

### Arbor Mounting

$K_r = 44,5^\circ \sim 46^\circ$  |  $\gamma_p = -6^\circ$

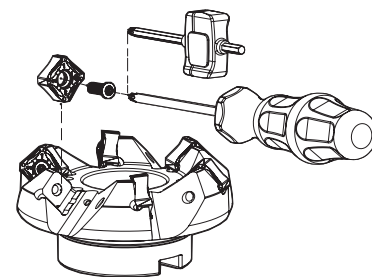
| Order code<br>Código | Reference<br>Referência<br>Referencia |    | Dimensions   Dimensões   Dimensiones (mm) |            |          |           |    | Kg     | Specifications |                   | Insert<br>Pastilha<br>Inserto | Stock |
|----------------------|---------------------------------------|----|---|------------|----------|-----------|----|--------|----------------|-------------------|-------------------------------|-------|
|                      |                                       |    | $\phi Dc$                                 | $\phi Dc2$ | $\phi d$ | $\phi dg$ | L  |        | Arbor<br>Type  | $A_p$ max<br>(mm) |                               |       |
| 181048200            | 050A90945-04-06-022040                | 4  | 50  | 63         | 22       | 48        | 40 | 0,424  | A              | 6,0               | SN... 1206                    |       |
| 181067000            | 050A90945-06-06-022040                | 6  | 50  | 63         | 22       | 48        | 40 | 0,415  | A              | 6,0               | SN... 1206                    |       |
| 181048300            | 063A90945-06-06-022040                | 6  | 63  | 76         | 22       | 52        | 40 | 0,575  | A              | 6,0               | SN... 1206                    |       |
| 181067100            | 063A90945-08-06-022040                | 8  | 63  | 76         | 22       | 52        | 40 | 0,577  | A              | 6,0               | SN... 1206                    |       |
| 181048400            | 080A90945-07-06-027050                | 7  | 80  | 93         | 27       | 60        | 50 | 0,966  | B              | 6,0               | SN... 1206                    |       |
| 181067200            | 080A90945-10-06-027050                | 10 | 80  | 93         | 27       | 60        | 50 | 0,950  | B              | 6,0               | SN... 1206                    |       |
| 181048500            | 100A90945-08-06-032050                | 8  | 100                                       | 113        | 32       | 80        | 50 | 1,667  | B              | 6,0               | SN... 1206                    |       |
| 181067300            | 100A90945-12-06-032050                | 12 | 100                                       | 113        | 32       | 80        | 50 | 1,650  | B              | 6,0               | SN... 1206                    |       |
| 181048600            | 125A90945-10-06-040063                | 10 | 125                                       | 138        | 40       | 90        | 63 | 2,890  | B              | 6,0               | SN... 1206                    |       |
| 181048700            | 160A90945-12-06-U040063               | 12 | 160                                       | 173        | 40       | 110       | 63 | 4,360  | C              | 6,0               | SN... 1206                    |       |
| 181052800            | 200A90945-14-06-U060063               | 14 | 200                                       | 213        | 60       | 172       | 63 | 8,890  | C              | 6,0               | SN... 1206                    |       |
| 181064700            | 250A90945-16-06-U060063               | 16 | 250                                       | 263        | 60       | 172       | 63 | 11,490 | C              | 6,0               | SN... 1206                    |       |

Stock item | Produto de stock | Itens de stock

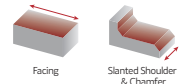
Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire página A-9)

## SPARE PARTS | Acessórios | Repuestos

| Cutter<br>$\phi Dc$ | Insert Screw | Key (Torx) | Order separately |              | Order separately |                 |
|---------------------|--------------|------------|------------------|--------------|------------------|-----------------|
|                     |              |            | Key (Torx - Nm)  | Torque Value | Screw            | DIN 6368 Wrench |
| A90945 - 50 - 63    | P0401200     | XT15       | DT1530           | 3,0          | -                | -               |
| A90945 - 80         | P0401200     | XT15       | DT1530           | 3,0          | J0123510         | SD6368-12       |
| A90945 - 100        | P0401200     | PT15       | DT1530           | 3,0          | J0164110         | SD6368-16       |
| A90945 - 125        | P0401200     | PT15       | DT1530           | 3,0          | J0204610         | SD6368-20       |
| A90945 - 160 - 250  | P0401200     | PT15       | DT1530           | 3,0          | -                | -               |



Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-241.  
Check the procedures for the clamping screws on the page A-241.

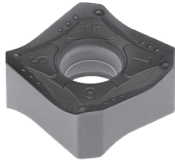


SNH(K)X 1206 | Inserts | Pastilhas | Plaquetas

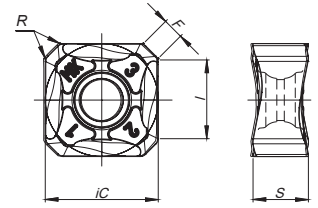
SNHX-LP



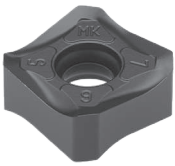
SNH(K)X-MP



SNH(K)X-MK | LP | MP | LN



SNH(K)X-MK



SNHX-LN

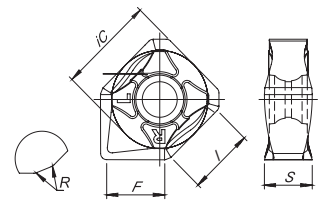


SNHX-W

4 Cutting edges (2R + 2L)



SNHX-W



| Geometry code | ISO Reference     | P   |    |     |    |    |    | M   |    | K   |    |    |     |    |    | N   |     | S  |    | Dimensions<br>Dimensões<br>Dimensiones (mm) |  |   |   |       |       |      |      |      |      |
|---------------|-------------------|-----|----|-----|----|----|----|-----|----|-----|----|----|-----|----|----|-----|-----|----|----|---|--|---|---|-------|-------|------|------|------|------|
|               |                   | CVD |    | PVD |    |    |    | PVD |    | CVD |    |    | PVD |    |    | UNC | PVD |    |    |   |  |   |   |       |       |      |      |      |      |
|               |                   | T9  | X5 | G4  | T1 | P3 | P4 | G6  | X9 | G6  | L5 | L6 | L9  | T9 | X5 | G4  | T1  | P3 | P4 |   |  |   |   |       | G6    | 10   | X9   | G6   |      |
| 1112293       | SNKX 1206 ANSN-MP | ⊗   |    |     | ⊗  |    |    | ⊗   |    |     |    |    | ⊗   | ⊗  |    | ⊗   | ⊗   |    |    | ⊗   |  |   | ⊗ |       | 12,70 | 6,35 | 9,30 | 0,80 | 2,00 |
| 1112249       | SNKX 1206 ANEN-MK |     |    |     |    |    |    |     |    | ⊗   | ⊗  | ⊗  |     |    |    |     |     |    |    |   |  |   |   |       | 12,70 | 6,35 | 9,30 | 0,80 | 2,00 |
| 1111452       | SNHX 1206 ANEN-LP |     |    |     | ⊗  |    | ⊗  | ⊗   |    |     |    |    |     |    |    | ⊗   | ⊗   |    |    | ⊗   |  | ⊗ |   | 12,70 | 6,35  | 9,30 | 0,80 | 2,00 |      |
| 1111502       | SNHX 1206 ANSN-MP | ⊗   | ⊗  | ⊗   | ⊗  |    | ⊗  |     |    |     |    |    | ⊗   | ⊗  |    | ⊗   | ⊗   |    |    | ⊗   |  | ⊗ |   | 12,70 | 6,35  | 9,30 | 0,80 | 2,00 |      |
| 1111503       | SNHX 1206 ANEN-MK |     |    |     |    |    |    |     |    | ⊗   |    | ⊗  |     | ⊗  | ⊗  | ⊗   | ⊗   |    |    |   |  |   |   | 12,70 | 6,35  | 9,30 | 0,80 | 2,00 |      |
| 1111504       | SNHX 1206 ANFN-LN |     |    |     |    |    |    |     |    |     |    |    |     |    |    |     |     |    |    | ⊗   |  |   |   | 12,70 | 6,35  | 9,30 | 0,80 | 2,00 |      |
| 1111899       | SNHX 1206 ANFN-W* |     | ⊗  |     | ⊗  |    |    |     |    |     |    |    |     |    |    | ⊗   | ⊗   |    |    |   |  |   |   | 12,70 | 6,30  | 9,30 | 0,40 | 7,60 |      |

⊗ First choice | 1ª Escolha | 1ª Opción    ⊗ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock    Insert Order Code: <sup>(1)</sup> Geometry code + <sup>(2)</sup> Grade code  
 ⊗ Stock Items | Itens de stock    ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

\* Wiper insert with 2 rights and 2 left-hand cutting edges.

A  
MILLING  
Overview  
Face milling  
Hifed milling  
Shoulder milling  
Profile milling  
Hardmill  
Center & Chamfer  
Spot face  
Spare Parts  
Technical Data  
End Mills

# PLUS 90945

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

| ISO | PSM | Material                          | HB (Brinell) | Vc (m/min)        |         |         |         |         |         |         |
|-----|-----|-----------------------------------|--------------|-------------------|---------|---------|---------|---------|---------|---------|
|     |     |                                   |              | ← Wear Resistance |         |         |         |         |         |         |
|     |     |                                   |              | PH0910            | PH5705  | PH5320  | PHP910  | PHP920  | PH7920  | PHP930  |
| P   | 1   | Unalloyed Steel                   | 125-220      | -                 | -       | -       | 180-250 | 180-250 | 180-240 | 160-220 |
|     | 2   | Low-Alloyed Steel                 | 220-280      | -                 | -       | -       | 160-240 | 160-230 | 160-220 | 140-200 |
|     | 3   | High-Alloyed Steel                | 280-380      | -                 | -       | -       | 140-230 | 140-220 | 140-210 | 120-190 |
| M   | 4   | SS - Ferritic / Martensitic       | 200-330      | -                 | -       | -       | -       | -       | 140-220 | 140-200 |
|     | 5   | SS - Austenitic                   | 200-330      | -                 | -       | -       | -       | -       | 130-180 | 120-160 |
|     | 6   | SS - Austenitic-ferritic (Duplex) | 230-260      | -                 | -       | -       | -       | -       | 120-160 | 100-140 |
| K   | 7   | Malleable Cast Iron               | 130-230      | -                 | 160-290 | 150-280 | 180-300 | 160-270 | 160-260 | 150-240 |
|     | 8   | Grey Cast Iron                    | 180-245      | -                 | 170-320 | 160-320 | 160-250 | 140-250 | 140-240 | 140-230 |
|     | 9   | Nodular Cast iron                 | 160-250      | -                 | 140-200 | 100-190 | 150-210 | 120-210 | 120-200 | 100-190 |
| N   | 10  | Aluminium and Non Ferrous         | 30-130       | 100-2000          | -       | -       | -       | -       | -       | -       |
| S   | 11  | Heat Resistant Super Alloys       | 200-320      | -                 | -       | -       | -       | -       | -       | 30-100  |

(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) PH5... and PHS... can be used wet or dry. PH7... use only air.

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

| ISO | PSM | Material                          | HB (Brinell) | Grades            |        |        |        |        |        |        |             |        |        |        |        |
|-----|-----|-----------------------------------|--------------|-------------------|--------|--------|--------|--------|--------|--------|-------------|--------|--------|--------|--------|
|     |     |                                   |              | ← Wear Resistance |        |        |        |        |        |        | Toughness → |        |        |        |        |
|     |     |                                   |              | PH0910            | PH5705 | PH5320 | PHP910 | PHP920 | PH7920 | PHP930 | PHH930      | PH7930 | PH5740 | PHS740 | 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      |                   | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |             | ✓      | ✓      |        | ✓      |
| N   | 10  | Aluminium and Non Ferrous         | 30-130       | ✓                 |        |        |        |        |        |        |             |        |        |        |        |
| S   | 11  | Heat Resistant Super Alloys       | 200-320      |                   |        |        |        |        |        |        | ✓           | ✓      |        |        | ✓      |

● Good Conditions

● Average Conditions

● Difficult Conditions

## 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      | SNHX 12... LP            | SNH(K)X 12... MP     |
|     | 2   | Low-Alloyed Steel                 | 220-280      | SNHX 12... LP            | SNH(K)X 12... MP     |
|     | 3   | High-Alloyed Steel                | 280-380      | SNH(K)X 12... MP         | -                    |
| M   | 4   | SS - Ferritic / Martensitic       | 200-330      | SNHX 12... LP            | -                    |
|     | 5   | SS - Austenitic                   | 200-330      | SNHX 12... LP            | -                    |
|     | 6   | SS - Austenitic-ferritic (Duplex) | 230-260      | SNHX 12... LP            | -                    |
| K   | 7   | Malleable Cast Iron               | 130-230      | SNH(K)X 12... MK         | -                    |
|     | 8   | Grey Cast Iron                    | 180-245      | SNH(K)X 12... MK         | -                    |
|     | 9   | Nodular Cast iron                 | 160-250      | SNH(K)X 12... MK         | -                    |
| N   | 10  | Aluminium and Non Ferrous         | 30-130       | SNHX 12... LN            | -                    |
| S   | 11  | Heat Resistant Super Alloys       | 200-320      | SNHX 12... LP            | -                    |

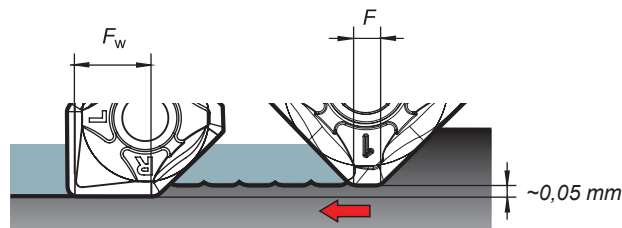


| Vc (m/min)  |         |         |         |         | Feed fz (mm/t) |                  |                  |               |              |
|-------------|---------|---------|---------|---------|----------------|------------------|------------------|---------------|--------------|
| Toughness → |         |         |         |         |                |                  |                  |               |              |
| PHH930      | PH7930  | PH5740  | PHS740  | PH7740  | SNHX 12... LP  | SNH(K)X 12... MP | SNH(K)X 12... MK | SNHX 12... LN | SNHX 12... W |
| -           | 160-220 | -       | 140-220 | 140-200 | 0,10-0,35      | 0,10-0,35        | -                | -             | 0,10-0,35    |
| -           | 140-200 | -       | 120-200 | 130-180 | 0,10-0,35      | 0,10-0,35        | -                | -             | 0,10-0,35    |
| -           | 120-190 | -       | 100-190 | 100-170 | 0,10-0,30      | 0,10-0,30        | -                | -             | 0,10-0,30    |
| 140-210     | 140-200 | -       | -       | 130-180 | 0,10-0,30      | -                | -                | -             | -            |
| 120-170     | 120-160 | -       | -       | 110-160 | 0,10-0,30      | -                | -                | -             | -            |
| 100-150     | 100-140 | -       | -       | 90-150  | 0,10-0,25      | -                | -                | -             | -            |
| -           | 150-240 | 160-260 | -       | 140-220 | 0,10-0,35      | -                | 0,10-0,35        | -             | 0,10-0,40    |
| -           | 140-230 | 140-240 | -       | 120-210 | 0,10-0,35      | -                | 0,10-0,35        | -             | 0,10-0,40    |
| -           | 100-190 | 120-200 | -       | 100-190 | 0,10-0,30      | -                | 0,10-0,30        | -             | 0,10-0,40    |
| -           | -       | -       | -       | -       | -              | -                | -                | 0,10-0,35     | -            |
| 30-110      | 30-100  | -       | -       | 30-100  | 0,07-0,20      | -                | -                | -             | -            |

## WIPER INSERTS

### Recommended Cutting Conditions:

- $f_n$  should be equal to  $0,8 \times F_w$
- Axial depth of cut is 0,5 to 0,8mm.



### Example:

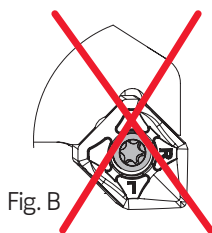
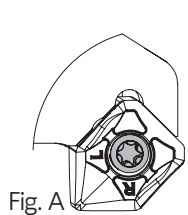
- The width of the parallel land (F) of the insert is 2mm.
- To obtain a good surface finishing, the feed per revolution should be a maximum of 80% of 2mm = 1,6mm.
- The wiper insert will have a parallel land ( $F_w$ ) with a width of 7,6mm.
- Result: Feed per revolution ( $f_n$ ) could be increased from 1,6mm to 6,1mm (80% of 7,6mm).

### Note:

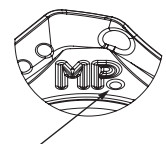
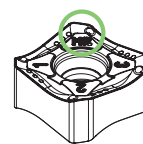
- Other limitations, such as machine power, must be taken into consideration.
- $f_n \leq 0,8 \times F_w = f_z \leq 0,8 \times F_w / Z$

### How to use a wiper insert:

- Since wiper is one corner use to standard cutters, please attach the insert with the parallel land down to the workpiece cutting surface.



When using wiper insert, install the insert as shown on Fig. A if the insert is installed as shown on Fig. B breakage of the insert is inevitable and normal surface finish can not be obtained.



This point shows the SNKX insert difference to SNHX

Put the same side of insert in each pocket for best radial and axial runout when using SNKX.

