

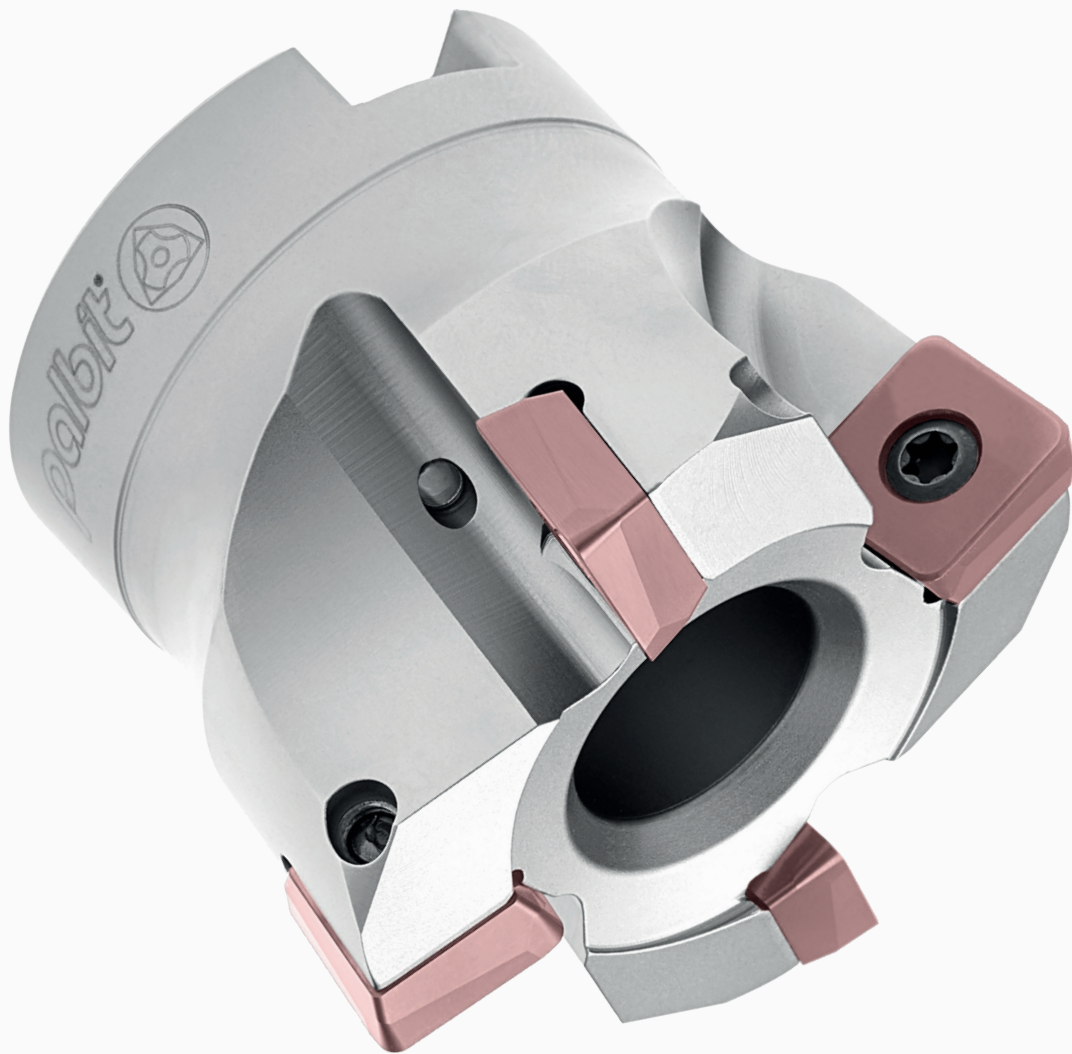
06410 | 06690 | 06815

# HIFEED

The best solution for high productivity milling

**MILLING**

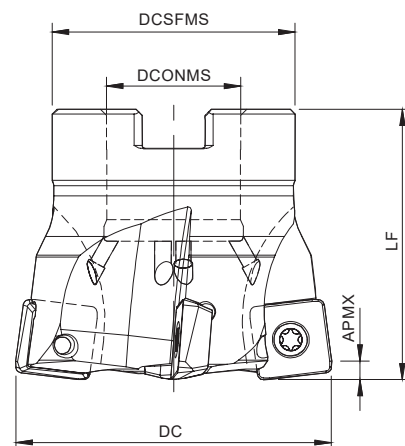
Facing | Profiling | Copying





## Arbor Mounting

KAPR=10° | GAMP=+2° | GAMF =+2° | RP=2,0



| Order code<br>Código | Reference<br>Referência<br>Referencia | CICT | Dimensions   Dimensões   Dimensiones (mm) |        |        |    | WT    | Specifications |              | Insert<br>Pastilha<br>Inserto | Stock |
|----------------------|---------------------------------------|------|---|--------|--------|----|-------|----------------|--------------|-------------------------------|-------|
|                      |                                       |      | DC  | DCONMS | DCSFMS | Lf |       | Arbor<br>Type  | APMX<br>(mm) |                               |       |
| 181149800            | 040A06410-05-02-016040                | 5    | 40  | 16     | 30     | 40 | 0,157 | A              | 1,00         | SO...0803...                  | ⊗     |
| 181153200            | 050A06410-06-02-022045                | 6    | 50  | 22     | 40     | 45 | 0,312 | A              | 1,00         | SO...0803...                  | ⊗     |
| 181149900            | 052A06410-06-02-022045                | 6    | 52  | 22     | 40     | 45 | 0,331 | A              | 1,00         | SO...0803...                  | ⊗     |

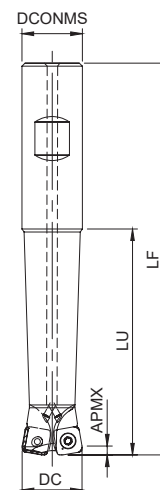
⊗ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta



## Weldon Shank

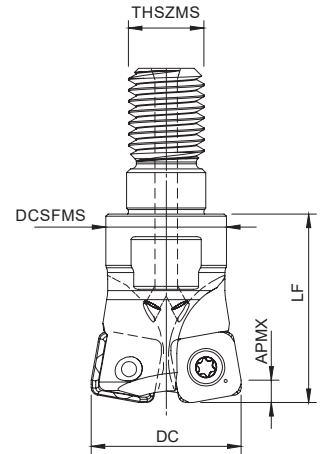
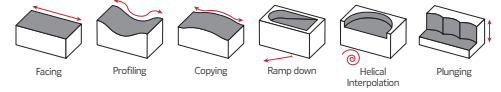
KAPR=10° | GAMP=+2° | GAMF =+2° | RP=2,0



| Order code<br>Código | Reference<br>Referência<br>Referencia | CICT | Dimensions   Dimensões   Dimensiones (mm) |        |     |     | WT    | Specifications | Insert<br>Pastilha<br>Inserto | Stock |
|----------------------|---------------------------------------|------|---|--------|-----|-----|-------|----------------|-------------------------------|-------|
|                      |                                       |      | DC  | DCONMS | Lf  | LU  |       | APMX (mm)      |                               |       |
| 181076300            | 020W06410-02-02-020130                | 2    | 20  | 20     | 130 | 75  | 0,360 | 1,00           | SO...0803...                  | ⊗     |
| 181080900            | 020W06410-02-02-020190                | 2    | 20  | 20     | 190 | 110 | 0,340 | 1,00           | SO...0803...                  | ⊗     |
| 181076400            | 025W06410-03-02-025140                | 3    | 25  | 25     | 140 | 80  | 0,410 | 1,00           | SO...0803...                  | ⊗     |
| 181081100            | 025W06410-03-02-025200                | 3    | 25  | 25     | 200 | 130 | 0,570 | 1,00           | SO...0803...                  | ⊗     |
| 181076500            | 032W06410-04-02-032150                | 4    | 32  | 32     | 150 | 90  | 0,760 | 1,00           | SO...0803...                  | ⊗     |
| 181081300            | 032W06410-04-02-032200                | 4    | 32  | 32     | 200 | 130 | 1,010 | 1,00           | SO...0803...                  | ⊗     |

⊗ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta



**Threaded Coupling**

KAPR=10° | GAMP=+2° | GAMF =+2° | RP=2,0

| Order code<br>Código | Reference<br>Referência<br>Referencia | CICT | Dimensions   Dimensões   Dimensiones (mm) |        |        |    | WT    | Specifications | Insert<br>Pastilha<br>Inserto | Stock |
|----------------------|---------------------------------------|------|---|--------|--------|----|-------|----------------|-------------------------------|-------|
|                      |                                       |      | DC  | THSZMS | DCSFMS | LF |       | APMX (mm)      |                               |       |
| 181071900            | 020R06410-02-02-M10025                | 2    | 20  | M10    | 16     | 25 | 0,040 | 1,00           | SO...0803...                  | ☉     |
| 181076600            | 025R06410-03-02-M12028                | 3    | 25  | M12    | 21     | 28 | 0,070 | 1,00           | SO...0803...                  | ☉     |
| 181076700            | 032R06410-04-02-M16035                | 4    | 32  | M16    | 29     | 35 | 0,160 | 1,00           | SO...0803...                  | ☉     |
| 181076800            | 035R06410-04-02-M16035                | 4    | 35  | M16    | 29     | 35 | 0,180 | 1,00           | SO...0803...                  | ☉     |
| 181076900            | 042R06410-05-02-M16035                | 5    | 42  | M16    | 29     | 35 | 0,220 | 1,00           | SO...0803...                  | ☉     |

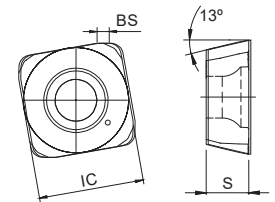
☉ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

**SO...0803...** Inserts | Pastilhas | Plaquetas



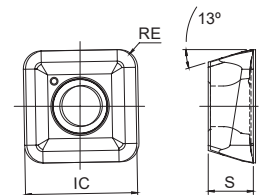
SOEW



SOEW



SOET



SOET

|                      | (2) Grade code   | P      |        |        | M      |        | K      |        |        | S      |        | Dimensions<br>Dimensões<br>Dimensiones<br>(mm) |      |     |     |
|----------------------|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|------|-----|-----|
|                      |                  | PVD    |        |        | PVD    |        | PVD    |        |        | PVD    |        | IC   | S    | RE  | BS  |
|                      |                  | X5     | T1     | G6     | X9     | G6     | X5     | T1     | G6     | X9     | G6     |  |      |     |     |
| (1)<br>Geometry code | ISO<br>Reference | PHP910 | PHP920 | PH7740 | PHH930 | PH7740 | PHP910 | PHP920 | PH7740 | PHH930 | PH7740 | IC   | S    | RE  | BS  |
| 1111884              | SOEW 080310 S    | ☉      | ☉      |        |        |        | ☉      | ☉      |        |        |        | 8,60   | 3,47 | 1,0 | 1,0 |
| 1112149              | SOET 080315-MS   |        |        | ☉      | ☉      | ☉      |        |        | ☉      | ☉      | ☉      | 8,60   | 3,47 | 1,5 | -   |

☉ First choice | Primeira opção | 1ª opción

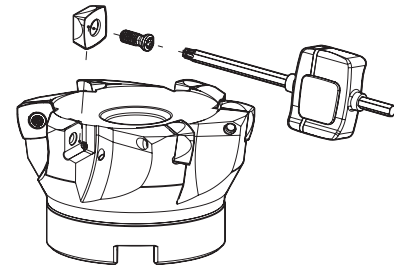
☉ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta  
Disponible bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

## SPARE PARTS Acessórios | Repuestos

| Cutter DC        | Insert Screw | Key (Torx) | Order separately |              |
|------------------|--------------|------------|------------------|--------------|
|                  |              |            | Key (Torx - Nm)  | Torque Value |
| A06410 - 40 - 52 | P0300800     | XT09       | DT0914           | 1,4          |
| R06410 - 20 - 42 | P0300800     | XT09       | DT0914           | 1,4          |
| W06410 - 20 - 32 | P0300800     | XT09       | DT0914           | 1,4          |



## GRADES SELECTION GUIDE Guia para selecção de graus | Tabla para selección de calidades

| ISO | PSM | Material                          | HB (Brinell) | Grades            |        |        |             |
|-----|-----|-----------------------------------|--------------|-------------------|--------|--------|-------------|
|     |     |                                   |              | ← Wear Resistance |        |        | Toughness → |
|     |     |                                   |              | PH5705            | PH5320 | PHP920 | PH7740      |
| P   | 1   | Unalloyed Steel                   | 125-220      | ●                 | ●      | ●      | ●           |
|     | 2   | Low-Alloyed Steel                 | 220-280      | ●                 | ●      |        | ●           |
|     | 3   | High-Alloyed Steel                | 280-380      | ●                 | ●      |        | ●           |
| M   | 4   | SS - Ferritic / Martensitic       | 200-330      |                   |        | ●      | ●           |
|     | 5   | SS - Austenitic                   | 200-330      |                   |        | ●      | ●           |
|     | 6   | SS - Austenitic-ferritic (Duplex) | 230-260      |                   |        | ●      | ●           |
| K   | 7   | Malleable Cast Iron               | 130-230      | ●                 | ●      |        |             |
|     | 8   | Grey Cast Iron                    | 180-245      | ●                 | ●      |        |             |
|     | 9   | Nodular Cast iron                 | 160-250      | ●                 | ●      |        |             |
| S   | 11  | Heat Resistant Super Alloys       | 200-320      |                   |        | ●      | ●           |

● Good Conditions     
 ● Average Conditions     
 ● Difficult Conditions

## RECOMMENDED CUTTING CONDITIONS Condições de corte recomendadas | Condiciones de corte recomendables

| ISO | PSM | Material                          | HB (Brinell) | Vc (m/min)        |         |         |             | Feed fz (mm/t) |            |
|-----|-----|-----------------------------------|--------------|-------------------|---------|---------|-------------|----------------|------------|
|     |     |                                   |              | ← Wear Resistance |         |         | Toughness → | SOEW 08...     | SOET 08... |
|     |     |                                   |              | PHP910            | PHP920  | PHH930  | PH7740      |                |            |
| P   | 1   | Unalloyed Steel                   | 125-220      | 180-250           | 180-250 | -       | 140-200     | 0,40-1,80      | 0,40-1,80  |
|     | 2   | Low-Alloyed Steel                 | 220-280      | 160-240           | 160-230 | -       | 130-180     | 0,40-1,80      | -          |
|     | 3   | High-Alloyed Steel                | 280-380      | 140-230           | 140-220 | -       | 100-170     | 0,40-1,50      | -          |
| M   | 4   | SS - Ferritic / Martensitic       | 200-330      | -                 | -       | 140-210 | 130-180     | -              | 0,40-1,30  |
|     | 5   | SS - Austenitic                   | 200-330      | -                 | -       | 120-170 | 110-160     | -              | 0,40-1,30  |
|     | 6   | SS - Austenitic-ferritic (Duplex) | 230-260      | -                 | -       | 100-150 | 90-150      | -              | 0,10-1,00  |
| K   | 7   | Malleable Cast Iron               | 130-230      | 180-300           | 160-270 | -       | -           | 0,40-1,80      | 0,40-1,80  |
|     | 8   | Grey Cast Iron                    | 180-245      | 160-250           | 140-250 | -       | -           | 0,40-1,80      | -          |
|     | 9   | Nodular Cast iron                 | 160-250      | 150-210           | 120-210 | -       | -           | 0,40-1,80      | -          |
| S   | 11  | Heat Resistant Super Alloys       | 200-320      |                   |         | 30-110  | 30-100      | -              | 0,40-1,00  |

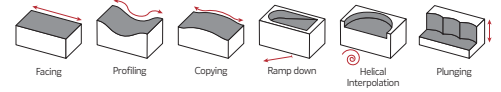
(Note 1) Cutting conditions  $a_e/D_c=70\%$ .

(Note 2) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:

- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

(Note 3) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:

- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

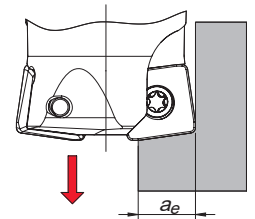
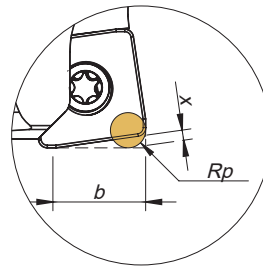


## CHIP BREAKER SELECTION GUIDE Guia para aplicações do quebra- aparas | Guía para aplicación del rompevirutas

| ISO | PSM | Material                          | HB (Brinell) | Chip breaker application |                      |
|-----|-----|-----------------------------------|--------------|--------------------------|----------------------|
|     |     |                                   |              | 1st choice               | Difficult Operations |
| P   | 1   | Unalloyed Steel                   | 125-220      | SOET 08...               | SOEW 08...           |
|     | 2   | Low-Alloyed Steel                 | 220-280      | SOEW 08...               | -                    |
|     | 3   | High-Alloyed Steel                | 280-380      | SOEW 08...               | -                    |
| M   | 4   | SS - Ferritic / Martensitic       | 200-330      | SOET 08...               | -                    |
|     | 5   | SS - Austenitic                   | 200-330      | SOET 08...               | -                    |
|     | 6   | SS - Austenitic-ferritic (Duplex) | 230-260      | SOET 08...               | -                    |
| K   | 7   | Malleable Cast Iron               | 130-230      | SOET 08...               | SOEW 08...           |
|     | 8   | Grey Cast Iron                    | 180-245      | SOEW 08...               | -                    |
|     | 9   | Nodular Cast iron                 | 160-250      | SOEW 08...               | -                    |
| S   | 11  | Heat Resistant Super Alloys       | 200-320      | SOET 08...               | -                    |

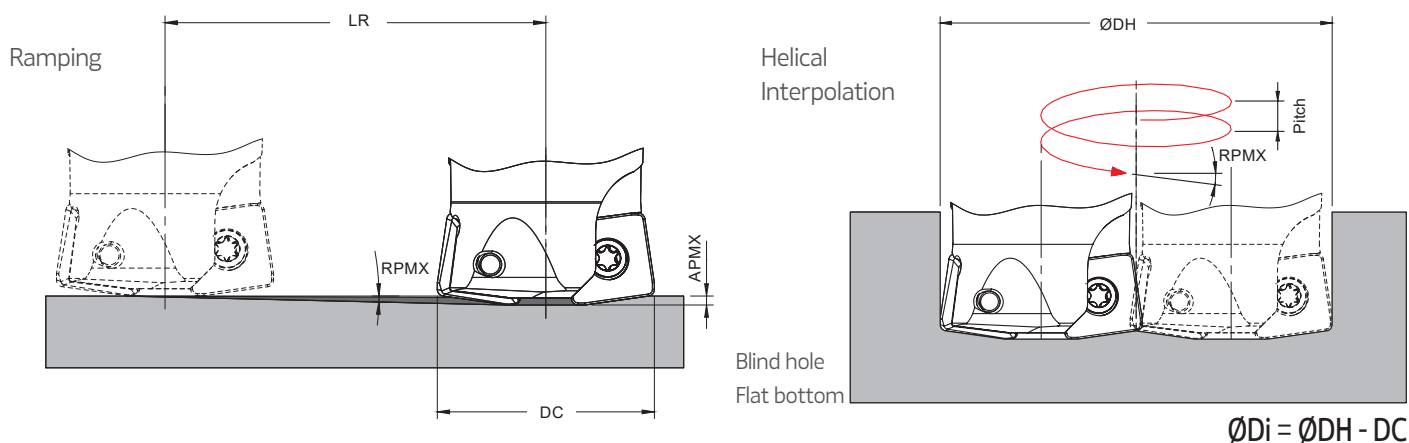
## PROGRAMMING DATA Dados para programação | Datos para la programación

| Insert       | Programming Data |     |     |                |
|--------------|------------------|-----|-----|----------------|
|              | Rp               | X   | b   | a <sub>e</sub> |
| SO... 0803.. | 2,0              | 0,8 | 6,8 | 6,3            |



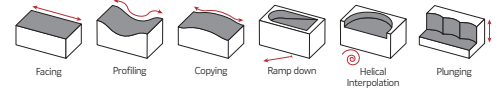
## RAMPING AND HELICAL INTERPOLATION

Descida em rampa e interpolação helicoidal | Bajada en rampa e interpolación circular



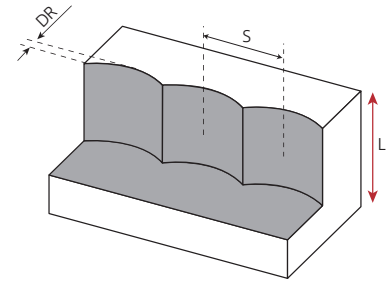
| DC | Ramping |      |        | Helical Interpolation |        |                |
|----|---------|------|--------|-----------------------|--------|----------------|
|    | RPMX    | APMX | Min LR | ØDHmin                | ØDHmax | Max Pitch/Rev. |
| 20 | 15      | 1,0  | 3,2    | 26,4                  | -      | 6              |
|    |         |      |        | -                     | 38,0   | 17             |
| 25 | 9,5     | 1,0  | 6,0    | 36,4                  | -      | 5              |
|    |         |      |        | -                     | 48,0   | 12             |
| 32 | 5,5     | 1,0  | 10,4   | 50,4                  | -      | 5              |
|    |         |      |        | -                     | 62,0   | 9              |
| 35 | 4,5     | 1,0  | 12,7   | 56,4                  | -      | 5              |
|    |         |      |        | -                     | 68,0   | 8              |
| 40 | 3,5     | 1,0  | 16,3   | 66,4                  | -      | 5              |
|    |         |      |        | -                     | 80,0   | 7              |
| 42 | 3,5     | 1,0  | 16,3   | 70,4                  | -      | 5              |
|    |         |      |        | -                     | 82,0   | 7              |
| 50 | 3,5     | 1,0  | 16,3   | 86,4                  | -      | 6              |
|    |         |      |        | -                     | 100,0  | 9              |
| 52 | 3,5     | 1,0  | 16,3   | 90,4                  | -      | 7              |
|    |         |      |        | -                     | 104,0  | 9              |

Note: During helical interpolation do not exceed APMX.



## PLUNGING Mergulho | Plunge

| L ≤ 3DC      | L > 3DC   | S max.                                |
|--------------|-----------|---------------------------------------|
| $f_z$ (mm/t) |           |                                       |
| 0,08-0,15    | 0,05-0,10 | $S_{max} = \sqrt{DC \cdot DR - DR^2}$ |



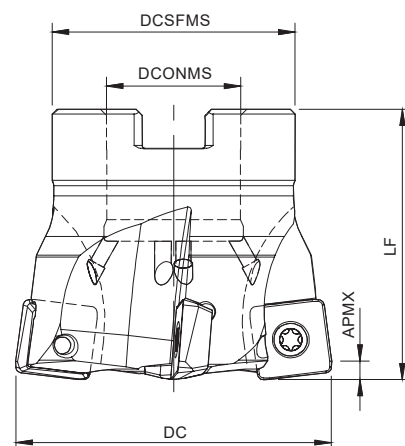
| S max and DR corresponding cutting diameter DC (mm) |         |      |      |      |      |      |      |      |
|---|---------|------|------|------|------|------|------|------|
| DR (mm)   | DC (mm) |      |      |      |      |      |      |      |
|   | 20      | 25   | 32   | 35   | 40   | 42   | 50   | 52   |
| 1,0   | 4,4     | 4,9  | 5,6  | 5,8  | 6,2  | 6,4  | 7,0  | 7,1  |
| 2,0   | 6,0     | 6,8  | 7,7  | 8,1  | 8,7  | 8,9  | 9,8  | 10,0 |
| 3,0   | 7,1     | 8,1  | 9,3  | 9,8  | 10,5 | 10,8 | 11,9 | 12,1 |
| 4,0   | 8,0     | 9,2  | 10,6 | 11,1 | 12,0 | 12,3 | 13,6 | 13,9 |
| 5,0   | 8,7     | 10,0 | 11,6 | 12,2 | 13,2 | 13,6 | 15,0 | 15,3 |
| 6,0   | 9,2     | 10,7 | 12,5 | 13,2 | 14,3 | 14,7 | 16,2 | 16,6 |

Note: Recommended for  $L \leq 4 Dc$  for extra long tool this step and side cut must be reduced.



## Arbor Mounting

KAPR=10° | GAMP=+5° | RP=2,5



| Order code<br>Código | Reference<br>Referência<br>Referencia | CICT | Dimensions   Dimensões   Dimensiones (mm) |        |        |    | WT    | Specifications |              | Insert<br>Pastilha<br>Inserto | Stock |
|----------------------|---------------------------------------|------|---|--------|--------|----|-------|----------------|--------------|-------------------------------|-------|
|                      |                                       |      | DC  | DCONMS | DCSFMS | LF |       | Arbor<br>Type  | APMX<br>(mm) |                               |       |
| 181069100            | 050A06690-04-05-022045                | 4    | 50  | 22     | 40     | 45 | 0,274 | A              | 1,50         | SO...13M5...                  | ☉     |
| 181111100            | 050A06690-05-05-022045                | 5    | 50  | 22     | 40     | 45 | 0,272 | A              | 1,50         | SO...13M5...                  | ☉     |
| 181029800            | 052A06690-04-05-022045                | 4    | 52  | 22     | 40     | 45 | 0,290 | A              | 1,50         | SO...13M5...                  | ☉     |
| 181033500            | 063A06690-05-05-027050                | 5    | 63  | 27     | 48     | 50 | 0,500 | A              | 1,50         | SO...13M5...                  | ☉     |
| 181029900            | 066A06690-05-05-027050                | 5    | 66  | 27     | 48     | 50 | 0,550 | A              | 1,50         | SO...13M5...                  | ☉     |
| 181030000            | 080A06690-06-05-027050                | 6    | 80  | 27     | 60     | 50 | 0,955 | A              | 1,50         | SO...13M5...                  | ☉     |
| 181113100            | 100A06690-08-05-032050*               | 8    | 100                                       | 32     | 70     | 50 | 1,500 | A              | 1,50         | SO...13M5...                  | ☉     |

☉ Stock item | Produto de stock | Itens de stock

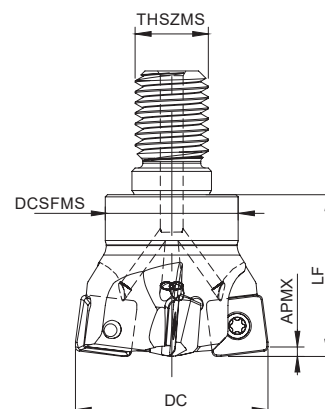
○ Available under request | Disponível sobre consulta | Disponible bajo consulta

\* For shank assembly a DIN 6912 screw is needed.



## Threaded Coupling

KAPR=10° | GAMP=+5° | RP=2,5

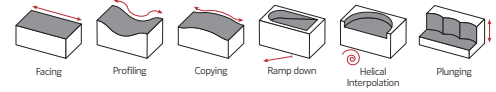


| Order code<br>Código | Reference<br>Referência<br>Referencia | CICT | Dimensions   Dimensões   Dimensiones (mm) |        |        |    | WT    | Specifications | Insert<br>Pastilha<br>Inserto | Stock |
|----------------------|---------------------------------------|------|---|--------|--------|----|-------|----------------|-------------------------------|-------|
|                      |                                       |      | DC  | THSZMS | DCSFMS | LF |       | APMX (mm)      |                               |       |
| 181038700            | 032R06690-03-05-M16035                | 3    | 32  | M16    | 29     | 35 | 0,145 | 1,50           | SO...13M5                     | ☉     |
| 181064600            | 035R06690-03-05-M16035                | 3    | 35  | M16    | 29     | 35 | 0,163 | 1,50           | SO...13M5                     | ☉     |
| 181038800            | 042R06690-04-05-M16035                | 4    | 42  | M16    | 29     | 35 | 0,194 | 1,50           | SO...13M5                     | ☉     |

☉ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta





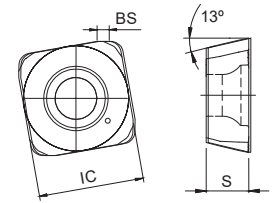
**SO...13M5...** Inserts | Pastilhas | Plaquetas



SOEW



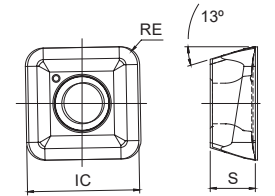
SOEW-MD



SOEW



SOET



SOET

|                              | <sup>(2)</sup> Grade code | P      |        |        | M      |        | K      |        |        | S      |        | Dimensions<br>Dimensões<br>Dimensiones<br>(mm) |      |      |     |
|------------------------------|---------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|------|------|-----|
|                              |                           | PVD    |        |        | PVD    |        | PVD    |        |        | PVD    |        |  |      |      |     |
|                              |                           | X5     | T1     | G6     | X9     | G6     | X5     | T1     | G6     | X9     | G6     | iC   | S    | R    | F   |
| <sup>(1)</sup> Geometry code | ISO Reference             | PHP910 | PHP920 | PH7740 | PHH930 | PH7740 | PHP910 | PHP920 | PH7740 | PHH930 | PH7740 |  |      |      |     |
| 1111906                      | SOEW 13M510 S             | ⊗      | ⊗      | ⊗      |        |        | ⊗      | ⊗      | ⊗      |        |        | 12,43  | 5,00 | 1,20 | 1,0 |
| 1112813                      | SOEW 13M510-MD            |        | ⊗      |        |        |        |        | ⊗      |        |        |        | 12,43  | 5,00 | 1,20 | 1,0 |
| 1112147                      | SOET 13M520-MS            | ○      |        | ⊗      | ⊗      | ⊗      |        |        | ⊗      | ⊗      | ⊗      | 12,43  | 5,00 | 2,0  | -   |

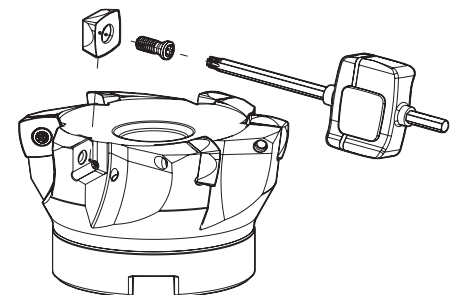
⊗ First choice | Primeira opção | 1ª opción    ⊗ Stock item | Produto de stock | Itens de stock    ○ Available under request | Disponível sobre consulta / Disponible bajo consulta    Insert order code = (1) Geometry Code + (2) Grade Code

**CHIP BREAKERS** Quebra- aparas | Rompevirutas

| Chip Breaker       | Features   Características   Características                                       |
|--------------------|--|
| Geometry <b>S</b>  | Stronger edge preparation for unstable conditions and difficult to machine steels. |
| Geometry <b>MD</b> | General application.   |
| Geometry <b>MS</b> | First choice for stainless steel and HRSA.   |




**SPARE PARTS** Acessórios | Repuestos

| Cutter DC        | Insert Screw | Key (Torx) | Order separately |              | Retaining Screw |
|------------------|--------------|------------|------------------|--------------|-----------------|
|                  |              |            | Key (Torx - Nm)  | Torque Value |                 |
| R06690 - 32 - 42 | P0401200     | XT15       | DT1530           | 3,0          | -               |
| A06690 - 50 - 80 | P0401200     | XT15       | DT1530           | 3,0          | -               |
| A06690 - 100     | P0401200     | XT15       | DT1530           | 3,0          | D1603500        |



## GRADES SELECTION GUIDE Guia para selecção de graus | Tabla para selección de calidades

| ISO | PSM | Material                          | HB (Brinell) | Grades            |        |             |        |
|-----|-----|-----------------------------------|--------------|-------------------|--------|-------------|--------|
|     |     |                                   |              | ← Wear Resistance |        | Toughness → |        |
|     |     |                                   |              | PHP910            | PHP920 | PHH930      | PH7740 |
| P   | 1   | Unalloyed Steel                   | 125-220      | ✓                 | ✓      |             | ✓      |
|     | 2   | Low-Alloyed Steel                 | 220-280      | ✓                 | ✓      |             | ✓      |
|     | 3   | High-Alloyed Steel                | 280-380      | ✓                 | ✓      |             | ✓      |
| M   | 4   | SS - Ferritic / Martensitic       | 200-330      |                   |        | ✓           | ✓      |
|     | 5   | SS - Austenitic                   | 200-330      |                   |        | ✓           | ✓      |
|     | 6   | SS - Austenitic-ferritic (Duplex) | 230-260      |                   |        | ✓           | ✓      |
| K   | 7   | Malleable Cast Iron               | 130-230      | ✓                 | ✓      |             | ✓      |
|     | 8   | Grey Cast Iron                    | 180-245      | ✓                 | ✓      |             | ✓      |
|     | 9   | Nodular Cast iron                 | 160-250      | ✓                 | ✓      |             | ✓      |
| S   | 11  | Heat Resistant Super Alloys       | 200-320      |                   |        | ✓           | ✓      |

 Good Conditions    
  Average Conditions    
  Difficult Conditions

## RECOMMENDED CUTTING CONDITIONS Condições de corte recomendadas | Condiciones de corte recomendables

| ISO | PSM | Material                          | HB (Brinell) | Vc (m/min)        |         |             |         | Feed fz (mm/t) |           |           |
|-----|-----|-----------------------------------|--------------|-------------------|---------|-------------|---------|----------------|-----------|-----------|
|     |     |                                   |              | ← Wear Resistance |         | Toughness → |         | SOEW S         | SOEW MD   | SOET MS   |
|     |     |                                   |              | PHP910            | PHP920  | PHH930      | PH7740  |                |           |           |
| P   | 1   | Unalloyed Steel                   | 125-220      | 180-250           | 180-250 | -           | 140-200 | 0,50-2,10      | 0,50-2,20 | 0,50-2,10 |
|     | 2   | Low-Alloyed Steel                 | 220-280      | 160-240           | 160-230 | -           | 130-180 | 0,50-2,10      | 0,50-2,20 | -         |
|     | 3   | High-Alloyed Steel                | 280-380      | 140-230           | 140-220 | -           | 100-170 | 0,50-2,00      | 0,50-2,10 | -         |
| M   | 4   | SS - Ferritic / Martensitic       | 200-330      | -                 | -       | 140-210     | 130-180 | -              | -         | 0,50-1,80 |
|     | 5   | SS - Austenitic                   | 200-330      | -                 | -       | 120-170     | 110-160 | -              | -         | 0,50-1,80 |
|     | 6   | SS - Austenitic-ferritic (Duplex) | 230-260      | -                 | -       | 100-150     | 90-150  | -              | -         | 0,50-1,50 |
| K   | 7   | Malleable Cast Iron               | 130-230      | 180-300           | 160-270 | -           | 140-220 | 0,50-2,10      | 0,50-2,20 | 0,50-2,10 |
|     | 8   | Grey Cast Iron                    | 180-245      | 160-250           | 140-250 | -           | 120-210 | 0,50-2,10      | 0,50-2,20 | -         |
|     | 9   | Nodular Cast iron                 | 160-250      | 150-210           | 120-210 | -           | 100-190 | 0,50-2,10      | 0,50-2,20 | -         |
| S   | 11  | Heat Resistant Super Alloys       | 200-320      | -                 | -       | 30-110      | 30-100  | -              | -         | 0,40-1,30 |

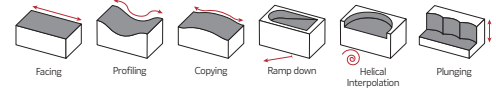
(Note 1) Cutting conditions  $a_e/D_c=70\%$ .

(Note 2) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:

- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

(Note 3) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:

- When using long shank;
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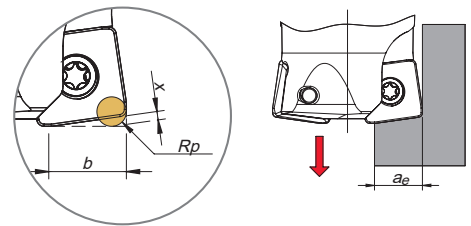


## CHIP BREAKER SELECTION GUIDE Guia para aplicações do quebra- aparas | Guía para aplicación del rompevirutas

| ISO | PSM | Material                          | HB (Brinell) | Chip breaker application |                      |
|-----|-----|-----------------------------------|--------------|--------------------------|----------------------|
|     |     |                                   |              | 1st choice               | Difficult Operations |
| P   | 1   | Unalloyed Steel                   | 125-220      | SOEW-MD                  | SOEW-S               |
|     | 2   | Low-Alloyed Steel                 | 220-280      | SOEW-MD                  | SOEW-S               |
|     | 3   | High-Alloyed Steel                | 280-380      | SOEW-MD                  | SOEW-S               |
| M   | 4   | SS - Ferritic / Martensitic       | 200-330      | SOET-MS                  | -                    |
|     | 5   | SS - Austenitic                   | 200-330      | SOET-MS                  | -                    |
|     | 6   | SS - Austenitic-ferritic (Duplex) | 230-260      | SOET-MS                  | -                    |
|     | 7   | Malleable Cast Iron               | 130-230      | SOET-MS                  | SOEW-S               |
| K   | 8   | Grey Cast Iron                    | 180-245      | SOEW-MD                  | SOEW-S               |
|     | 9   | Nodular Cast iron                 | 160-250      | SOEW-MD                  | SOEW-S               |
| S   | 11  | Heat Resistant Super Alloys       | 200-320      | SOET-MS                  | -                    |

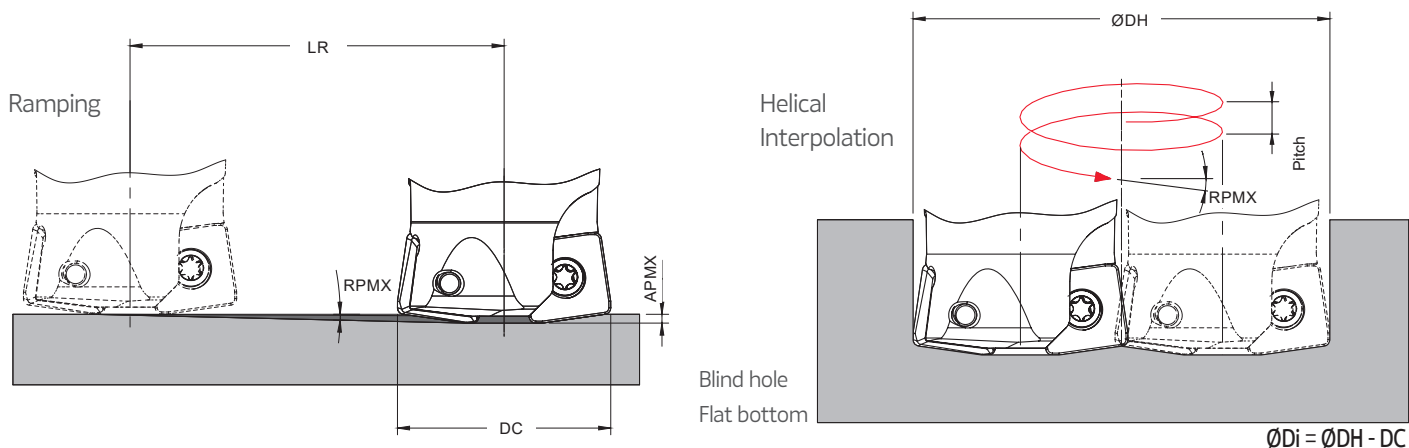
## PROGRAMMING DATA Dados para programação | Datos para la programación

| Insert       | Programming Data |     |      |      |
|--------------|------------------|-----|------|------|
|              | Rp               | X   | b    | ae   |
| SO... 13M5.. | 2,5              | 1,1 | 10,5 | 10,0 |



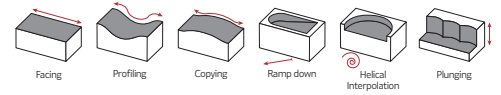
## RAMPING AND HELICAL INTERPOLATION

Descida em rampa e interpolação helicoidal | Bajada en rampa e interpolación circular



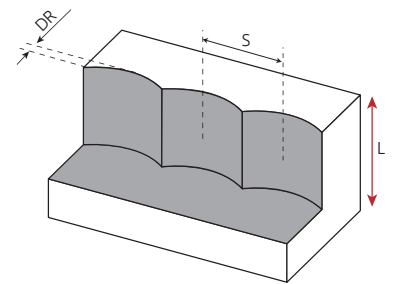
| DC  | Ramping |      |        | Helical Interpolation |        |                |
|-----|---------|------|--------|-----------------------|--------|----------------|
|     | RPMX    | APMX | Min LR | ØDHmin                | ØDHmax | Max Pitch/Rev. |
| 32  | 10,0    | 1,5  | 6,0    | 43                    | -      | 6              |
| 35  | 9,0     | 1,5  | 9,5    | 49                    | 62,0   | 16             |
|     |         |      |        | -                     | 68,0   | 6              |
| 42  | 6,4     | 1,5  | 13,4   | 63                    | -      | 7              |
|     |         |      |        | -                     | 82,0   | 14             |
| 50  | 4,3     | 1,5  | 19,9   | 79                    | -      | 6              |
|     |         |      |        | -                     | 98,0   | 11             |
| 52  | 4,0     | 1,5  | 21,5   | 83                    | -      | 6              |
|     |         |      |        | -                     | 102,0  | 10             |
| 63  | 3,0     | 1,5  | 28,6   | 105                   | -      | 6              |
|     |         |      |        | -                     | 124,0  | 10             |
| 66  | 2,6     | 1,5  | 33,0   | 111                   | -      | 6              |
|     |         |      |        | -                     | 130,0  | 9              |
| 80  | 2,0     | 1,5  | 43,0   | 139                   | -      | 6              |
|     |         |      |        | -                     | 158,0  | 8              |
| 100 | 1,0     | 1,5  | 85,9   | 179                   | -      | 4              |
|     |         |      |        | -                     | 198,0  | 5              |

Note: During helical interpolation do not exceed APMX.



## PLUNGING Mergulho | Plunge

| L ≤ 3DC      | L > 3DC   | S max.                                    |
|--------------|-----------|---|
| $f_z$ (mm/t) |           |   |
| 0,10-0,20    | 0,07-0,14 | $S_{max} = \sqrt{DC \cdot DR \cdot DR^2}$ |



| S max and DR corresponding cutting diameter DC (mm) |         |      |      |      |      |      |      |      |
|---|---------|------|------|------|------|------|------|------|
| DR (mm)   | DC (mm) |      |      |      |      |      |      |      |
|   | 32      | 35   | 42   | 50   | 52   | 63   | 66   | 80   |
| 1,0   | 5,6     | 5,8  | 6,4  | 7,0  | 7,1  | 7,9  | 8,1  | 8,9  |
| 2,0   | 7,7     | 8,1  | 8,9  | 9,8  | 10,0 | 11,0 | 11,3 | 12,5 |
| 3,0   | 9,3     | 9,8  | 10,8 | 11,9 | 12,1 | 13,4 | 13,7 | 15,2 |
| 4,0   | 10,6    | 11,1 | 12,3 | 13,6 | 13,9 | 15,4 | 15,7 | 17,4 |
| 5,0   | 11,6    | 12,2 | 13,6 | 15,0 | 15,3 | 17,0 | 17,5 | 19,4 |
| 6,0   | 12,5    | 13,2 | 14,7 | 16,2 | 16,6 | 18,5 | 19,0 | 21,1 |
| 7,0   | 13,2    | 14,0 | 15,7 | 17,3 | 17,7 | 19,8 | 20,3 | 22,6 |
| 8,0   | 13,9    | 14,7 | 16,5 | 18,3 | 18,8 | 21,0 | 21,5 | 24,0 |
| 9,0   | 14,4    | 15,3 | 17,2 | 19,2 | 19,7 | 22,0 | 22,6 | 25,3 |
| 10,0  | 14,8    | 15,8 | 17,9 | 20,2 | 20,5 | 23,0 | 23,7 | 26,5 |

Note: Recommended for  $L \leq 4 Dc$  for extra long tool this step and side cut must be reduced.

## TEST REPORT Relatório de Teste | Informe de Prueba

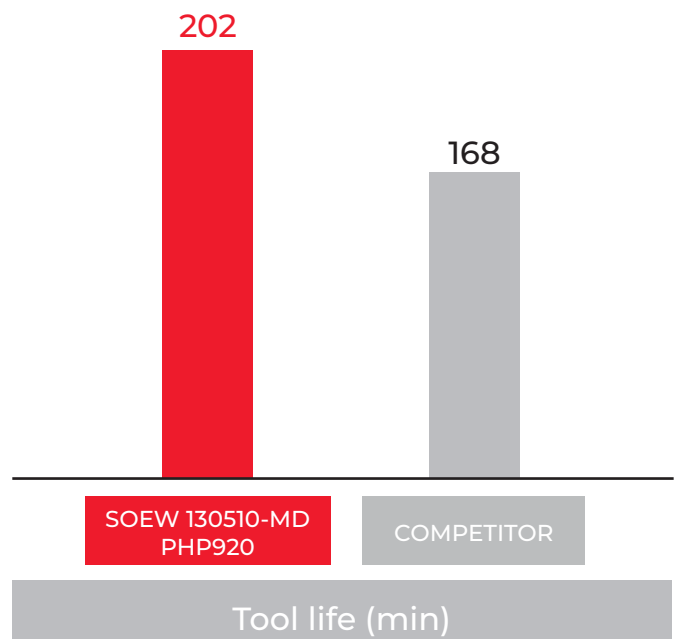
**Insert** SOEW 13M510-MD (ISO)

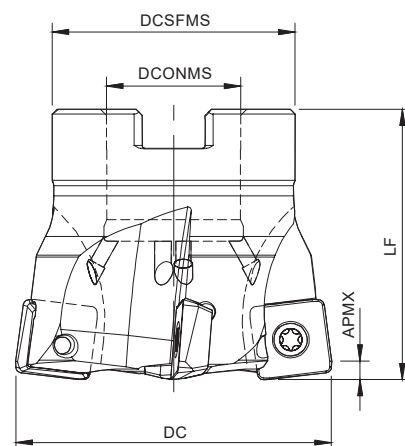
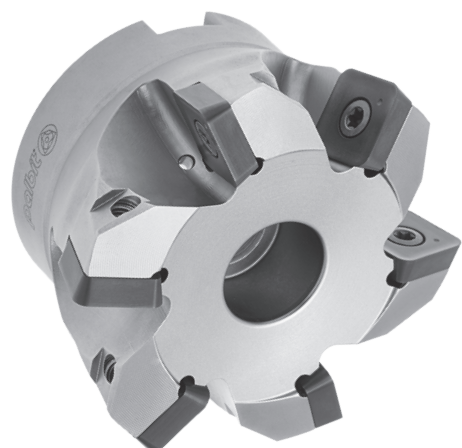
**Grade** PHP920



Workpiece material: 1.2738 Steel (38 HRC)

|                       |              |
|-----------------------|--------------|
| Cutting speed: $V_c$  | 160 m/min    |
| Feed per tooth: $f_z$ | 1,3 mm/tooth |
| Depth of cut: APMX    | 1,30 mm      |
| Stepover : $a_e$      | 65%          |
| Operation             | Face milling |
| Coolant               | Air          |





### Arbor Mounting

KAPR=15° | GAMP=+2° | RP=4,5

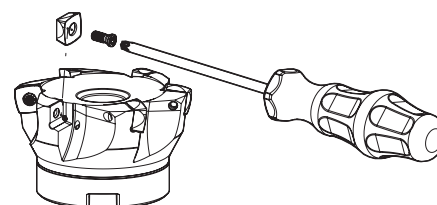
| Order code<br>Código | Reference<br>Referência<br>Referencia | CICT | Dimensions   Dimensões   Dimensiones (mm) |        |        |    | WT    | Specifications |              | Insert<br>Pastilha<br>Inserto | Stock |
|----------------------|---------------------------------------|------|---|--------|--------|----|-------|----------------|--------------|-------------------------------|-------|
|                      |                                       |      | DC  | DCONMS | DCSFMS | LF |       | Arbor<br>Type  | APMX<br>(mm) |                               |       |
| 181100400            | 063A06815-05-02-027050                | 5    | 63  | 27     | 48     | 50 | 0,460 | A              | 3,50         | SO...1605...                  | ⊗     |
| 181081900            | 066A06815-05-02-027050                | 5    | 66  | 27     | 48     | 50 | 0,500 | A              | 3,50         | SO...1605...                  | ⊗     |
| 181082000            | 080A06815-06-02-027050                | 6    | 80  | 27     | 60     | 50 | 0,900 | A              | 3,50         | SO...1605...                  | ⊗     |
| 181082100            | 100A06815-08-02-032050                | 8    | 100                                       | 32     | 80     | 50 | 1,600 | B              | 3,50         | SO...1605...                  | ⊗     |
| 181082200            | 125A06815-10-02-040063                | 10   | 125                                       | 40     | 90     | 63 | 2,900 | B              | 3,50         | SO...1605...                  | ⊗     |
| 181082300            | 160A06815-12-02-U040063               | 12   | 160                                       | 40     | 110    | 63 | 4,400 | C              | 3,50         | SO...1605...                  | ⊗     |

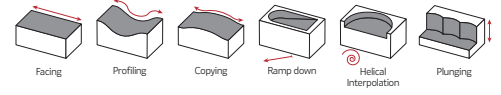
⊗ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta

## SPARE PARTS Acessórios | Repuestos

| Cutter<br>DC   | Insert Screw | Key (Torx) | Order separately |              | Order separately |                 |
|----------------|--------------|------------|------------------|--------------|------------------|-----------------|
|                |              |            | Key (Torx - Nm)  | Torque Value | Screw            | DIN 6368 Wrench |
| A06815 - 63-80 | P0501302     | PT20       | DT2050           | 5,0          | -                | -               |
| A06815 - 100   | P0501302     | PT20       | DT2050           | 5,0          | J0123510         | SD6368-12       |
| A06815 - 125   | P0501302     | PT20       | DT2050           | 5,0          | J0164110         | SD6368-16       |
| A06815 - 160   | P0501302     | PT20       | DT2050           | 5,0          | -                | -               |

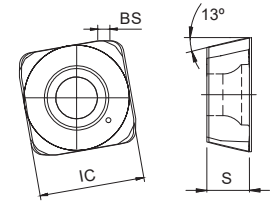




**SO...1605...** Inserts | Pastilhas | Plaquetas



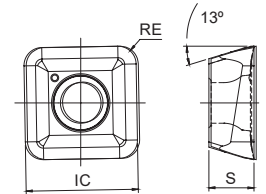
SOEW



SOEW



SOET



SOET

|                                 | <sup>(2)</sup> Grade code | P      |        |        | M      |        | K      |        |        | S      |        | Dimensions<br>Dimensões<br>Dimensiones<br>(mm) |      |      |      |
|---------------------------------|---------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|------|------|------|
|                                 |                           | PVD    |        |        | PVD    |        | PVD    |        |        | PVD    |        |  |      |      |      |
|                                 |                           | X5     | T1     | G6     | X9     | G6     | X5     | T1     | G6     | X9     | G6     | IC   | S    | RE   | BS   |
| <sup>(1)</sup><br>Geometry code | ISO Reference             | PHP910 | PHP920 | PH7740 | PHH930 | PH7740 | PHP910 | PHP920 | PH7740 | PHH930 | PH7740 | 16,40  | 5,26 | 1,20 | 1,50 |
| 1111907                         | SOEW 160512 S             | ⊗      | ⊗      | ⊗      | ⊗      | ⊗      | ⊗      | ⊗      | ⊗      | ⊗      | ⊗      | 16,40  | 5,26 | 1,20 | 1,50 |
| 1112221                         | SOET 160520-MS            |        |        | ⊗      | ⊗      | ⊗      |        |        | ⊗      | ⊗      | ⊗      | 16,40  | 5,26 | 2,00 | -    |

⊗ First choice | Primeira opção | 1ª opción




⊗ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta  
Disponível bajo consulta

Insert order code = (1) Geometry Code + (2) Grade Code

## GRADES SELECTION GUIDE Guia para selecção de graus | Tabla para selección de calidades

| ISO | PSM | Material                          | HB<br>(Brinell) | Grades            |        |             |        |
|-----|-----|-----------------------------------|-----------------|-------------------|--------|-------------|--------|
|     |     |                                   |                 | ← Wear Resistance |        | Toughness → |        |
|     |     |                                   |                 | PHP910            | PHP920 | PHH930      | PH7740 |
| P   | 1   | Unalloyed Steel                   | 125-220         | ✓                 | ✓      |             | ✓      |
|     | 2   | Low-Alloyed Steel                 | 220-280         | ✓                 | ✓      |             | ✓      |
|     | 3   | High-Alloyed Steel                | 280-380         | ✓                 | ✓      |             | ✓      |
| M   | 4   | SS - Ferritic / Martensitic       | 200-330         |                   |        | ✓           | ✓      |
|     | 5   | SS - Austenitic                   | 200-330         |                   |        | ✓           | ✓      |
|     | 6   | SS - Austenitic-ferritic (Duplex) | 230-260         |                   |        | ✓           | ✓      |
| K   | 7   | Malleable Cast Iron               | 130-230         | ✓                 | ✓      |             | ✓      |
|     | 8   | Grey Cast Iron                    | 180-245         | ✓                 | ✓      |             | ✓      |
|     | 9   | Nodular Cast iron                 | 160-250         | ✓                 | ✓      |             | ✓      |
| S   | 11  | Heat Resistant Super Alloys       | 200-320         |                   |        | ✓           | ✓      |

 Good Conditions    
  Average Conditions    
  Difficult Conditions

## RECOMMENDED CUTTING CONDITIONS Condições de corte recomendadas | Condiciones de corte recomendables

| ISO | PSM | Material                          | HB<br>(Brinell) | Vc (m/min)        |         |             |         | Feed fz (mm/t) |            |
|-----|-----|-----------------------------------|-----------------|-------------------|---------|-------------|---------|----------------|------------|
|     |     |                                   |                 | ← Wear Resistance |         | Toughness → |         | SOEW S...      | SOET MS... |
|     |     |                                   |                 | PHP910            | PHP920  | PHH930      | PH7740  |                |            |
| P   | 1   | Unalloyed Steel                   | 125-220         | 180-250           | 180-250 | -           | 140-200 | 0,50-2,10      | 0,50-2,20  |
|     | 2   | Low-Alloyed Steel                 | 220-280         | 160-240           | 160-230 | -           | 130-180 | 0,50-2,10      | 0,50-2,20  |
|     | 3   | High-Alloyed Steel                | 280-380         | 140-230           | 140-220 | -           | 100-170 | 0,50-2,00      | 0,50-1,80  |
| M   | 4   | SS - Ferritic / Martensitic       | 200-330         | -                 | -       | 140-210     | 130-180 | -              | 0,50-1,80  |
|     | 5   | SS - Austenitic                   | 200-330         | -                 | -       | 120-170     | 110-160 | -              | 0,50-1,80  |
|     | 6   | SS - Austenitic-ferritic (Duplex) | 230-260         | -                 | -       | 100-150     | 90-150  | -              | 0,50-1,50  |
| K   | 7   | Malleable Cast Iron               | 130-230         | 180-300           | 160-270 | -           | 140-220 | 0,50-2,10      | 0,50-2,00  |
|     | 8   | Grey Cast Iron                    | 180-245         | 160-250           | 140-250 | -           | 120-210 | 0,50-2,10      | 0,50-2,00  |
|     | 9   | Nodular Cast iron                 | 160-250         | 150-210           | 120-210 | -           | 100-190 | 0,50-2,10      | 0,50-1,80  |
| S   | 11  | Heat Resistant Super Alloys       | 200-320         | -                 | -       | 30-110      | 30-100  | -              | 0,40-1,30  |

(Note 1) Cutting conditions  $a_e/D_c=70\%$ .

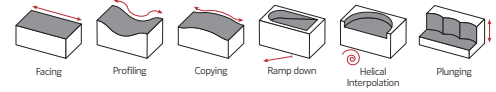
(Note 2) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:

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- When application has poor clamping rigidity or when using a low rigidity machine.



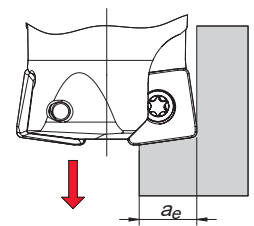
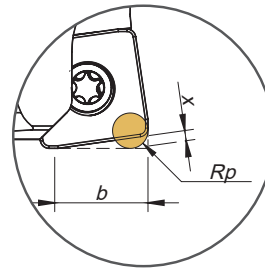


## CHIP BREAKER SELECTION GUIDE Guia para aplicações do quebra- aparas | Guía para aplicación del rompevirutas

| ISO | PSM | Material                          | HB (Brinell) | Chip breaker application |                      |
|-----|-----|-----------------------------------|--------------|--------------------------|----------------------|
|     |     |                                   |              | 1st choice               | Difficult Operations |
| P   | 1   | Unalloyed Steel                   | 125-220      | SOET 16...               | SOEW 16...           |
|     | 2   | Low-Alloyed Steel                 | 220-280      | SOEW 16...               | -                    |
|     | 3   | High-Alloyed Steel                | 280-380      | SOEW 16...               | -                    |
| M   | 4   | SS - Ferritic / Martensitic       | 200-330      | SOET 16...               | -                    |
|     | 5   | SS - Austenitic                   | 200-330      | SOET 16...               | -                    |
|     | 6   | SS - Austenitic-ferritic (Duplex) | 230-260      | SOET 16...               | -                    |
|     | 7   | Malleable Cast Iron               | 130-230      | SOET 16...               | SOEW 16...           |
| K   | 8   | Grey Cast Iron                    | 180-245      | SOEW 16...               | -                    |
|     | 9   | Nodular Cast iron                 | 160-250      | SOEW 16...               | -                    |
| S   | 11  | Heat Resistant Super Alloys       | 200-320      | SOET 16...               | -                    |

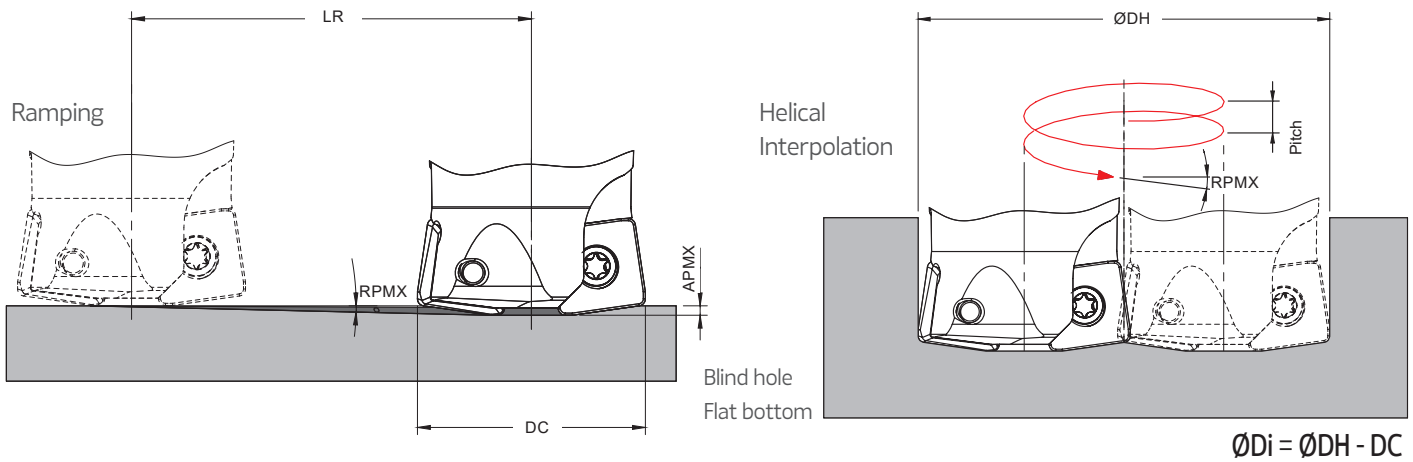
## PROGRAMMING DATA Dados para programação | Datos para la programación

| Insert       | Programming Data |     |      |                |
|--------------|------------------|-----|------|----------------|
|              | Rp               | X   | b    | a <sub>e</sub> |
| SO... 1605.. | 4,5              | 2,3 | 13,5 | 12,8           |



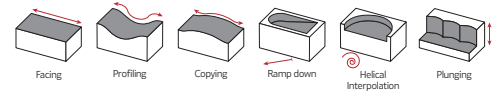
## RAMPING AND HELICAL INTERPOLATION

Descida em rampa e interpolação helicoidal | Bajada en rampa e interpolación circular



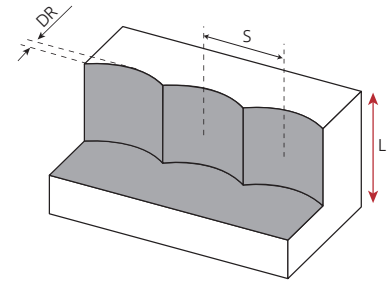
| DC  | Ramping |      |        | Helical Interpolation |        |                |
|-----|---------|------|--------|-----------------------|--------|----------------|
|     | RPMX    | APMX | Min LR | ØDHmin                | ØDHmax | Max Pitch/Rev. |
| 63  | 3,5     | 3,5  | 80,2   | 99,0                  | -      | 6              |
|     |         |      |        | -                     | 123,6  | 11             |
| 66  | 3,0     | 3,5  | 66,8   | 105                   | -      | 6              |
|     |         |      |        | -                     | 129,6  | 10             |
| 80  | 2,0     | 3,5  | 100,2  | 133                   | -      | 5              |
|     |         |      |        | -                     | 157,5  | 8              |
| 100 | 1,5     | 3,5  | 133,7  | 173                   | -      | 6              |
|     |         |      |        | -                     | 197,5  | 8              |
| 125 | 1,0     | 3,5  | 200,5  | 223                   | -      | 5              |
|     |         |      |        | -                     | 247,5  | 6              |
| 160 | 0,5     | 3,5  | 401,1  | 293                   | -      | 3              |
|     |         |      |        | -                     | 317,5  | 4              |

Note: During helical interpolation do not exceed APMX.



## PLUNGING Mergulho | Plunge

| L ≤ 3DC      | L > 3DC   | S max.                                |
|--------------|-----------|---------------------------------------|
| $f_z$ (mm/t) |           |                                       |
| 0,10-0,20    | 0,07-0,14 | $S_{max} = \sqrt{DC \cdot DR - DR^2}$ |



| S max and DR corresponding cutting diameter DC (mm) |         |      |
|---|---------|------|
| DR (mm)   | DC (mm) |      |
|   | 66      | 80   |
| 1,0   | 8,1     | 8,9  |
| 2,0   | 11,3    | 12,5 |
| 3,0   | 13,7    | 15,2 |
| 4,0   | 15,7    | 17,4 |
| 5,0   | 17,5    | 19,4 |
| 6,0   | 19,0    | 21,1 |
| 7,0   | 20,3    | 22,6 |
| 8,0   | 21,5    | 24,0 |
| 9,0   | 22,6    | 25,3 |
| 10,0  | 23,7    | 26,5 |
| 11,0  | 24,6    | 27,5 |
| 12,0  | 25,5    | 28,6 |

Note: Recommended for  $L \leq 4 Dc$  for extra long tool this step and side cut must be reduced.

06410 | 06690 | 06815

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