140                      | 14               | 7   | 32           | 102         | 12                 | 2 |
| 13841160                      | 16               | 8   | 32           | 108         | 16                 | 2 |
| 13841180                      | 18               | 9   | 35           | 114         | 16                 | 2 |
| 13841200                      | 20               | 10  | 38           | 132         | 20                 | 2 |

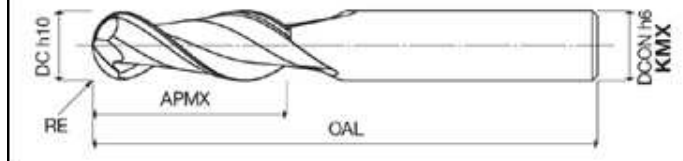

**Fresa a 2 taglienti emisferica corta, HM**  
**HM 2 flute ball-nosed short end mill**
**Art. 13871** 

**Descrizione:**

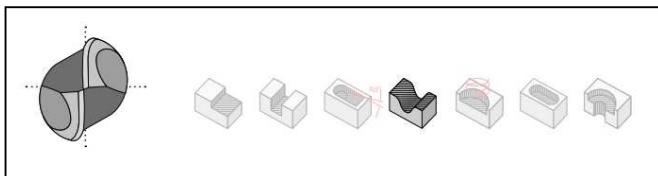
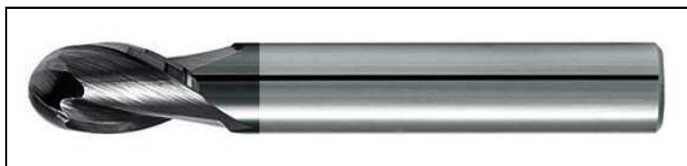
Fresa a 2 taglienti a testa emisferica per sgrossatura, materiale metallo duro HM con finitura lucida. Profilo del tagliente H per lavorazioni di materiali alto-legati, serie corta, gambo cilindrico; gambo Weldon fornibile su richiesta.

2 flute ball-nosed end mill for roughing, solid carbide HM with bright finish. Cutting edge profile H for the machining of high-alloyed materials, short length, cylindrical shank; Weldon shank available upon request.

|                                                                                     |           |                                                                                     |
|-------------------------------------------------------------------------------------|-----------|-------------------------------------------------------------------------------------|
| HM                                                                                  | H         |  |
|  | λ°S<br>32 | lucido<br>bright                                                                    |

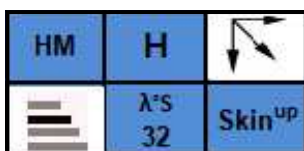
| ART. 13871                    |                   |     |              |             |                    |   |
|-------------------------------|-------------------|-----|--------------|-------------|--------------------|---|
| Dati tecnici / Technical data |                   |     |              |             |                    |   |
| Cod.<br>Code                  | DC<br>h10<br>[mm] | RE  | APMX<br>[mm] | OAL<br>[mm] | DCON<br>h6<br>[mm] | Z |
| 13871020                      | 2                 | 1   | 7            | 40          | 2                  | 2 |
| 13871030                      | 3                 | 1,5 | 8            | 40          | 3                  | 2 |
| 13871040                      | 4                 | 2   | 10           | 50          | 4                  | 2 |
| 13871050                      | 5                 | 2,5 | 12           | 50          | 5                  | 2 |
| 13871060                      | 6                 | 3   | 14           | 57          | 6                  | 2 |
| 13871080                      | 8                 | 4   | 16           | 63          | 8                  | 2 |
| 13871090                      | 9                 | 4,5 | 18           | 67          | 9                  | 2 |
| 13871100                      | 10                | 5   | 20           | 72          | 10                 | 2 |
| 13871120                      | 12                | 6   | 22           | 83          | 12                 | 2 |
| 13871140                      | 14                | 7   | 25           | 83          | 14                 | 2 |
| 13871160                      | 16                | 8   | 32           | 92          | 16                 | 2 |
| 13871180                      | 18                | 9   | 32           | 92          | 18                 | 2 |
| 13871200                      | 20                | 10  | 38           | 104         | 20                 | 2 |



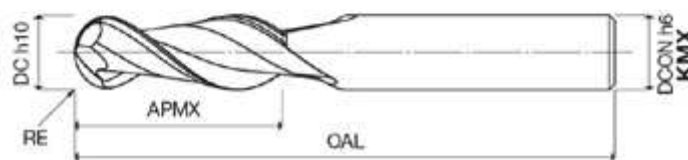
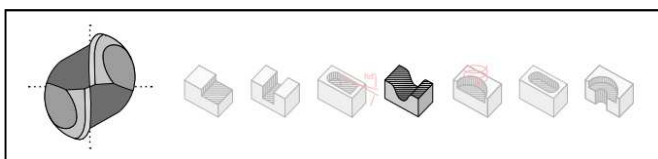
**Fresa a 2 taglienti emisferica corta, HM, rivestita**  
**HM 2 flute ball-nosed short end mill, coated**
**Art. 13874** 

**Descrizione:**

Fresa a 2 taglienti a testa emisferica per sgrossatura, materiale metallo duro HM con rivestimento multistrato a base Ti e Al per tutti i tipi di materiali. Profilo del tagliente H per lavorazioni di materiali alto-legati, serie corta, gambo cilindrico; gambo Weldon fornibile su richiesta.

2 flute ball-nosed end mill for roughing, solid carbide HM with Ti and Al based multi-coating for every kind of materials. Cutting edge profile H for the machining of high-alloyed materials, short length, cylindrical shank; Weldon shank available upon request.


**ART. 13874**
**Dati tecnici / Technical data**

| Cod. Code | DC h10 [mm] | RE  | APMX [mm] | OAL [mm] | DCON h6 [mm] | Z |
|-----------|-------------|-----|-----------|----------|--------------|---|
| 13874020  | 2           | 1   | 7         | 40       | 2            | 2 |
| 13874030  | 3           | 1,5 | 8         | 40       | 3            | 2 |
| 13874040  | 4           | 2   | 10        | 50       | 4            | 2 |
| 13874050  | 5           | 2,5 | 12        | 50       | 5            | 2 |
| 13874060  | 6           | 3   | 14        | 57       | 6            | 2 |
| 13874080  | 8           | 4   | 16        | 63       | 8            | 2 |
| 13874100  | 10          | 5   | 20        | 72       | 10           | 2 |
| 13874120  | 12          | 6   | 22        | 83       | 12           | 2 |

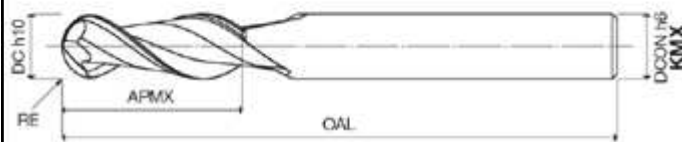

**Fresa a 2 taglienti emisferica lunga, HM**  
**HM 2 flute ball-nosed long end mill**
**Art. 13878** 

**Descrizione:**

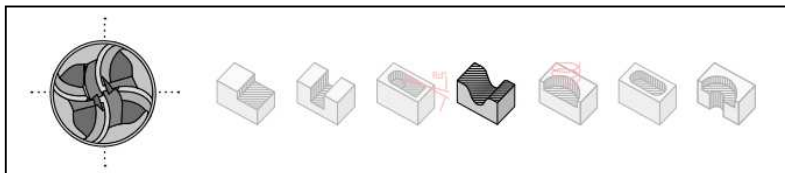
Fresa a 2 taglienti a testa emisferica per sgrossatura, materiale metallo duro HM con finitura lucida. Profilo del tagliente H per lavorazioni di materiali alto-legati, serie lunga, gambo cilindrico; gambo Weldon fornibile su richiesta.

2 flute ball-nosed end mill for roughing, solid carbide HM with bright finish. Cutting edge profile H for the machining of high-alloyed materials, long length, cylindrical shank; Weldon shank available upon request.


**ART. 13878**
**Dati tecnici / Technical data**

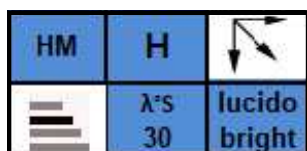
| Cod. Code | DC h10 [mm] | RE | APMX [mm] | OAL [mm] | DCON h6 [mm] | Z |
|-----------|-------------|----|-----------|----------|--------------|---|
| 13878040  | 4           | 2  | 20        | 60       | 4            | 2 |
| 13878060  | 6           | 3  | 24        | 65       | 6            | 2 |
| 13878080  | 8           | 4  | 32        | 80       | 8            | 2 |
| 13878100  | 10          | 5  | 32        | 80       | 10           | 2 |



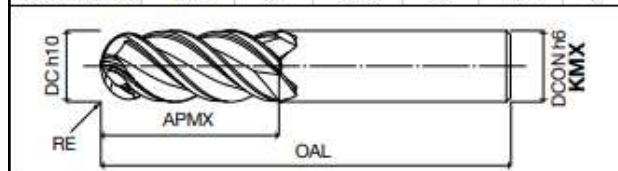
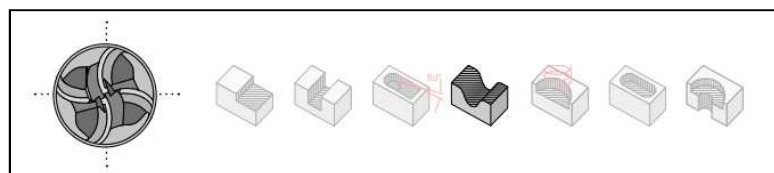
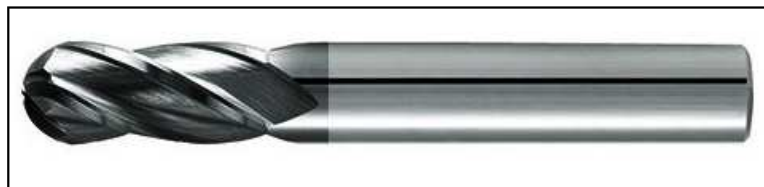
**Fresa a 4 taglienti emisferica corta, HM  
HM 4 flute ball-nosed short end mill**
**Art. 13881** 

**Descrizione:**

Fresa a 4 taglienti a testa emisferica per sgrossatura, materiale metallo duro HM con finitura lucida. Profilo del tagliente H per lavorazioni di materiali alto-legati, serie corta, gambo cilindrico; gambo Weldon fornibile su richiesta.

4 flute ball-nosed end mill for roughing, solid carbide HM with bright finish. Cutting edge profile H for the machining of high-alloyed materials, short length, cylindrical shank; Weldon shank available upon request.


**ART. 13881**
**Dati tecnici / Technical data**

| Cod. Code | DC h10 [mm] | RE  | APMX [mm] | OAL [mm] | DCON h6 [mm] | Z |
|-----------|-------------|-----|-----------|----------|--------------|---|
| 13881020  | 2           | 1   | 7         | 40       | 2            | 4 |
| 13881030  | 3           | 1,5 | 10        | 40       | 3            | 4 |
| 13881040  | 4           | 2   | 11        | 50       | 4            | 4 |
| 13881050  | 5           | 2,5 | 13        | 50       | 5            | 4 |
| 13881060  | 6           | 3   | 16        | 57       | 6            | 4 |
| 13881070  | 7           | 3,5 | 16        | 60       | 7            | 4 |
| 13881080  | 8           | 4   | 19        | 63       | 8            | 4 |
| 13881090  | 9           | 4,5 | 19        | 67       | 9            | 4 |
| 13881100  | 10          | 5   | 22        | 72       | 10           | 4 |
| 13881110  | 11          | 5,5 | 22        | 83       | 11           | 4 |
| 13881120  | 12          | 6   | 26        | 83       | 12           | 4 |
| 13881140  | 14          | 7   | 28        | 83       | 14           | 4 |

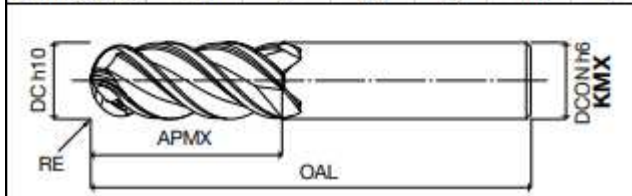

**Fresa a 4 taglienti emisferica corta, HM, rivestita  
HM 4 flute ball-nosed short end mill, coated**
**Art. 13884** 

**Descrizione:**

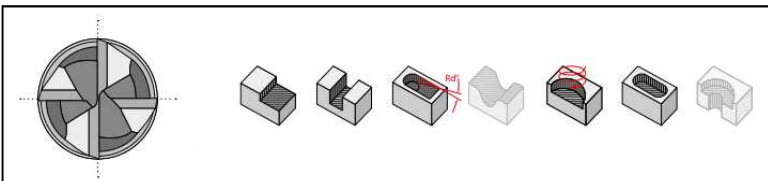
Fresa a 4 taglienti a testa emisferica per sgrossatura, materiale metallo duro HM con rivestimento multistrato a base Ti e Al per tutti i tipi di materiali. Profilo del tagliente H per lavorazioni di materiali alto-legati, serie corta, gambo cilindrico; gambo Weldon fornibile su richiesta.

4 flute ball-nosed end mill for roughing, solid carbide HM with Ti and Al based multi-coating for every kind of materials. Cutting edge profile H for the machining of high-alloyed materials, short length, cylindrical shank; Weldon shank available upon request.


**ART. 13884**
**Dati tecnici / Technical data**

| Cod. Code | DC h10 [mm] | RE  | APMX [mm] | OAL [mm] | DCON h6 [mm] | Z |
|-----------|-------------|-----|-----------|----------|--------------|---|
| 13884030  | 3           | 1,5 | 10        | 40       | 3            | 4 |
| 13884040  | 4           | 2   | 11        | 50       | 4            | 4 |
| 13884050  | 5           | 2,5 | 13        | 50       | 5            | 4 |
| 13884060  | 6           | 3   | 16        | 57       | 6            | 4 |
| 13884080  | 8           | 4   | 19        | 63       | 8            | 4 |
| 13884100  | 10          | 5   | 22        | 72       | 10           | 4 |

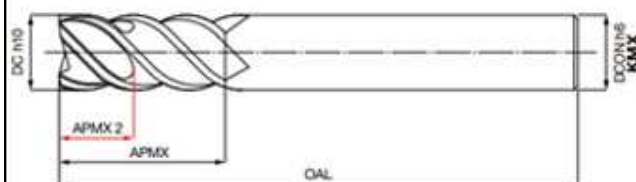


**Fresa a 4 taglienti corta, HM HSC, rivestita  
HM HSC 4 flute short end mill, coated**
**Art. 13955** 

**Descrizione:**

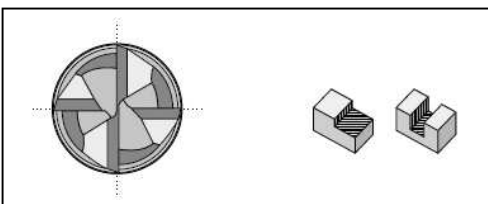
Fresa a 4 taglienti per apertura cava e contornatura, materiale metallo duro HM HSC per alta velocità di taglio, con rivestimento multistrato a base Ti e Al per fresatura di materiali duri e tenaci; UNI DIN ISO 6527. Profilo del tagliente H per lavorazioni di materiali alto-legati, geometria Double Action ideale per materiali temprati; serie corta, gambo cilindrico, gambo Weldon fornibile su richiesta.

4 flute end mill for slotting and shouldering, solid carbide HM HSC (High Speed Cutting) with Ti and Al based multi-coating for milling of hard and tough materials; UNI DIN ISO 6527. Cutting edge profile H for the machining of high-alloyed materials, geometry Double Action suitable for hardened materials; short length, cylindrical shank; Weldon shank available upon request.

| <b>ART. 13955</b>                    |             |            |           |          |              |   |
|--------------------------------------|-------------|------------|-----------|----------|--------------|---|
| <b>Dati tecnici / Technical data</b> |             |            |           |          |              |   |
| Cod. Code                            | DC h10 [mm] | APMX2 [mm] | APMX [mm] | OAL [mm] | DCON h6 [mm] | Z |
| 13955040                             | 4           | 6          | 11        | 57       | 6            | 4 |
| 13955050                             | 5           | 7          | 13        | 57       | 6            | 4 |
| 13955060                             | 6           | 7          | 13        | 57       | 6            | 4 |
| 13955080                             | 8           | 10         | 19        | 63       | 8            | 4 |



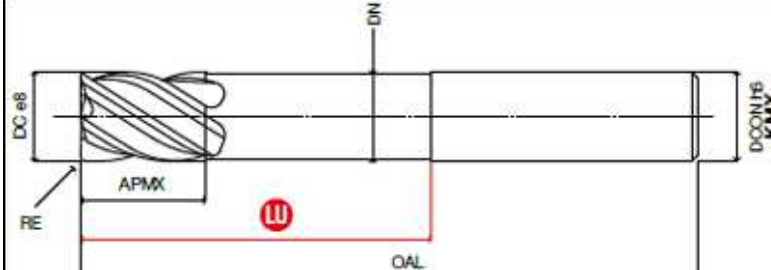
|                                                                                     |        |                                                                                     |
|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|
| HM HSC                                                                              | H      |  |
|  | λ's 50 | Skin <sup>3</sup>                                                                   |

**Fresa torica a 4 taglienti lunga, HM HSC, rivestita  
HM HSC 4 flute toric long end mill, coated**
**Art. 13960** 

**Descrizione:**

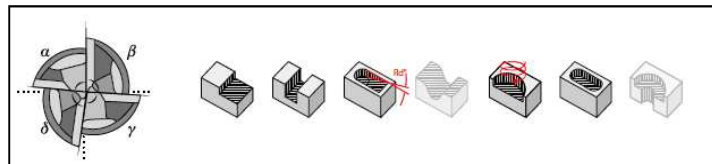
Fresa torica a 4 taglienti per apertura cava e contornatura, materiale metallo duro HM HSC per alta velocità di taglio, con rivestimento multistrato a base Ti e Al per fresatura di materiali duri e tenaci. Profilo del tagliente H per lavorazioni di materiali alto-legati, serie lunga e extralunga; gambo cilindrico, gambo Weldon fornibile su richiesta.

4 flute toric end mill for slotting and shouldering, solid carbide HM HSC (High Speed Cutting) with Ti and Al based multi-coating for milling of hard and tough materials. Cutting edge profile H for the machining of high-alloyed materials; long and extra-long length, cylindrical shank; Weldon shank available upon request.

| <b>ART. 13960</b>                    |            |     |           |         |         |          |              |   |
|--------------------------------------|------------|-----|-----------|---------|---------|----------|--------------|---|
| <b>Dati tecnici / Technical data</b> |            |     |           |         |         |          |              |   |
| Cod. Code                            | DC e8 [mm] | RE  | APMX [mm] | DN [mm] | LU [mm] | OAL [mm] | DCON h6 [mm] | Z |
| 13960030                             | 3          | 0,5 | 4         | 2,8     | 9       | 57       | 6            | 4 |
| 13960040                             | 4          | 0,5 | 5         | 3,7     | 12      | 57       | 6            | 4 |
| 13960050                             | 5          | 0,5 | 6         | 4,6     | 15      | 57       | 6            | 4 |
| 13960060                             | 6          | 1   | 7         | 5,5     | 20      | 57       | 6            | 4 |
| 13960061                             | 6          | 1   | 7         | 5,5     | 33      | 70       | 6            | 4 |
| 13960080                             | 8          | 1   | 9         | 7,4     | 26      | 63       | 8            | 4 |
| 13960081                             | 8          | 1   | 9         | 7,4     | 43      | 80       | 8            | 4 |
| 13960100                             | 10         | 1,5 | 11        | 9,2     | 31      | 72       | 10           | 4 |



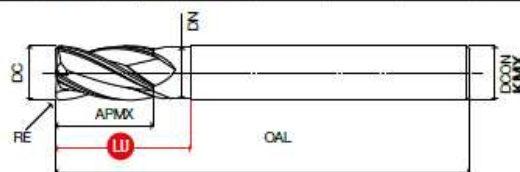
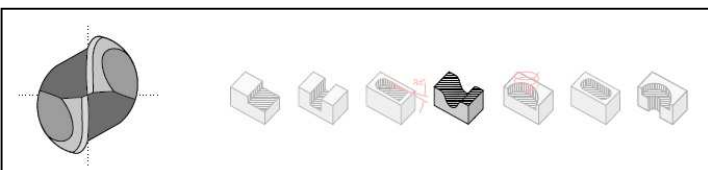
|                                                                                    |        |                                                                                     |
|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|
| HM HSC                                                                             | H      |  |
|  | λ's 25 | Skin <sup>3</sup>                                                                   |

**Fresa torica a 4 taglienti corta, HM, rivestita  
HM 4 flute toric short end mill, coated**
**Art. 13970** 

**Descrizione:**

Fresa torica a 4 taglienti per apertura cava e contornatura, materiale metallo duro HM con rivestimento multistrato a base Ti e Al per tutti i tipi di materiali. Profilo del tagliente H per lavorazioni di materiali alto-legati, geometria a divisione irregolare, dal diametro mm 8 in poi eliche differenziate 30°/32° per la lavorazione di una vasta gamma di materiali; serie corta, gambo cilindrico, gambo Weldon fornibile su richiesta.

4 flute toric end mill for slotting and shouldering, solid carbide HM with Ti and Al based multi-coating for every kind of materials. Cutting edge profile H for the machining of high-alloyed materials, geometry with irregular division, from diameter mm 8 up different helices 30°/32° for machining a wide range of materials; short length, cylindrical shank; Weldon shank available upon request.

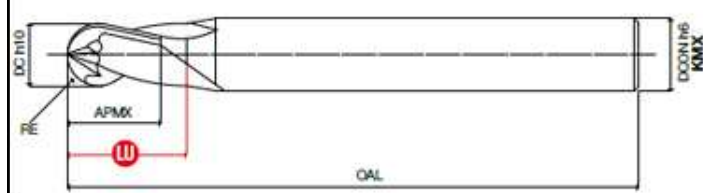
| ART. 13970                    |             |     |           |         |          |         |              |   |
|-------------------------------|-------------|-----|-----------|---------|----------|---------|--------------|---|
| Dati tecnici / Technical data |             |     |           |         |          |         |              |   |
| cod. code                     | DC h10 [mm] | RE  | APMX [mm] | DN [mm] | OAL [mm] | LU [mm] | DCON h6 [mm] | Z |
| 13970020                      | 2           | 0,2 | 7         | 1,9     | 40       | 11      | 2            | 4 |
| 13970030                      | 3           | 0,3 | 10        | 2,8     | 40       | 13      | 3            | 4 |
| 13970040                      | 4           | 0,5 | 11        | 3,7     | 50       | 16      | 4            | 4 |
| 13970050                      | 5           | 0,5 | 13        | 4,6     | 50       | 16      | 5            | 4 |
| 13970060                      | 6           | 0,5 | 16        | 5,5     | 57       | 20      | 6            | 4 |
| 13970080                      | 8           | 1,0 | 19        | 7,4     | 63       | 23      | 8            | 4 |
| 13970100                      | 10          | 1,0 | 22        | 9,2     | 72       | 28      | 10           | 4 |
| 13970120                      | 12          | 1,0 | 26        | 11      | 83       | 32      | 12           | 4 |


**Fresa a 2 taglienti emisferica corta, HM HSC, rivestita  
HM HSC 2 flute ball-nosed short end mill, coated**
**Art. 14070** 

**Descrizione:**

Fresa a 2 taglienti a testa emisferica per finitura e semifinitura, materiale metallo duro HM HSC per alta velocità di taglio, con rivestimento multistrato a base Ti e Al per fresatura di materiali duri e tenaci, particolarmente adatta per la lavorazione di acciai temprati. Profilo del tagliente H per lavorazioni di materiali alto-legati, serie corta; gambo cilindrico.

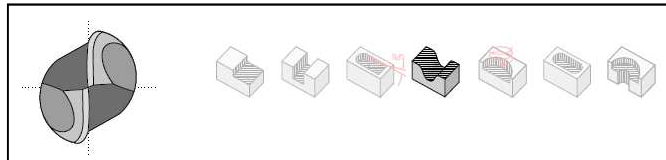
2 flute ball-nosed end mill for finishing and semi-finishing, solid carbide HM HSC (High Speed Cutting) with Ti and Al based multi-coating for milling of hard and tough materials, particularly suitable for the processing of hardened steels. Cutting edge profile H for the machining of high-alloyed materials; short length, cylindrical shank.

| ART. 14070                    |             |     |           |         |          |              |   |
|-------------------------------|-------------|-----|-----------|---------|----------|--------------|---|
| Dati tecnici / Technical data |             |     |           |         |          |              |   |
| cod. code                     | DC h10 [mm] | RE  | APMX [mm] | LU [mm] | OAL [mm] | DCON h6 [mm] | Z |
| 14070020                      | 2           | 1   | 3         | 4       | 50       | 6            | 2 |
| 14070030                      | 3           | 1,5 | 5         | 7       | 60       | 6            | 2 |
| 14070040                      | 4           | 2   | 6         | 8       | 70       | 6            | 2 |
| 14070050                      | 5           | 2,5 | 8         | 10      | 80       | 6            | 2 |
| 14070060                      | 6           | 3   | 9         | -       | 90       | 6            | 2 |
| 14070080                      | 8           | 4   | 12        | -       | 100      | 8            | 2 |
| 14070100                      | 10          | 5   | 15        | -       | 100      | 10           | 2 |



**Fresa a 2 taglienti emisferica extralunga, HM HSC, rivestita  
HM HSC 2 flute ball-nosed extra-long end mill, coated**

**Art. 14080** 



**Descrizione:**

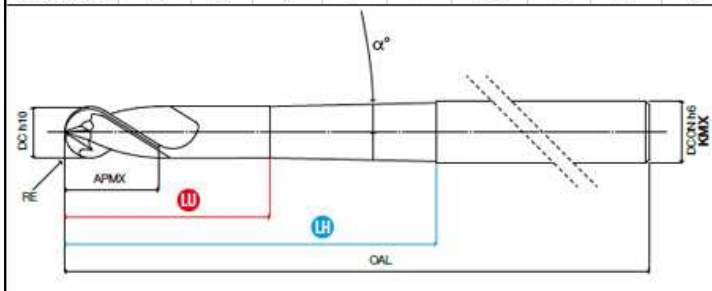
Fresa a 2 taglienti a testa emisferica per finitura e semifinitura, materiale metallo duro HM HSC per alta velocità di taglio, con rivestimento multistrato a base Ti e Al per fresatura di materiali duri e tenaci, adatta per la lavorazione di acciai temprati. Profilo del tagliente H per lavorazioni di materiali alto-legati, serie extralunga; gambo cilindrico.

2 flute ball-nosed end mill for finishing and semi-finishing, solid carbide HM HSC (High Speed Cutting) with Ti and Al based multi-coating for milling of hard and tough materials, suitable for the processing of hardened steels. Cutting edge profile H for the machining of high-alloyed materials; extra-long length, cylindrical shank.

**ART. 14080**

**Dati tecnici / Technical data**

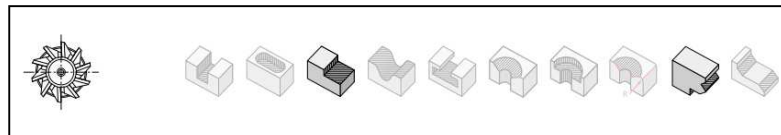
| cod. code | DC h10 [mm] | RE  | APMX [mm] | LU [mm] | LH [mm] | OAL [mm] | $\alpha^\circ$ | DCON h6 [mm] | Z |
|-----------|-------------|-----|-----------|---------|---------|----------|----------------|--------------|---|
| 14080020  | 2           | 1   | 3         | 8       | 40      | 80       | 1°30           | 6            | 2 |
| 14080030  | 3           | 1,5 | 4         | 12      | 40      | 80       | 1°30           | 6            | 2 |
| 14080040  | 4           | 2   | 5         | 16      | 40      | 80       | 1°30           | 6            | 2 |
| 14080050  | 5           | 2,5 | 6         | 20      | 40      | 80       | 1°             | 6            | 2 |
| 14080060  | 6           | 3   | 6         | -       | -       | 80       | -              | 6            | 2 |
| 14080080  | 8           | 4   | 7         | -       | -       | 100      | -              | 8            | 2 |



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**IL RISPARMIO DI TEMPO  
E DI COSTI**

**PER LE TUE SOLUZIONI DI LAVORO**

**Fresa ad angolo divergente, HSS-Co  
HSS-Co dovetail cutter**

**Descrizione:**

Fresa ad angolo divergente per fresatura di forma, materiale HSS-Co5% con finitura lucida, UNI 8262A, DIN 1833A, ISO 3959. Profilo del tagliente N per finitura di materiali medio-legati, gambo cilindrico; gambo Weldon o filettato fornibile su richiesta. Questa fresa è adatta a lavorare in cava già esistente, non è adatta per apertura cava.

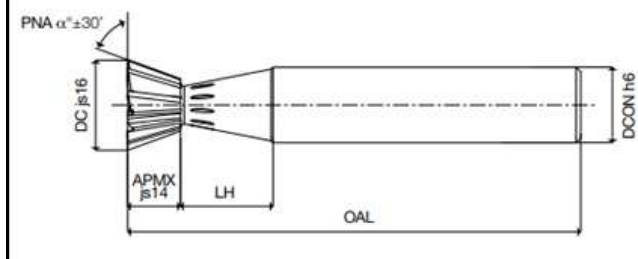
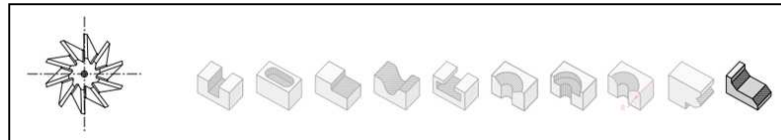
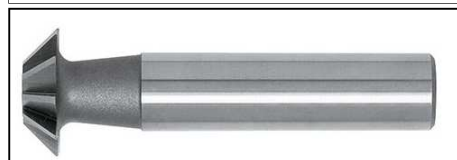
Dovetail cutter for form milling, HSS-Co5% with bright finish, UNI 8262A, DIN 1833A, ISO 3959. Cutting edge profile N for finishing medium-alloy materials, cylindrical shank; Weldon or threaded shank available upon request. End mill suitable to work in existing slot, not suitable for slotting.

|             |   |                                                                                   |
|-------------|---|-----------------------------------------------------------------------------------|
| HSS<br>Co5% | N |  |
|             |   | lucido<br>bright                                                                  |

**Art. 14320**

**ART. 14320**
**Dati tecnici / Technical data**

| Cod.<br>Code | DC<br>js16<br>[mm] | PNA<br>$\alpha \pm 30^\circ$<br>[mm] | APMX<br>js14<br>[mm] | LH<br>[mm] | OAL<br>[mm] | DCON<br>h6<br>[mm] | Z  |
|--------------|--------------------|--------------------------------------|----------------------|------------|-------------|--------------------|----|
| 14320080     | 16                 | 45                                   | 4                    | 11,3       | 60          | 12                 | 10 |
| 14320100     | 20                 | 45                                   | 5                    | 13,5       | 63          | 12                 | 10 |
| 14320115     | 25                 | 45                                   | 6,3                  | 13         | 67          | 12                 | 10 |
| 14320130     | 32                 | 45                                   | 8                    | 14         | 71          | 16                 | 12 |
| 14320145     | 16                 | 60                                   | 6,3                  | 11         | 60          | 12                 | 10 |
| 14320160     | 20                 | 60                                   | 8                    | 10         | 63          | 12                 | 10 |
| 14320175     | 25                 | 60                                   | 10                   | 11,5       | 67          | 12                 | 10 |
| 14320185     | 32                 | 60                                   | 12,5                 | 12,5       | 71          | 16                 | 12 |


**Fresa ad angolo convergente, HSS-Co  
HSS-Co inverted dovetail cutter**

**Descrizione:**

Fresa ad angolo divergente per fresatura di forma, materiale HSS-Co5% con finitura lucida, UNI 8262B, DIN 1833B, ISO 3959. Profilo del tagliente N per finitura di materiali medio-legati, gambo cilindrico; gambo Weldon o filettato fornibile su richiesta.

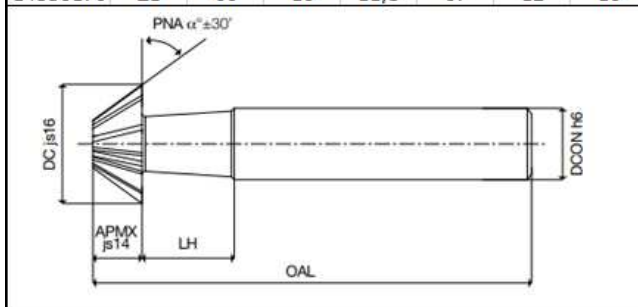
Inverted dovetail cutter for form milling, HSS-Co5% with bright finish, UNI 8262B, DIN 1833B, ISO 3959. Cutting edge profile N for finishing medium-alloy materials, cylindrical shank; Weldon or threaded shank available upon request.

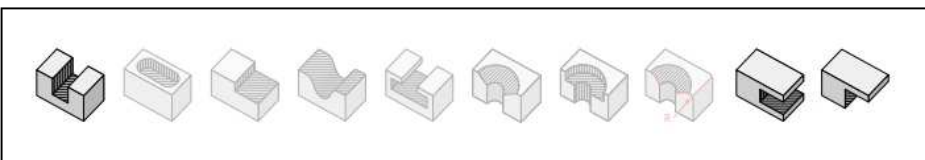
|             |   |                                                                                     |
|-------------|---|-------------------------------------------------------------------------------------|
| HSS<br>Co5% | N |  |
|             |   | lucido<br>bright                                                                    |

**Art. 14330**

**ART. 14330**
**Dati tecnici / Technical data**

| Cod.<br>Code | DC<br>js16<br>[mm] | PNA<br>$\alpha \pm 30^\circ$<br>[mm] | APMX<br>js14<br>[mm] | LH<br>[mm] | OAL<br>[mm] | DCON<br>h6<br>[mm] | Z  |
|--------------|--------------------|--------------------------------------|----------------------|------------|-------------|--------------------|----|
| 14330080     | 16                 | 45                                   | 4                    | 11,3       | 60          | 12                 | 10 |
| 14330095     | 20                 | 45                                   | 5                    | 13,5       | 63          | 12                 | 10 |
| 14330110     | 25                 | 45                                   | 6,3                  | 13         | 67          | 12                 | 10 |
| 14330125     | 32                 | 45                                   | 8                    | 14         | 71          | 16                 | 12 |
| 14330140     | 16                 | 60                                   | 6,3                  | 11         | 60          | 12                 | 10 |
| 14330155     | 20                 | 60                                   | 8                    | 10         | 63          | 12                 | 10 |
| 14330170     | 25                 | 60                                   | 10                   | 11,5       | 67          | 12                 | 10 |



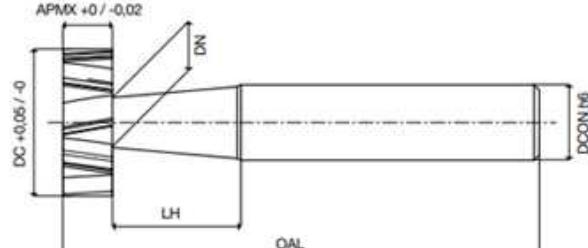
**Fresa per scanalature Woodruff, HSS-Co**  
**HSS-Co Woodruff keyseat cutter**
**Art. 14350** 

**Descrizione:**

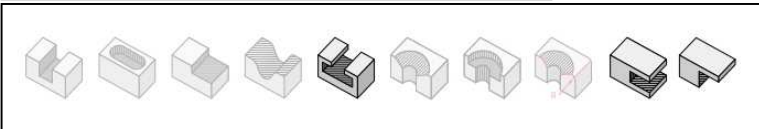
Fresa per sedi di linguette americane Woodruff per incavatura laterale, materiale HSS-Co5% con finitura lucida, UNI 8263, DIN ISO 850B. Profilo del tagliente H per lavorazioni di materiali alto-legati; gambo Weldon o filettato fornibile su richiesta.

Woodruff keyseat cutter for side slotting, HSS-Co5% with bright finish UNI 8263, DIN ISO 850B. Cutting edge profile H for the machining of high-alloyed materials; cylindrical shank; Weldon or threaded shank available upon request.

|             |   |                                                                                   |
|-------------|---|-----------------------------------------------------------------------------------|
| HSS<br>Co5% | N |  |
| -           | - | lucido<br>bright                                                                  |

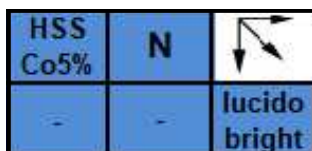
| ART. 14350                    |                        |                          |            |            |             |                    |    |    |
|-------------------------------|------------------------|--------------------------|------------|------------|-------------|--------------------|----|----|
| Dati tecnici / Technical data |                        |                          |            |            |             |                    |    |    |
| Cod.<br>Code                  | DC<br>+0,05/-0<br>[mm] | APMX<br>+0/-0,02<br>[mm] | DN<br>[mm] | LH<br>[mm] | OAL<br>[mm] | DCON<br>h6<br>[mm] | λ° | Z  |
| 14350080                      | 10,5                   | 2                        | 4          | 9          | 50          | 6                  | 13 | 8  |
| 14350095                      | 10,5                   | 3                        | 4,2        | 8          | 50          | 6                  | 13 | 8  |
| 14350110                      | 13,5                   | 2                        | 4,6        | 12         | 56          | 10                 | 15 | 8  |
| 14350125                      | 13,5                   | 3                        | 4,6        | 12         | 56          | 10                 | 15 | 8  |
| 14350140                      | 13,5                   | 4                        | 4,6        | 12         | 56          | 10                 | 15 | 8  |
| 14350155                      | 16,5                   | 3                        | 4,6        | 12         | 56          | 10                 | 15 | 8  |
| 14350170                      | 16,5                   | 4                        | 4,6        | 12         | 56          | 10                 | 15 | 8  |
| 14350185                      | 16,5                   | 5                        | 5          | 9,5        | 56          | 10                 | 15 | 8  |
| 14350200                      | 19,5                   | 3                        | 5,6        | 17,5       | 63          | 10                 | 15 | 10 |
| 14350215                      | 19,5                   | 4                        | 5,6        | 17,5       | 63          | 10                 | 15 | 10 |
| 14350230                      | 19,5                   | 5                        | 6          | 16         | 63          | 10                 | 15 | 10 |
| 14350245                      | 19,5                   | 6                        | 6,5        | 15         | 63          | 10                 | 15 | 10 |
| 14350260                      | 22,5                   | 4                        | 6          | 17         | 63          | 10                 | 13 | 10 |
| 14350275                      | 22,5                   | 5                        | 6          | 17         | 63          | 10                 | 13 | 10 |
| 14350290                      | 22,5                   | 6                        | 6,5        | 13         | 63          | 10                 | 13 | 10 |
| 14350305                      | 22,5                   | 8                        | 6,5        | 13         | 63          | 10                 | 13 | 10 |
| 14350320                      | 25,5                   | 5                        | 7,5        | 12         | 63          | 10                 | 15 | 12 |
| 14350335                      | 25,5                   | 6                        | 7,5        | 12         | 63          | 10                 | 15 | 12 |
| 14350350                      | 28,5                   | 6                        | 8,5        | 10         | 63          | 10                 | 13 | 12 |
| 14350365                      | 28,5                   | 8                        | 8,5        | 10         | 63          | 10                 | 13 | 12 |
| 14350380                      | 28,5                   | 10                       | 9,3        | 13         | 71          | 12                 | 13 | 12 |
| 14350395                      | 32,5                   | 6                        | 8,5        | 16         | 71          | 12                 | 15 | 12 |
| 14350410                      | 32,5                   | 7                        | 8,5        | 16         | 71          | 12                 | 15 | 12 |
| 14350425                      | 32,5                   | 8                        | 8,5        | 16         | 71          | 12                 | 15 | 12 |
| 14350440                      | 32,5                   | 10                       | 9,3        | 13         | 71          | 12                 | 15 | 12 |
| 14350455                      | 45,5                   | 10                       | 11         | 13         | 71          | 12                 | 13 | 12 |

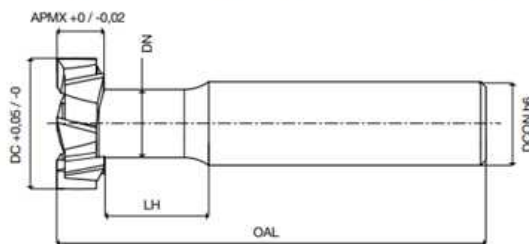
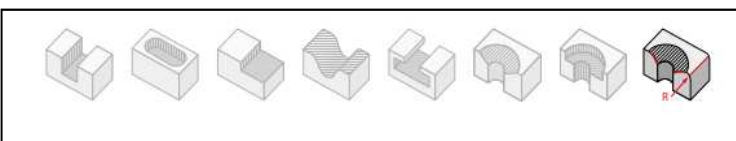
**Fresa per scanalature a T, HSS-Co  
HSS-Co T slot cutter**

**Descrizione:**

Fresa per apertura cava per scanalature a T, materiale HSS-Co5% con finitura lucida, UNI 7339A, DIN 851, ISO 3337. Profilo del tagliente N per finitura di materiali medio-legati, gambo cilindrico; gambo Weldon o filettato fornibile su richiesta.

T slot cutter, HSS-Co5% with bright finish, UNI 7339A, DIN 851, ISO 3337. Cutting edge profile N for finishing medium-alloy materials, cylindrical shank; Weldon or threaded shank available upon request.

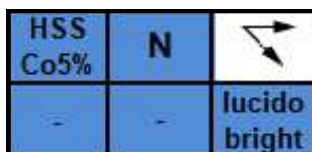

**Art. 14360** 

| ART. 14360                    |                  |                    |         |         |          |              |    |   |
|-------------------------------|------------------|--------------------|---------|---------|----------|--------------|----|---|
| Dati tecnici / Technical data |                  |                    |         |         |          |              |    |   |
| Cod. Code                     | DC +0,05/-0 [mm] | APMX +0/-0,02 [mm] | DN [mm] | LH [mm] | OAL [mm] | DCON h6 [mm] | λ° | Z |
| 14360080                      | 12,5             | 6                  | 5       | 11      | 57       | 10           | 12 | 6 |
| 14360095                      | 16               | 8                  | 7       | 14      | 62       | 10           | 12 | 6 |
| 14360110                      | 18               | 8                  | 8       | 15      | 70       | 12           | 15 | 6 |
| 14360125                      | 21               | 9                  | 10      | 18      | 74       | 12           | 15 | 8 |
| 14360140                      | 25               | 11                 | 12      | 20      | 82       | 16           | 15 | 8 |
| 14360155                      | 32               | 14                 | 15      | 25      | 90       | 16           | 15 | 8 |

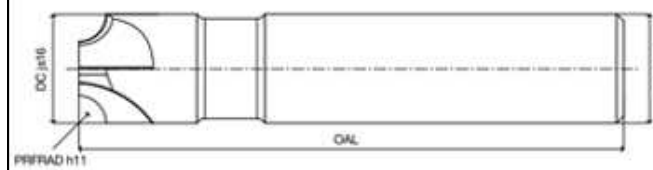

**Fresa ad un quarto di cerchio concavo, HSS-Co  
HSS-Co corner-rounding cutter**

**Descrizione:**

Fresa ad un quarto di cerchio concavo per raccordatura, materiale HSS-Co5% con finitura lucida, UNI 8264, DIN ISO 6518A. Profilo del tagliente N per finitura di materiali medio-legati, gambo cilindrico; gambo Weldon o filettato fornibile su richiesta.

Corner-rounding cutter, HSS-Co5% with bright finish, UNI 8264, DIN ISO 6518A. Cutting edge profile N for finishing medium-alloy materials, cylindrical shank; Weldon or threaded shank available upon request.

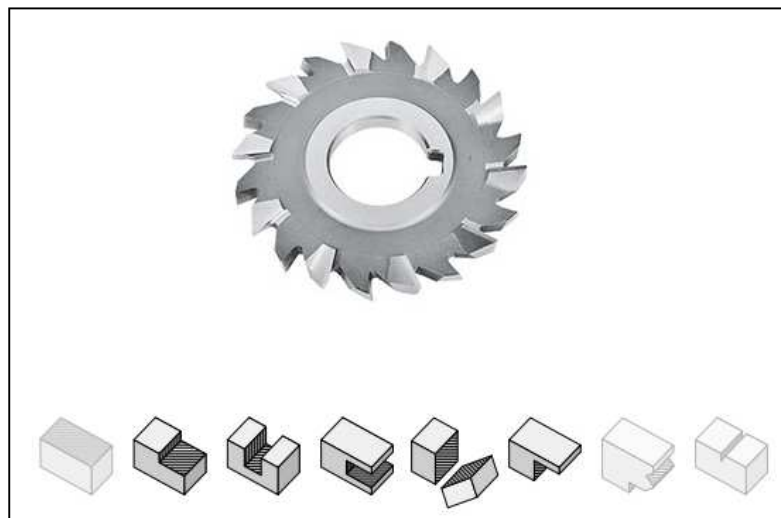

**Art. 14370** 

| ART. 14370                    |                 |              |          |             |   |
|-------------------------------|-----------------|--------------|----------|-------------|---|
| Dati tecnici / Technical data |                 |              |          |             |   |
| Cod. Code                     | PRFRAD h11 [mm] | DC js16 [mm] | OAL [mm] | DMM h6 [mm] | Z |
| 14370010                      | 1               | 10           | 60       | 10          | 4 |
| 14370015                      | 1,5             | 10           | 60       | 10          | 4 |
| 14370020                      | 2               | 10           | 60       | 10          | 4 |
| 14370025                      | 2,5             | 10           | 60       | 10          | 4 |
| 14370030                      | 3               | 12           | 60       | 12          | 4 |
| 14370040                      | 4               | 15           | 60       | 12          | 4 |
| 14370050                      | 5               | 18           | 70       | 16          | 4 |
| 14370060                      | 6               | 21           | 70       | 16          | 4 |
| 14370070                      | 7               | 24           | 70       | 16          | 4 |
| 14370080                      | 8               | 24           | 70       | 16          | 4 |
| 14370090                      | 9               | 28           | 85       | 20          | 4 |
| 14370100                      | 10              | 28           | 85       | 20          | 4 |
| 14370120                      | 12              | 35           | 100      | 20          | 4 |
| 14370125                      | 12,5            | 35           | 100      | 20          | 4 |
| 14370140                      | 14              | 42           | 100      | 25          | 4 |
| 14370150                      | 15              | 48           | 105      | 25          | 5 |
| 14370160                      | 16              | 48           | 105      | 25          | 5 |



**Fresa a 3 tagli a denti elicoidali alternati, HSS-Co  
HSS-Co staggered-toothed side and face cutter**

**Art. 14430**



**Descrizione:**

Fresa a disco 3 tagli a denti elicoidali alternati per cava, acciaio HSS-Co5% oppure PMCo8,5% a seconda della disponibilità di magazzino, UNI 3905A, DIN 885A, ISO 2587. Profilo del tagliente H per lavorazioni di materiali alto-legati.

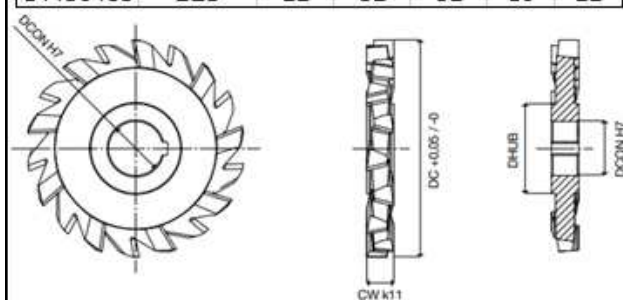
Side and face milling cutter with staggered teeth for slotting, HSS-Co5% or PMCo8,5% steel depending on stock availability, UNI 3905A, DIN 885A, ISO 2587. Cutting edge profile H for the machining of high-alloyed materials.

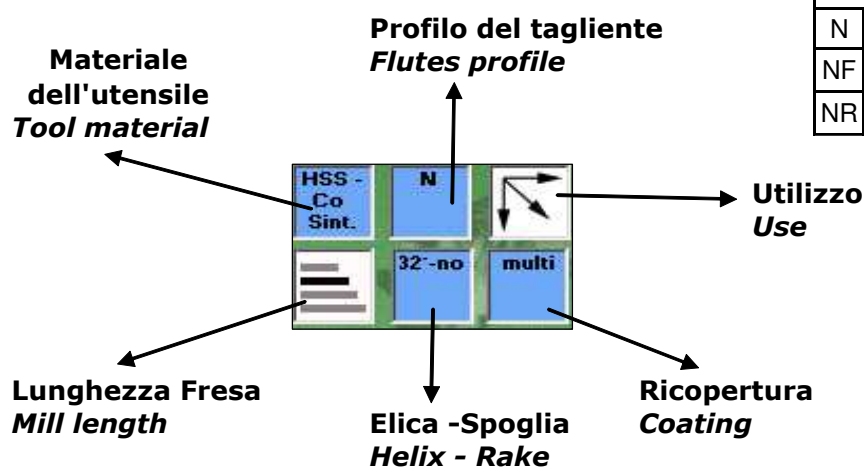
|                                                                                     |                                                                                     |                                                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| HSS<br>Co5%                                                                         | H                                                                                   |  |
|  |  | lucido<br>bright                                                                    |

**ART. 14430**

**Dati tecnici / Technical data**

| Cod.<br>code | DC<br>+0,05/-0<br>[mm] | CW<br>k11<br>[mm] | DHUB<br>[mm] | DCON<br>h7<br>[mm] | $\lambda^\circ$ s | Z  |
|--------------|------------------------|-------------------|--------------|--------------------|-------------------|----|
| 14430080     | 50                     | 4                 | 26           | 16                 | 20                | 16 |
| 14430095     | 50                     | 6                 | 26           | 16                 | 20                | 16 |
| 14430110     | 50                     | 8                 | 26           | 16                 | 15                | 16 |
| 14430125     | 50                     | 10                | 26           | 16                 | 15                | 16 |
| 14430140     | 63                     | 4                 | 33           | 22                 | 20                | 18 |
| 14430155     | 63                     | 5                 | 33           | 22                 | 15                | 18 |
| 14430170     | 63                     | 6                 | 33           | 22                 | 15                | 18 |
| 14430185     | 63                     | 8                 | 33           | 22                 | 15                | 18 |
| 14430200     | 63                     | 10                | 33           | 22                 | 15                | 18 |
| 14430215     | 63                     | 12                | 33           | 22                 | 10                | 18 |
| 14430230     | 80                     | 6                 | 36           | 22                 | 15                | 20 |
| 14430245     | 80                     | 8                 | 36           | 22                 | 15                | 20 |
| 14430260     | 80                     | 10                | 36           | 22                 | 15                | 18 |
| 14430275     | 80                     | 12                | 36           | 22                 | 15                | 18 |
| 14430290     | 80                     | 12                | 40           | 27                 | 15                | 18 |
| 14430305     | 80                     | 14                | 36           | 22                 | 10                | 18 |
| 14430320     | 80                     | 16                | 36           | 22                 | 15                | 18 |
| 14430335     | 80                     | 20                | 36           | 22                 | 10                | 18 |
| 14430350     | 100                    | 6                 | 46           | 27                 | 15                | 24 |
| 14430365     | 100                    | 7                 | 50           | 32                 | 15                | 24 |
| 14430380     | 100                    | 8                 | 50           | 32                 | 15                | 22 |
| 14430395     | 100                    | 10                | 46           | 27                 | 15                | 22 |
| 14430410     | 100                    | 10                | 50           | 32                 | 15                | 22 |
| 14430425     | 100                    | 12                | 50           | 32                 | 15                | 20 |
| 14430440     | 125                    | 8                 | 52           | 32                 | 15                | 26 |
| 14430455     | 125                    | 10                | 52           | 32                 | 15                | 24 |
| 14430470     | 125                    | 12                | 52           | 32                 | 15                | 22 |
| 14430485     | 125                    | 22                | 52           | 32                 | 10                | 22 |



**LEGENDA**


| PROFILO DEL TAGLIANTE DIN1836 |   |                                                                                               |
|-------------------------------|---|-----------------------------------------------------------------------------------------------|
| N                             | H | TAGLIANTE A FINIRE<br><i>FINISHING CUTTING EDGE PROFILE</i>                                   |
| NF                            |   | TAGLIANTE A SGROSSARE E SEMIFINIRE<br><i>ROUGHING AND SEMI-FINISHING CUTTING EDGE PROFILE</i> |
| NR                            |   | TAGLIANTE A SGROSSARE<br><i>ROUGHING CUTTING EDGE PROFILE</i>                                 |









## APPLICAZIONI MICROFRESE - MICRO END MILLS APPLICATIONS

### INFORMAZIONI TECNICHE

| Materiale fresa<br><i>Cutter material</i>                            | HM HSC<br>Skin <sup>3</sup> | HM HSC<br>Skin <sup>3</sup> | HM HSC<br>Skin <sup>3</sup> | HM HSC<br>Skin <sup>3</sup> |
|----------------------------------------------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Profilo del tagliente<br><i>Flutes profile</i>                       | H                           | HSC                         | HSC                         | HSC                         |
| N. taglienti Z<br><i>N. of teeth Z</i>                               | 2 piana<br>2 flat           | 2 torica<br>2 torus         | 2 sfera<br>2 ball           | 2 piana<br>2 flat           |
| Applicazioni<br><i>Applications</i>                                  | Cava<br>Slot                | Nervature<br>Rib            | Finitura<br>Finishing       | Nervature<br>Rib            |
| Tolleranza<br><i>Tolerance</i>                                       | ±0,01                       | 0/-0,008                    | 0/-0,008                    | 0/-0,008                    |
| Taglio al centro<br><i>Center cutting</i>                            | X                           | X                           | X                           | X                           |
| Lunghezza<br><i>Length</i>                                           | Extra<br>Corta              | -                           | -                           | -                           |
| Elica<br><i>Helix</i>                                                | 30°                         | 30°                         | 30°                         | 30°                         |
| Articolo<br><i>Item</i>                                              | Cod.<br>Code                | Cod.<br>Code                | Cod.<br>Code                | Cod.<br>Code                |
|                                                                      | 13632                       | 13636                       | 13638                       | 13640                       |
| Metalli lavorati<br><i>Worked metals</i>                             | V <sub>t</sub>              | V <sub>t</sub>              | V <sub>t</sub>              | V <sub>t</sub>              |
| Acciaio a basso contenuto di C<br><i>Low carbon content steel</i>    | •                           | •                           | •                           | •                           |
| Acciaio a medio contenuto di C<br><i>Medium carbon content steel</i> | •                           | •                           | •                           | •                           |
| Acciaio basso legato<br><i>low alloyed steel</i>                     | •                           | •                           | •                           | •                           |
| Acciaio alto legato<br><i>High alloyed steel</i>                     | •                           | •                           | •                           | •                           |
| Acciaio per stampi ed utensili<br><i>Tools and dies steel</i>        | •                           | •                           | •                           | •                           |
| Acciaio inox AISI<br><i>Stainless steel AISI</i>                     |                             | ○                           | ○                           | ○                           |
| Leghe Cr-Co<br><i>Cr-Co alloys</i>                                   |                             |                             |                             |                             |
| Duplex e Super Duplex<br><i>Duplex e Super Duplex</i>                |                             |                             |                             |                             |
| Ghisa grigia e sferoidale<br><i>Grey and spheroidal cast iron</i>    | •                           | •                           | •                           | •                           |
| Rame / Ottone<br><i>Copper / Brass</i>                               | ○                           | ○                           | ○                           | ○                           |
| Alluminio non legato<br><i>Unalloyed Aluminium</i>                   |                             |                             |                             |                             |
| Leghe alluminio Si<6%<br><i>Aluminium alloys Si&lt;6%</i>            |                             |                             |                             |                             |
| Titanio e sue leghe<br><i>Titanium and alloys</i>                    |                             |                             |                             |                             |
| Leghe resistenti al calore HRSA<br><i>Heat resistant alloys HRSA</i> |                             |                             |                             |                             |
| Acciaio temprato ≤ 54 HRC<br><i>Hardened steel ≤ 54 HRC</i>          | ○                           | ○                           | ○                           | ○                           |
| Acciaio temprato > 54 HRC<br><i>Hardened steel &gt; 54 HRC</i>       | ○                           | ○                           | ○                           | ○                           |
|                                                                      |                             |                             |                             |                             |
|                                                                      |                             |                             |                             |                             |
| ○ = possibile lavorazione<br>○ = acceptable working                  |                             |                             |                             |                             |
|                                                                      |                             |                             |                             |                             |
| • = lavorazione raccomandata<br>• = recommended working              |                             |                             |                             |                             |

Per specifici parametri di taglio visionare sito [www.gnuttibortolo.com](http://www.gnuttibortolo.com)  
For specific cutting parameters, please visit [www.gnuttibortolo.com](http://www.gnuttibortolo.com)

## APPLICAZIONI FRESE - END MILLS APPLICATIONS

### INFORMAZIONI TECNICHE Formule

|                                                 |                        |       |                                           |
|-------------------------------------------------|------------------------|-------|-------------------------------------------|
| VELOCITA' DI TAGLIO<br>CUTTING SPEED            | [m/min]                | $V_t$ | $= \frac{D \times n \times 3,14}{1000}$   |
| N° DI GIRI<br>TOOL REVOLUTION                   | [giri/min]<br>[rpm]    | $n$   | $= \frac{V_t \times 1000}{3,14 \times D}$ |
| AVANZAMENTO PER DENTE<br>FEED PER TOOTH         | [mm]                   | $f_z$ | $= \frac{F}{Z \times n}$                  |
| VELOCITA' DI AVANZAMENTO<br>FEED RATE           | [mm/min]               | $F$   | $= f_z \times Z \times n$                 |
| VOLUME DI TRUCIOLATURA<br>MATERIAL REMOVAL RATE | [cm <sup>3</sup> /min] | $Q$   | $= \frac{a_p \times a_e \times F}{1000}$  |

|                      |                        |                                                             |
|----------------------|------------------------|-------------------------------------------------------------|
| <b>D</b>             | [mm]                   | diámetro fresa<br><i>cutter diameter</i>                    |
| <b>V<sub>t</sub></b> | [m/min]                | velocità di taglio<br><i>cutting speed</i>                  |
| <b>F</b>             | [mm/min]               | velocità di avanzamento<br><i>feed rate</i>                 |
| <b>f<sub>z</sub></b> | [mm]                   | avanzamento per dente<br><i>feed per tooth</i>              |
| <b>Z</b>             |                        | numero denti<br><i>number of teeth</i>                      |
| <b>n</b>             | [giri/min]<br>[rpm]    | velocità rotazione<br><i>tool revolution</i>                |
| <b>a<sub>p</sub></b> | [mm]                   | profondità di passata assiale<br><i>axial depth of cut</i>  |
| <b>a<sub>e</sub></b> | [mm]                   | profondità di passata radiale<br><i>radial depth of cut</i> |
| <b>Q</b>             | [cm <sup>3</sup> /min] | volume di truciolatura<br><i>material removal rate</i>      |



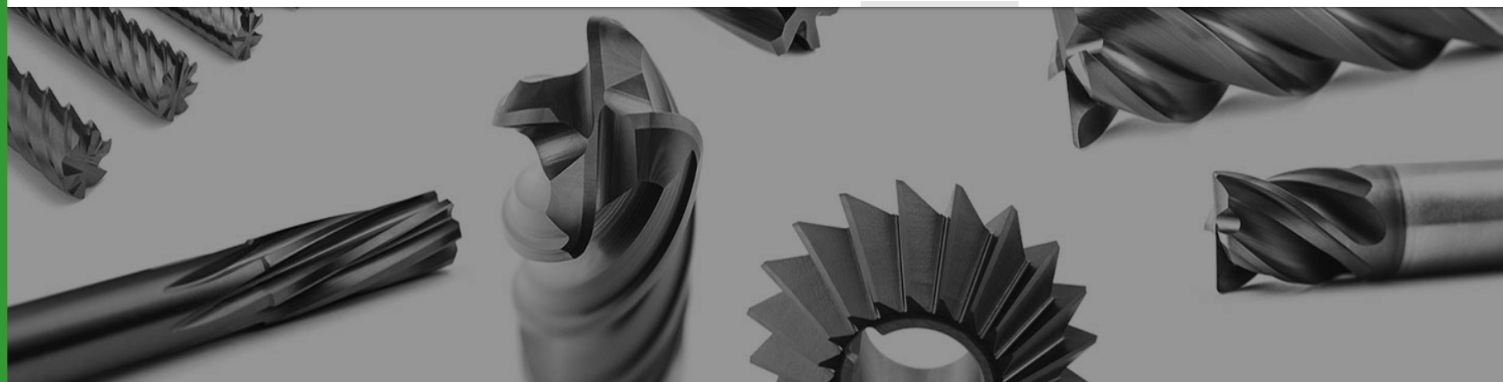
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REPARTO 1  
UTENSILI DA TAGLIO  
Assortimento Frese  
Marzo 2026.



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