

TETRAFEED

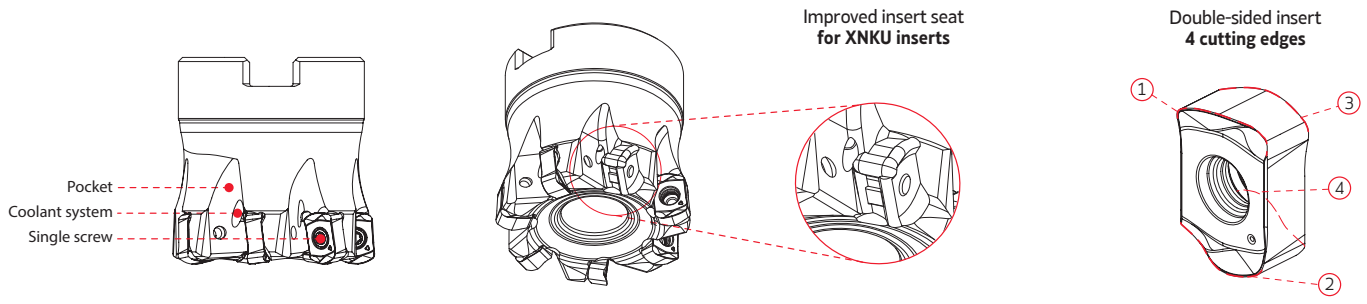
16320 | 16420

Double-sided
high feed milling solution



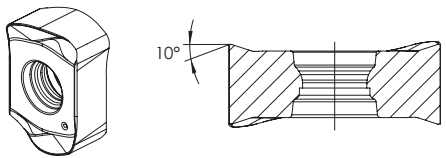
TETRAFEED 16320 | 16420 NEW

The tetrafeed line is expanding! With XNKU 06 and XNKU 12, there are no limits for high feed machining of either small or large sized components. The 4 cutting edge negative insert enables you to achieve feeds of up to 1,5mm/t and depth of cut up to 1,5 mm, leading to higher productivity.

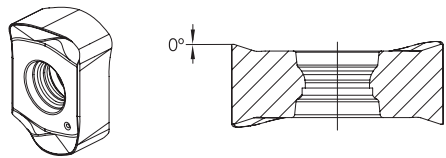


XNKU 06T3 | 1205 NEW

XNKU 06T310-MP



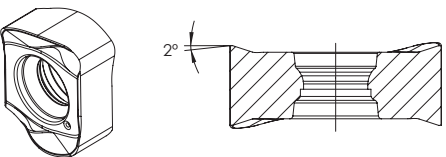
XNKU 06T310-MS



INSERT SIZE **06** XNKU 06T3



XNKU 120516-MP

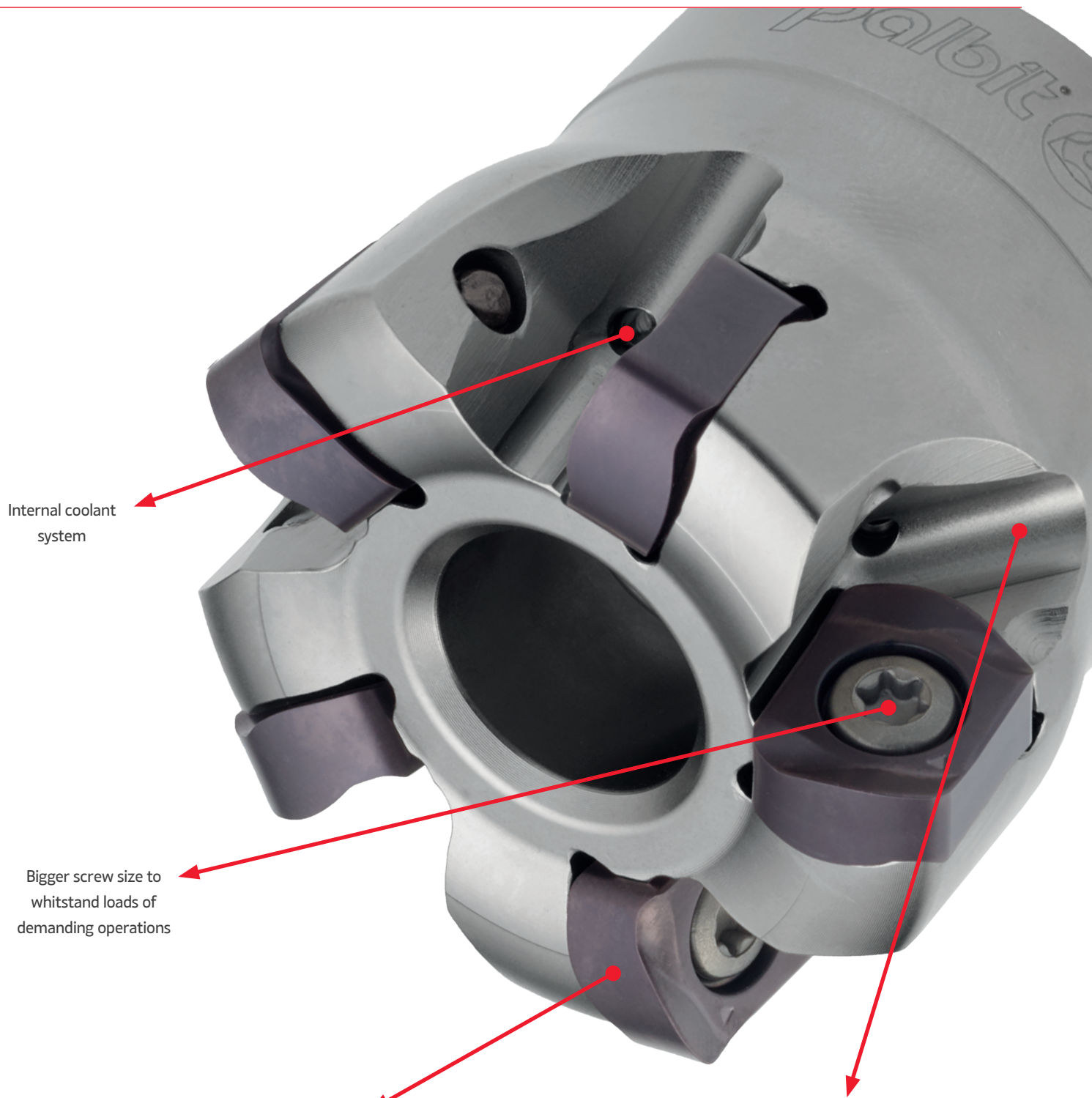


INSERT SIZE **12** XNKU 1205



GEOMETRY FEATURES || Características geométricas | Características geométricas

| Geometry | Features Características Características |
|---|--|
| Geometry MP General machining | Geometry with a reinforced cutting edge for general applications on different materials. |
| Geometry MS General machining | Geometry for stainless steel and HRSA. Suitable for alloy steel machining. |



Internal coolant system

Bigger screw size to withstand loads of demanding operations

Insert Width

- Robust insert with large cross section;

Cutting edge

- Improved cutting edge;
- Improved wear resistance;

Double-sided insert

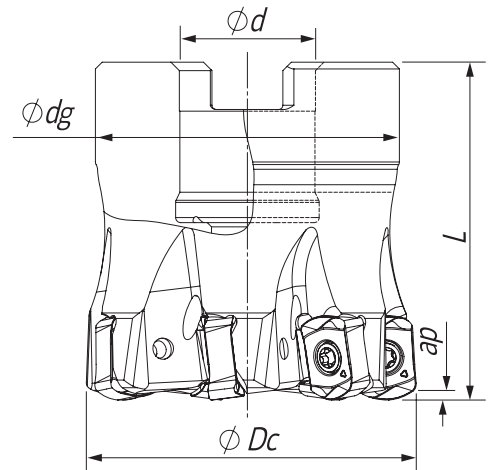
- Double-sided insert with 4 cutting edges;

Design

- Optimized design for better chip evacuation;

Pocket

- Strong pocket design for better cutter body durability;
- Improved insert seat;

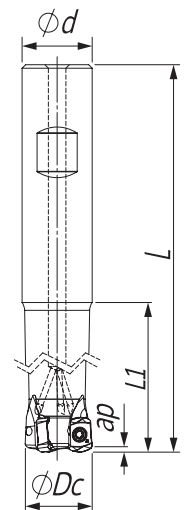


Arbor Mounting
 $\kappa_r=20^\circ$ | $\gamma_p=-7^\circ$ | $R_p=1,8$

| Order code Código | Reference Referência Referencia | | Dimensions Dimensões Dimensiones (mm) | | | | Kg | Specifications | | Insert | Stock |
|----------------------|---------------------------------------|--|---|----------|-----------|----|------|----------------|------------|------------|-------|
| | | | ϕDc | ϕd | ϕdg | L | | Ap max (mm) | Arbor Type | | |
| 181152300 | 040A16320-07-07-016040 | | 40 | 16 | 36 | 40 | 0,20 | 1,00 | A | XNKU 06... | |
| 181157500 | 050A16320-06-07-022040 | | 50 | 22 | 42 | 40 | 0,25 | 1,00 | A | XNKU 06... | |
| 181152400 | 050A16320-08-07-022040 | | 50 | 22 | 42 | 40 | 0,29 | 1,00 | A | XNKU 06... | |
| 181152500 | 052A16320-08-07-022040 | | 52 | 22 | 42 | 40 | 0,39 | 1,00 | A | XNKU 06... | |
| 181152600 | 063A16320-09-07-022040 | | 63 | 22 | 48 | 40 | 0,50 | 1,00 | A | XNKU 06... | |
| 181177800 | 080A16320-10-07-027050 | | 80 | 27 | 60 | 50 | 0,95 | 1,00 | A | XNKU 06... | |

Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta

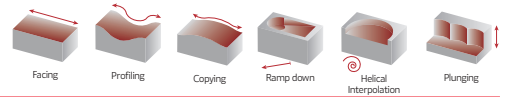


Weldon Shank
 $\kappa_r=20^\circ$ | $\gamma_p=-7^\circ$ | $R_p=1,8$

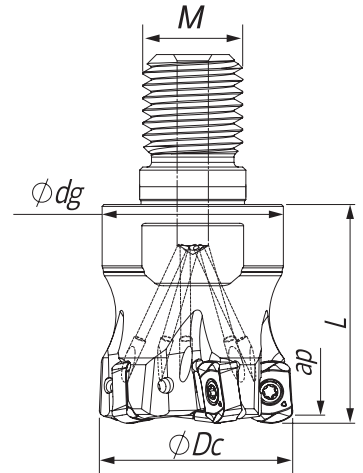
| Order code Código | Reference Referência Referencia | | Dimensions Dimensões Dimensiones (mm) | | | | Kg | Specifications | | Insert | Stock |
|----------------------|---------------------------------------|--|---|----------|-----|-----|------|----------------|------------|--------|-------|
| | | | ϕDc | ϕd | L | L1 | | Ap max (mm) | Arbor Type | | |
| 181161000 | 016W16320-02-07-016150 | | 16 | 16 | 150 | 50 | 0,19 | 1,00 | XNKU 06... | | |
| 181151900 | 020W16320-03-07-020160 | | 20 | 20 | 160 | 90 | 0,29 | 1,00 | XNKU 06... | | |
| 181152000 | 025W16320-04-07-025180 | | 25 | 25 | 180 | 100 | 0,40 | 1,00 | XNKU 06... | | |
| 181152100 | 032W16320-05-07-032200 | | 32 | 32 | 200 | 120 | 1,10 | 1,00 | XNKU 06... | | |

Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta



Threaded Coupling
 $K_r=20^\circ \mid \gamma_p=-7^\circ \mid R_p=1,8$



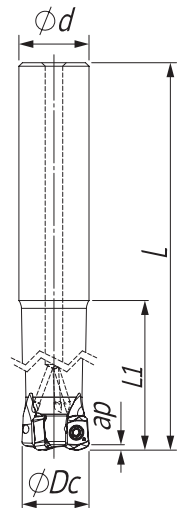
| Order code Código | Reference Referência Referencia | | Dimensions Dimensões Dimensiones (mm) | | | | Kg | Specifications | Insert | Stock |
|----------------------|---------------------------------------|-------------------------------------|---|----------|-----------|----|------|----------------|------------|-------|
| | | | ϕDc | ϕM | ϕdg | L | | A_p max (mm) | | |
| 181151300 | 016R16320-02-07-M08025 | <input checked="" type="checkbox"/> | 16 | M08 | 13 | 25 | 0,02 | 1,00 | XNKU 06... | |
| 181151400 | 020R16320-03-07-M10028 | <input checked="" type="checkbox"/> | 20 | M10 | 18 | 28 | 0,05 | 1,00 | XNKU 06... | |
| 181151500 | 025R16320-04-07-M12035 | <input checked="" type="checkbox"/> | 25 | M12 | 21 | 35 | 0,07 | 1,00 | XNKU 06... | |
| 181148000 | 032R16320-05-07-M16035 | <input checked="" type="checkbox"/> | 32 | M16 | 29 | 35 | 0,16 | 1,00 | XNKU 06... | |
| 181178600 | 035R16320-05-07-M16035 | <input checked="" type="checkbox"/> | 35 | M16 | 29 | 35 | 0,16 | 1,00 | XNKU 06... | |
| 181151600 | 035R16320-06-07-M16035 | <input checked="" type="checkbox"/> | 35 | M16 | 29 | 35 | 0,17 | 1,00 | XNKU 06... | |
| 181151700 | 040R16320-05-07-M16045 | <input checked="" type="checkbox"/> | 40 | M16 | 29 | 45 | 0,24 | 1,00 | XNKU 06... | |
| 181178500 | 040R16320-06-07-M16035 | <input checked="" type="checkbox"/> | 40 | M16 | 29 | 35 | 0,23 | 1,00 | XNKU 06... | |
| 181151800 | 042R16320-07-07-M16035 | <input checked="" type="checkbox"/> | 42 | M16 | 29 | 35 | 0,24 | 1,00 | XNKU 06... | |

Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta



Cylindrical Shank
 $K_r=20^\circ \mid \gamma_p=-7^\circ \mid R_p=1,8$



| Order code Código | Reference Referência Referencia | | Dimensions Dimensões Dimensiones (mm) | | | | Kg | Specifications | Insert | Stock |
|----------------------|---------------------------------------|-------------------------------------|---|----------|-----|-----|------|----------------|------------|-------|
| | | | ϕDc | ϕd | L | L1 | | A_p max (mm) | | |
| 181171900 | 016E16320-02-07-016150 | <input checked="" type="checkbox"/> | 16 | 16 | 150 | 50 | 0,19 | 1,00 | XNKU 06... | |
| 181183400 | 020E16320-03-07-020160 | <input checked="" type="checkbox"/> | 20 | 20 | 160 | 80 | 0,30 | 1,00 | XNKU 06... | |
| 181183500 | 025E16320-04-07-025180 | <input checked="" type="checkbox"/> | 25 | 25 | 180 | 100 | 0,54 | 1,00 | XNKU 06... | |
| 181183600 | 032E16320-05-07-032200 | <input checked="" type="checkbox"/> | 32 | 32 | 200 | 120 | 1,00 | 1,00 | XNKU 06... | |

Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta

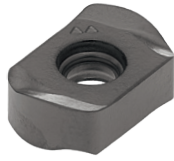
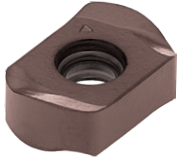
TETRAFEED 16320

Proprietary milling line

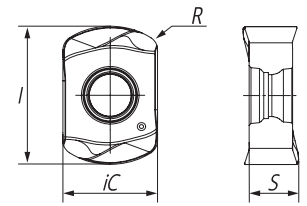
XNKU 06T3... | Inserts | Pastilhas | Plaquetas

XNKU-MP

XNKU-MS



XNKU-MP | MS



| Geometry code | ISO Reference | P | | | | | M | | | | K | | S | | | Dimensions Dimensões Dimensiones (mm) | | | |
|---------------|----------------|-----|-----|----|----|----|-----|-----|----|----|-----|-----|-----|-----|------|--|-------|-------|------|
| | | CVD | PVD | | | | CVD | PVD | | | CVD | PVD | CVD | PVD | | | | | |
| | | T9 | X5 | T1 | P4 | Z2 | T9 | X9 | Z2 | Z3 | T9 | T1 | T9 | X9 | Z3 | iC | S | I | R |
| 1112802 | XNKU 06T310-MP | ⊗ | ⊗ | ⊗ | ○ | | ⊗ | ⊗ | | | ⊗ | ⊗ | ⊗ | ⊗ | | 6,85 | 3,60 | 10,00 | 1,00 |
| NEW 1113209 | XNKU 06T310-MS | | | | | ⊗ | | | ⊗ | ⊗ | | | | ⊗ | 6,85 | 3,60 | 10,00 | 1,00 | |

⊗ First choice | Primeira opção | 1ª opción

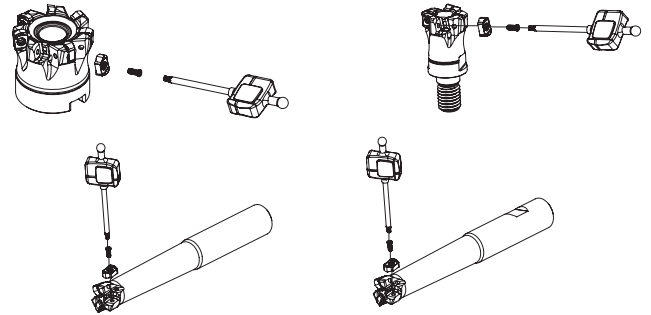
⊗ Stock item | Produto de stock | Itens de stock

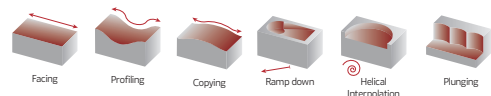
○ Available under request | Disponível sobre consulta
Disponível bajo consulta

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

SPARE PARTS Complementos | Repuestos

| Cutter ØDc | Insert Screw | Key (Torx) | Order separately | |
|----------------|--------------|------------|------------------|--------------|
| | | | Key (Torx - Nm) | Torque Value |
| A16320 - 40-80 | P0250704 | XT08 | DT0812 | 1,20 |
| R16320 - 20-42 | P0250704 | XT08 | DT0812 | 1,20 |
| W16320 - 20-32 | P0250704 | XT08 | DT0812 | 1,20 |
| E16320 - 20-42 | P0250704 | XT08 | DT0812 | 1,20 |





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

| ISO | PSM | Material | HB (Brinell) | Grades | | | | | | |
|-----|-----|-----------------------------------|--------------|-------------------|--------|--------|--------|-------------|--------|--------|
| | | | | ← Wear Resistance | | | | Toughness → | | |
| | | | | PHP910 | PHP920 | PHP930 | PHH930 | PHS740 | PHP530 | PHH530 |
| 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 | | | | ✓ | ✓ | | ✓ |



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 → | | | | |
| | | | | PHP910 | PHP920 | PHP930 | PHH930 | PHS740 | PHP530 | PHH530 | XNKU 06...-MP | XNKU 06...-MS |
| P | 1 | Unalloyed Steel | 125-220 | 180-250 | 180-250 | 160-230 | - | 160-230 | 180-340 | - | 0,50-1,50 | 0,50-1,50 |
| | 2 | Low-Alloyed Steel | 220-280 | 160-240 | 170-210 | 150-190 | - | 150-190 | 180-340 | - | 0,50-1,50 | 0,50-1,50 |
| | 3 | High-Alloyed Steel | 280-380 | 140-230 | 160-200 | 140-180 | - | 140-180 | 180-330 | - | 0,50-1,50 | 0,50-1,50 |
| M | 4 | SS - Ferritic / Martensitic | 200-330 | - | - | - | 130-170 | 120-180 | 150-270 | 170-280 | 0,50-1,40 | 0,50-1,40 |
| | 5 | SS - Austenitic | 200-330 | - | - | - | 100-160 | 100-150 | - | 160-280 | 0,50-1,40 | 0,50-1,40 |
| | 6 | SS - Austenitic-ferritic (Duplex) | 230-260 | - | - | - | 80-140 | 70-130 | - | 150-260 | 0,50-1,40 | 0,50-1,40 |
| K | 7 | Malleable Cast Iron | 130-230 | 180-300 | 180-320 | - | - | 160-300 | - | - | 0,50-1,50 | - |
| | 8 | Grey Cast Iron | 180-245 | 160-250 | 170-280 | - | - | 150-260 | - | - | 0,50-1,50 | - |
| | 9 | Nodular Cast iron | 160-250 | 150-210 | 100-240 | - | - | 80-220 | - | - | 0,50-1,50 | - |
| S | 11 | Heat Resistant Super Alloys | 200-320 | - | - | - | 30-75 | 30-70 | - | 30-150 | 0,50-1,30 | 0,50-1,30 |

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

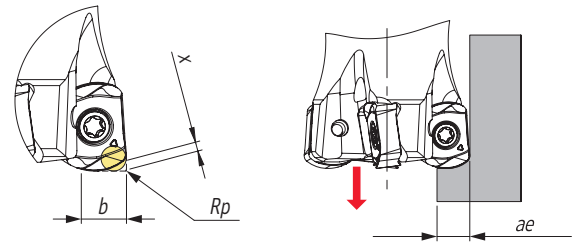
(Note 2) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:

- 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) When using $\varnothing D_c=16\text{mm}$ apply 70% or less feed (fz) from the table.

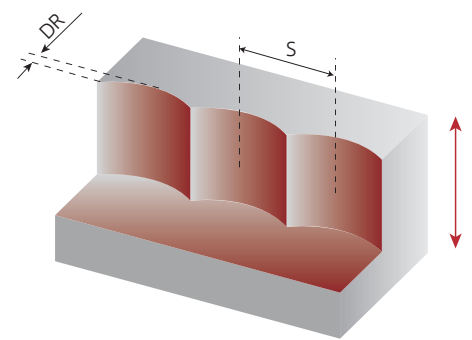
PROGRAMMING DATA | Dados para programação | Datos para la programación

| Insert | Programming Data | | | |
|--------------|------------------|-----|-----|-----|
| | Rp | X | b | ae |
| XNKU 06T3... | 1,8 | 0,4 | 3,6 | 3,4 |



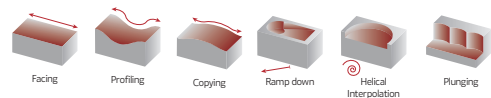
PLUNGING | Mergulho | Plunge

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



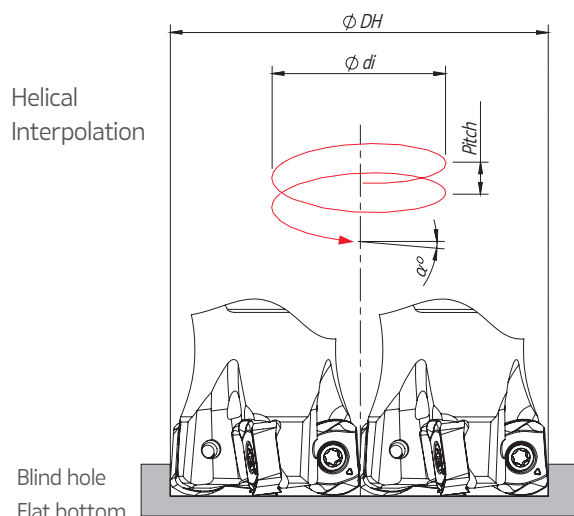
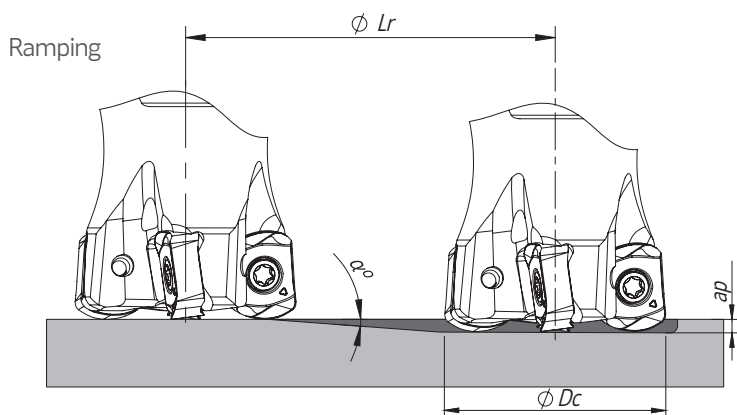
| S max and DR corresponding cutting diameter Dc (mm) | | | | | | | | | | |
|---|---------|-----|-----|-----|-----|------|------|------|------|------|
| DR (mm) | Dc (mm) | | | | | | | | | |
| | 16 | 20 | 25 | 32 | 35 | 40 | 42 | 50 | 52 | 60 |
| 1 | 3,9 | 4,4 | 4,9 | 5,6 | 5,8 | 6,2 | 6,4 | 7,0 | 7,1 | 7,9 |
| 2 | 5,3 | 6,0 | 6,8 | 7,7 | 8,1 | 8,7 | 8,9 | 9,8 | 10,0 | 11,0 |
| 3 | 6,2 | 7,1 | 8,1 | 9,3 | 9,8 | 10,5 | 10,8 | 11,9 | 12,1 | 13,4 |

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



RAMPING AND HELICAL INTERPOLATION

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



$$\text{Ødi} = \text{ØDH} - \text{ØDc}$$

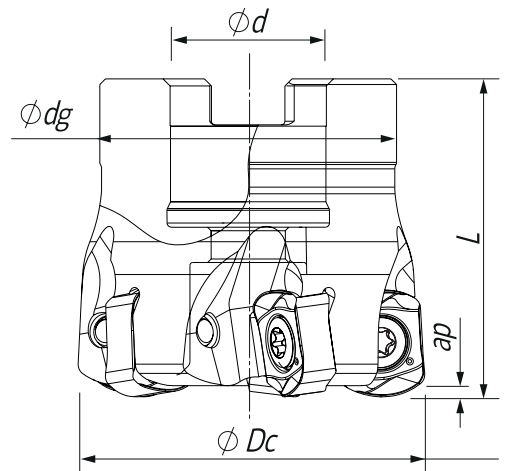
| ØDc | Ramping | | | Helical Interpolation | | |
|-----|-------------|--------|--------|-----------------------|------------|----------------|
| | Max Ramp α° | Max ap | Min Lr | ØDHmin | ØDHmax | Max Pitch/Rev. |
| 16 | 2,00 | 1 | 28,6 | 24,8 - | - 28,4 | 0,96 1,00 |
| 20 | 1,30 | 1 | 44,1 | 32,8 - | - 36,4 | 0,91 1,00 |
| 25 | 0,90 | 1 | 63,7 | 42,8 - | - 46,4 | 0,87 1,00 |
| 32 | 0,65 | 1 | 88,1 | 56,8 - | - 60,4 | 0,88 1,00 |
| 35 | 0,55 | 1 | 104,2 | 62,8 - | - 66,4 | 0,83 0,94 |
| 40 | 0,50 | 1 | 114,6 | 72,8 - | - 76,4 | 0,89 0,99 |
| 42 | 0,45 | 1 | 127,3 | 76,8 - | - 80,4 | 0,85 0,94 |
| 50 | 0,35 | 1 | 163,7 | 92,8 - | - 96,4 | 0,82 0,89 |
| 52 | 0,35 | 1 | 163,7 | 96,8 - | - 100,4 | 0,85 0,92 |
| 63 | 0,30 | 1 | 191,0 | 118,8 - | - 122,4 | 0,91 0,97 |
| 80 | 0,20 | 1 | 286,5 | 152,8 - | - 156,4 | 0,79 0,83 |

Note: During helical interpolation do not exceed max Pitch.

(*) Down cutting is recommended, tool pass rotation should be counter-clockwise.

(*) In case of ramping and helical interpolation, apply 70% or less feed (fz) from recommended cutting conditions table.





Arbor Mounting
 $K_r=20^\circ$ | $\gamma_p=-7^\circ$ | $R_p=3,2$

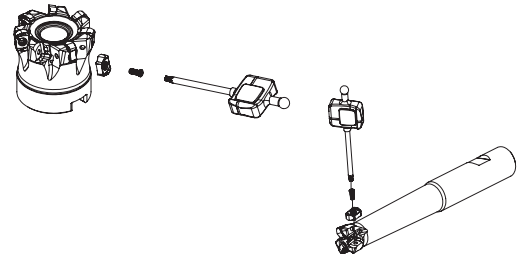
| Order code Código | Reference Referência Referencia | | Dimensions Dimensões Dimensiones (mm) | | | | Kg | Specifications | | Insert | Stock |
|----------------------|---------------------------------------|---|---|----------|-----------|----|------|----------------|------------|-------------|-------|
| | | | ϕDc | ϕd | ϕdg | L | | A_p max (mm) | Arbor Type | | |
| 181169300 | 050A16420-04-07-022045 | 4 | 50 | 22 | 42 | 45 | 0,28 | 1,50 | A | XN KU 12... | |
| 181180100 | 050A16420-05-07-022045 | 5 | 50 | 22 | 42 | 45 | 0,31 | 1,50 | A | XN KU 12... | |
| 181178400 | 052A16420-04-07-022045 | 4 | 52 | 22 | 42 | 45 | 0,33 | 1,50 | A | XN KU 12... | |
| 181180200 | 052A16420-05-07-022045 | 5 | 52 | 22 | 42 | 45 | 0,33 | 1,50 | A | XN KU 12... | |
| 181180300 | 063A16420-05-07-027050 | 5 | 63 | 27 | 48 | 50 | 0,51 | 1,50 | A | XN KU 12... | |
| 181180400 | 063A16420-06-07-027050 | 6 | 63 | 27 | 48 | 50 | 0,52 | 1,50 | A | XN KU 12... | |
| 181180500 | 066A16420-05-07-027050 | 5 | 66 | 27 | 48 | 50 | 0,54 | 1,50 | A | XN KU 12... | |
| 181180600 | 066A16420-06-07-027050 | 6 | 66 | 27 | 48 | 50 | 0,55 | 1,50 | A | XN KU 12... | |
| 181177900 | 080A16420-06-07-027050 | 6 | 80 | 27 | 60 | 50 | 0,94 | 1,50 | A | XN KU 12... | |
| 181180700 | 080A16420-08-07-027050 | 8 | 80 | 27 | 60 | 50 | 0,95 | 1,50 | A | XN KU 12... | |
| 181180800 | 100A16420-06-07-032050 | 6 | 100 | 32 | 80 | 50 | 1,21 | 1,50 | A | XN KU 12... | |
| 181180900 | 100A16420-08-07-032050 | 8 | 100 | 32 | 80 | 50 | 1,24 | 1,50 | A | XN KU 12... | |

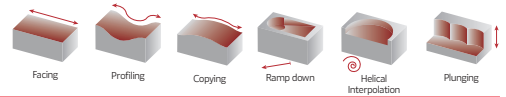
Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta

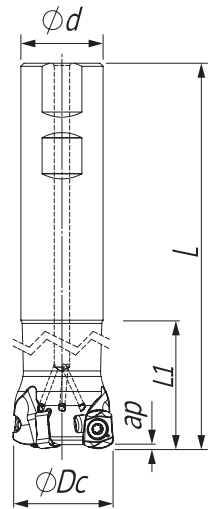
SPARE PARTS Complementos | Repuestos

| Cutter ϕDc | Order separately | | | |
|---------------------|------------------|------------|-----------------|--------------|
| | Insert Screw | Key (Torx) | Key (Torx - Nm) | Torque Value |
| A16420 - 50-80 | P0451400 | XT20 | DT2050 | 5,0 |
| A16420 - 100 | P0451400 | PT20 | DT2050 | 5,0 |
| W16420 - 32-40 | P0451400 | XT20 | DT2050 | 5,0 |





Weldon Shank
 $K_r=20^\circ$ | $\gamma_p=-7^\circ$ | $R_p=3,2$

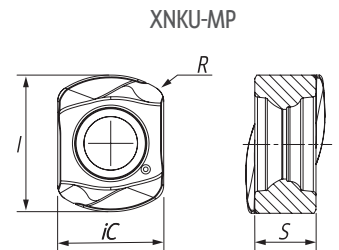
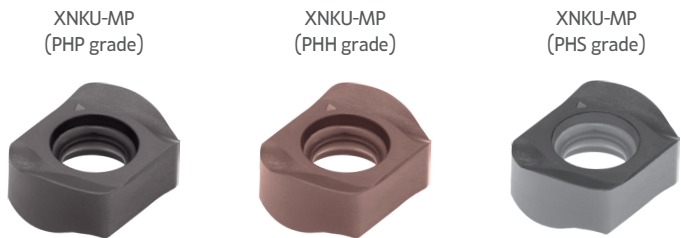


| Order code Código | Reference Referência Referencia | | Dimensions Dimensões Dimensiones (mm) | | | | Kg | Specifications | Insert | Stock |
|----------------------|---------------------------------------|---|---|----|-----|-----|------|----------------|------------|-------|
| | | | ØDc | Ød | L | L1 | | Ap max (mm) | | |
| 181181000 | 032W16420-02-07-032150 | 2 | 32 | 32 | 150 | 70 | 0,80 | 1,50 | XNKU 12... | |
| 181181100 | 032W16420-02-07-032200 | 2 | 32 | 32 | 200 | 120 | 1,10 | 1,50 | XNKU 12... | |
| 181181200 | 035W16420-02-07-032150 | 2 | 35 | 32 | 150 | 45 | 0,90 | 1,50 | XNKU 12... | |
| 181181300 | 035W16420-02-07-032200 | 2 | 35 | 32 | 200 | 45 | 1,20 | 1,50 | XNKU 12... | |
| 181181400 | 040W16420-03-07-032150 | 3 | 40 | 32 | 150 | 45 | 1,10 | 1,50 | XNKU 12... | |
| 181181500 | 040W16420-03-07-032220 | 3 | 40 | 32 | 220 | 45 | 1,40 | 1,50 | XNKU 12... | |

Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta

XNKU 1205... || Inserts | Pastilhas | Plaquetas



| Geometry code | ISO Reference | P | | | | M | | K | | | S | | Dimensions Dimensões Dimensiones (mm) | | | | |
|---------------|----------------|-----|----|-----|----|-----|-----|-----|----|-----|----|-----|---|------|-------|------|---|
| | | CVD | | PVD | | CVD | PVD | CVD | | PVD | | CVD | PVD | iC | S | I | R |
| | | T9 | X5 | T1 | P4 | T9 | X9 | T9 | X5 | T1 | T9 | X9 | | | | | |
| 1113071 | XNKU 120516-MP | | | | | | | | | | | | 11,70 | 5,90 | 15,00 | 1,60 | |






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

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

| ISO | PSM | Material | HB (Brinell) | Grades | | | | |
|-----|-----|-----------------------------------|-----------------|---|---|---|---|---|
| | | | | ← Wear Resistance | | | Toughness → | |
| | | | | PHP910  | PHP920  | PHP930  | PHH930  | PHS740  |
| 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

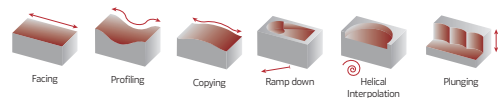
| ISO | PSM | Material | HB (Brinell) | Vc (m/min) | | | | | Feed fz (mm/t) XNKU 12...-MP |
|-----|-----|-----------------------------------|-----------------|-------------------|---------|---------|-------------|---------|---------------------------------|
| | | | | ← Wear Resistance | | | Toughness → | | |
| | | | | PHP910 | PHP920 | PHP930 | PHH930 | PHS740 | |
| P | 1 | Unalloyed Steel | 125-220 | 180-250 | 180-250 | 160-230 | - | 160-230 | 0,50-1,50 |
| | 2 | Low-Alloyed Steel | 220-280 | 160-240 | 170-210 | 150-190 | - | 150-190 | 0,50-1,50 |
| | 3 | High-Alloyed Steel | 280-380 | 140-230 | 160-200 | 140-180 | - | 140-180 | 0,50-1,50 |
| M | 4 | SS - Ferritic / Martensitic | 200-330 | - | - | - | 130-170 | 120-180 | 0,50-1,40 |
| | 5 | SS - Austenitic | 200-330 | - | - | - | 100-160 | 100-150 | 0,50-1,40 |
| | 6 | SS - Austenitic-ferritic (Duplex) | 230-260 | - | - | - | 80-140 | 70-130 | 0,50-1,40 |
| K | 7 | Malleable Cast Iron | 130-230 | 180-300 | 180-320 | - | - | 160-300 | 0,50-1,50 |
| | 8 | Grey Cast Iron | 180-245 | 160-250 | 170-280 | - | - | 150-260 | 0,50-1,50 |
| | 9 | Nodular Cast iron | 160-250 | 150-210 | 100-240 | - | - | 80-220 | 0,50-1,50 |
| S | 11 | Heat Resistant Super Alloys | 200-320 | - | - | - | 30-75 | 30-70 | 0,50-1,30 |

(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:

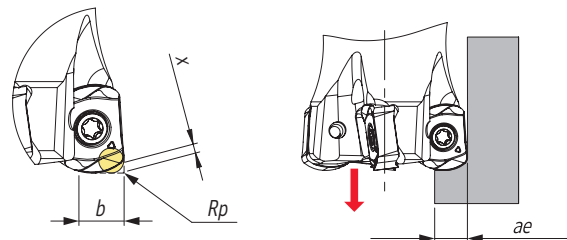
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

(Note 3) When using $\varnothing D_c=16\text{mm}$ apply 70% or less feed (fz) from the table.



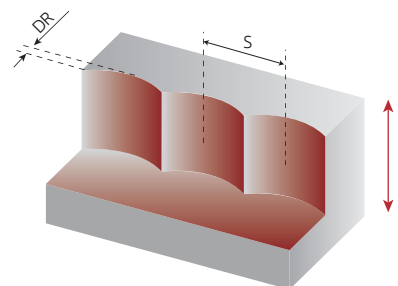
PROGRAMMING DATA | Dados para programação | Datos para la programación

| Insert | Programming Data | | | |
|----------------|------------------|------|-----|-----|
| | Rp | X | b | ae |
| XNKU 120516-MP | 3,2 | 0,65 | 7,5 | 7,1 |



PLUNGING | Mergulho | Plunge

| L ≤ 3Dc | L > 3Dc | S max. |
|-----------|-----------|---------------------------------------|
| fz (mm/t) | | |
| 0,10-0,15 | 0,08-0,12 | $S_{max} = \sqrt{Dc \cdot Dr - Dr^2}$ |



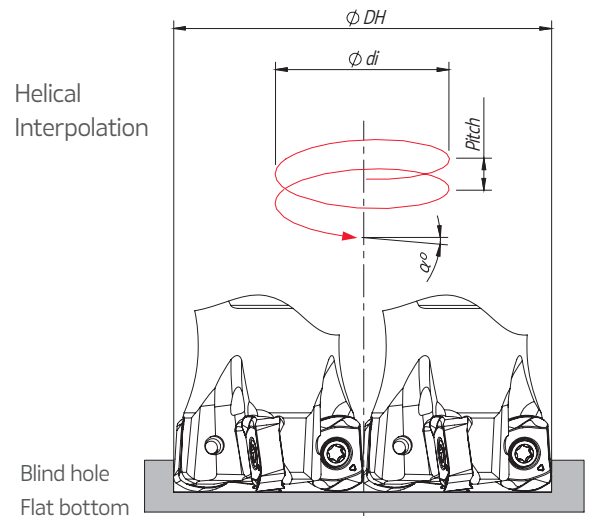
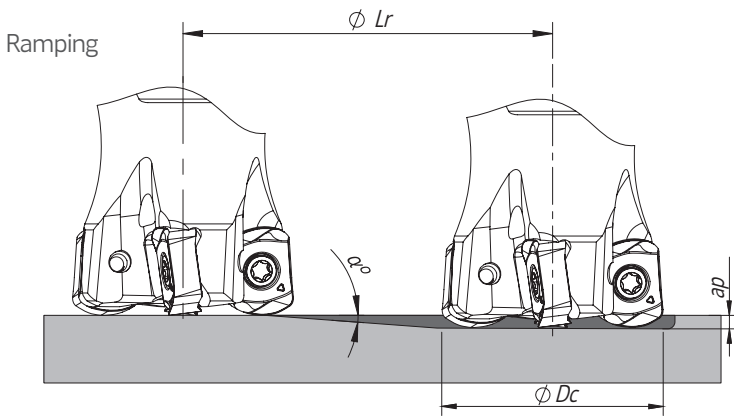
| S max and DR corresponding cutting diameter Dc (mm) | | | | | | | | | |
|---|---------|------|------|------|------|------|------|------|------|
| DR (mm) | Dc (mm) | | | | | | | | |
| | 32 | 35 | 40 | 50 | 52 | 63 | 66 | 80 | 100 |
| 1 | 5,6 | 5,8 | 6,2 | 7,0 | 7,1 | 7,9 | 8,1 | 8,9 | 9,9 |
| 2 | 7,7 | 8,1 | 8,7 | 9,8 | 10,0 | 11,0 | 11,3 | 12,5 | 14,0 |
| 3 | 9,3 | 9,8 | 10,5 | 11,9 | 12,1 | 13,4 | 13,7 | 15,2 | 17,1 |
| 4 | 10,6 | 11,1 | 12,0 | 13,6 | 13,9 | 15,4 | 15,7 | 17,4 | 19,6 |
| 5 | 11,6 | 12,2 | 13,2 | 15,0 | 15,3 | 17,0 | 17,5 | 19,4 | 21,8 |
| 6 | 12,5 | 13,2 | 14,3 | 16,2 | 16,6 | 18,5 | 19,0 | 21,1 | 23,7 |
| 7 | 13,2 | 14,0 | 15,2 | 17,3 | 17,7 | 19,8 | 20,3 | 22,6 | 25,5 |

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



RAMPING AND HELICAL INTERPOLATION

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



$$\phi d_i = \phi D_H - \phi D_c$$

| ϕD_c | Ramping | | | Helical Interpolation | | |
|------------|--------------------|-----------|-----------|-----------------------|-----------------|----------------|
| | Max Ramp a° | Max a_p | Min L_r | ϕD_{Hmin} | ϕD_{Hmax} | Max Pitch/Rev. |
| 32 | 1,25 | 1,5 | 68,7 | 49 | - | 1,16 |
| | | | | - | 57,6 | 1,50 |
| 35 | 1,1 | 1,5 | 78,1 | 55 | - | 1,20 |
| | | | | - | 63,6 | 1,50 |
| 40 | 0,85 | 1,5 | 101,1 | 65 | - | 1,16 |
| | | | | - | 73,6 | 1,50 |
| 50 | 0,6 | 1,5 | 143,2 | 85 | - | 1,15 |
| | | | | - | 93,6 | 1,43 |
| 52 | 0,55 | 1,5 | 156,3 | 89 | - | 1,11 |
| | | | | - | 97,6 | 1,37 |
| 63 | 0,45 | 1,5 | 191,0 | 111 | - | 1,18 |
| | | | | - | 119,6 | 1,39 |
| 66 | 0,4 | 1,5 | 214,9 | 117 | - | 1,11 |
| | | | | - | 125,6 | 1,30 |
| 80 | 0,3 | 1,5 | 286,5 | 145 | - | 1,06 |
| | | | | - | 153,6 | 1,21 |
| 100 | 0,25 | 1,5 | 343,8 | 185 | - | 1,16 |
| | | | | - | 193,6 | 1,28 |

Note: During helical interpolation do not exceed max Pitch.

(*) Down cutting is recommended, tool pass rotation should be counter-clockwise.

(*) In case of ramping and helical interpolation, apply 70% or less feed (fz) from recommended cutting conditions table.

TEST REPORTS

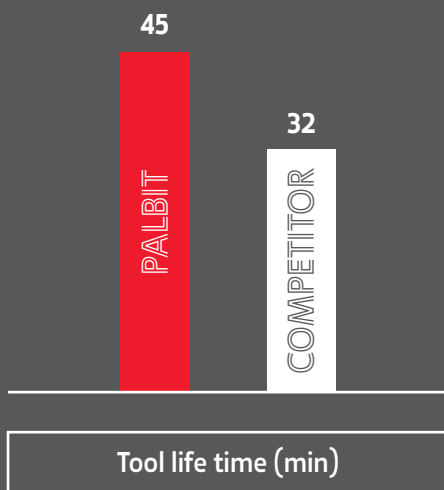
TETRAFEED 16320 - TEST REPORT

Toolholder: 032R16320-05-07-M16035

Insert: XNKU 06T310-MP

Grade: PHH930

**+40%
Tool Life
Time**



Workpiece material: stainless steel, AISI 316

| | |
|---------------------|-----------------------------------|
| Cutting speed: Vc | 120 m/min |
| Feed per tooth: fz | 1,0 mm/t |
| Depth of cut: ap | 0,5 mm |
| Width of cut: ae | 24 mm |
| Method of machining | Ramping and Helical Interpolation |
| Coolant | Dry |

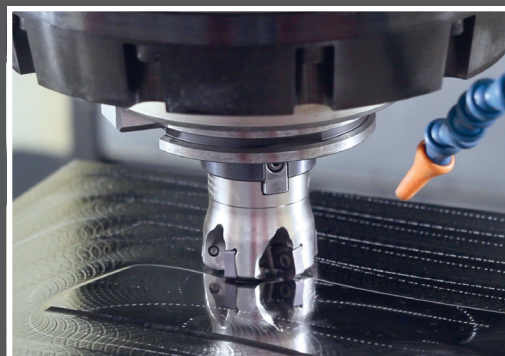
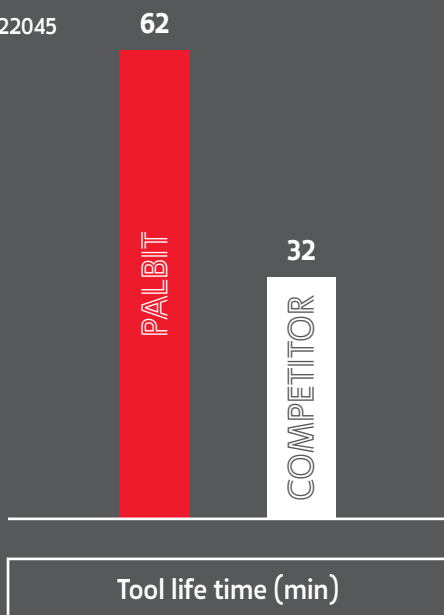
TETRAFEED 16420 - TEST REPORT

Toolholder: 050A16420-05-07-022045

Insert: XNKU 120516-MP

Grade: PHP920

**+94%
Tool Life
Time**



Workpiece material: 1.2738 | 34-36 HRC, Mould Steel

| | |
|----------------------|-----------|
| Cutting speed: Vc | 200 m/min |
| Feed per tooth: fz | 1,2 mm/t |
| Depth of cut: ap | 1,0 mm |
| Width of cut: ae | 60% |
| Method of machining: | Facing |
| Coolant | Air |



TETRAFEED
16320 | 16420

NEW

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