

TN = TRIANGULAR 60° NEGATIVE

TRIANGULAR 60° NEGATIVA | TRIANGULAR 60° NEGATIVA

| | | | P | | | | | | | | M | | | | | | K | | | N | S | | | | | |
|---|-------------------------|----------------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | | | CVD-MT | | | | | | | | PVD | | CVD-MT | | | | | | PVD | | CVD-MT | | | UNC | PVD | |
| | | | new grades | | | | | | | | | | new grades | | | | | | | | | | | | | |
| | | | (2) Grade code | | | | | | | | | | (2) Grade code | | | | | | | | | | | | | |
| | | | L6 | T6 | L7 | R2 | L8 | R3 | L9 | V5 | G1 | G4 | L7 | U4 | L8 | U5 | L9 | V6 | G1 | G4 | L5 | L6 | L9 | 10 | G1 | G4 |
| Inserts Pastilhas Plaquetas | (1) Geometry code | ISO Reference | PH5320 | PHG105 | PH5115 | PHG115 | PH5125 | PHG125 | PH5740 | PHG140 | PH7910 | PH7920 | PH5115 | PHS215 | PH5125 | PHS225 | PH5740 | PHS240 | PH7910 | PH7920 | PH5705 | PH5320 | PH5740 | PH0910 | PH7910 | PH7920 |
|  <p>TNMG-MR Medium</p> | 1122000 | TNMG 160308-MR | | | ⊕ | ⊕ | ⊕ | ⊕ | | | | | | | | | | | | | | | | | | |
| | 1121281 | TNMG 160404-MR | | | ⊕ | ⊕ | ⊕ | ⊕ | ⊕ | ⊕ | | | | | | | | | | | | | | | | |
| | 1121269 | TNMG 160408-MR | | | ⊕ | ⊕ | ⊕ | ⊕ | ⊕ | ⊕ | | | | | | | | | | | | | | | | |
| | 1121282 | TNMG 160412-MR | | | ⊕ | ⊕ | ⊕ | ⊕ | ⊕ | ⊕ | | | | | | | | | | | | | | | | |
| | 1121562 | TNMG 160416-MR | | | | | | | ○ | ○ | | | | | | | | | | | | | | | | |
| | 1121625 | TNMG 220404-MR | | | ⊕ | ⊕ | ⊕ | ⊕ | ⊕ | ⊕ | | | | | | | | | | | | | | | | |
| | 1121305 | TNMG 220408-MR | | | ⊕ | ⊕ | ⊕ | ⊕ | ⊕ | ⊕ | | | | | | | | | | | | | | | | |
| | 1121307 | TNMG 220412-MR | | | ⊕ | ⊕ | ⊕ | ⊕ | ⊕ | ⊕ | | | | | | | | | | | | | | | | |
| 1121564 | TNMG 220416-MR | | | | | ⊕ | ⊕ | ⊕ | ⊕ | | | | | | | | | | | | | | | | | |
|  <p>TNMG-PM Medium</p> | 1123991 | TNMG 160404-PM | | ⊕ | | ⊕ | | ⊕ | | | | | | | | | | | | | | | | | | |
| | 1123917 | TNMG 160408-PM | | ⊕ | | ⊕ | | ⊕ | | | | | | | | | | | | | | | | | | |
| | 1123992 | TNMG 160412-PM | | ⊕ | | ⊕ | | ⊕ | | | | | | | | | | | | | | | | | | |
| | 1123993 | TNMG 160416-PM | | | | ⊕ | | ⊕ | | | | | | | | | | | | | | | | | | |
| | 1123922 | TNMG 220404-PM | | | | ⊕ | | ⊕ | | | | | | | | | | | | | | | | | | |
| | 1123923 | TNMG 220408-PM | | | | ⊕ | | ⊕ | | | | | | | | | | | | | | | | | | |
| | 1123994 | TNMG 220412-PM | | | | ⊕ | | ⊕ | | | | | | | | | | | | | | | | | | |
| 1123995 | TNMG 220416-PM | | | | ⊕ | | ⊕ | | | | | | | | | | | | | | | | | | | |
|  <p>TNMG-ST Medium</p> | 1121209 | TNMG 110304-ST | | | | | | | | | | | | | | | | | | | | ⊕ | | | | |
| | 1121210 | TNMG 110308-ST | | | | | | | | | | | | | | | | | | | | ⊕ | | | | |
| | 1121211 | TNMG 160304-ST | | | | | | | | | | | | | | | | | | | | ⊕ | | | | |
| | 1121212 | TNMG 160308-ST | | | | | | | | | | | | | | | | | | | | ⊕ | | | | |
| | 1121294 | TNMG 160404-ST | | | | | | | | | | | | | | | | | | | ⊕ | ⊕ | | | | |
| | 1121268 | TNMG 160408-ST | | | | | | | | | | | | | | | | | | | ⊕ | ⊕ | | | | |
| | 1121348 | TNMG 160412-ST | | | | | | | | | | | | | | | | | | | ⊕ | ⊕ | | | | |
| | 1121563 | TNMG 160416-ST | | | | | | | | | | | | | | | | | | | ⊕ | ⊕ | | | | |
| | 1121349 | TNMG 220404-ST | | | | | | | | | | | | | | | | | | | ⊕ | ⊕ | | | | |
| | 1121350 | TNMG 220408-ST | | | | | | | | | | | | | | | | | | | ⊕ | ⊕ | | | | |
| 1121354 | TNMG 220412-ST | | | | | | | | | | | | | | | | | | | ⊕ | ⊕ | | | | | |
| Automatic Lathes | 1121351 | TNMG 220416-ST | | | | | | | | | | | | | | | | | | | ⊕ | ⊕ | | | | |
| | 1121566 | TNMG 270608-ST | | | | | | | | | | | | | | | | | | | | ○ | | | | |
| | 1121569 | TNMG 270612-ST | | | | | | | | | | | | | | | | | | | | ○ | | | | |
| | 1121571 | TNMG 270616-ST | | | | | | | | | | | | | | | | | | | | ○ | | | | |
| | 1121572 | TNMG 330924-ST | | | | | | | | | | | | | | | | | | | | ○ | | | | |

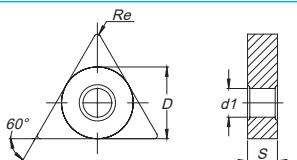
⊕ First choice | 1ª Escolha | 1ª Opción

⊕ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock

Insert Order Code: ⁽¹⁾ Geometry code + ⁽²⁾ Grade code

⊕ Stock Items | Itens de stock

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



| ISO Reference | ANSI Reference | Dimensions (mm) Dimensões (mm) Dimensiones (mm) | | | | Cutting Conditions Condições de Corte Condiciones de Corte | | | | | |
|----------------|----------------|---|------|------|------|--|------|-------|-------------|------|------|
| | | D | S | Re | d1 | ap (mm) | Min | Max | fn (mm/rev) | Min | Max |
| TNMG 160308-MR | TNMG 322-MR | 9,525 | 3,18 | 0,80 | 3,81 | 2,80 | 0,30 | 5,00 | 0,30 | 0,15 | 0,50 |
| TNMG 160404-MR | TNMG 331-MR | 9,525 | 4,76 | 0,40 | 3,81 | 3,00 | 0,40 | 5,00 | 0,20 | 0,10 | 0,30 |
| TNMG 160408-MR | TNMG 332-MR | 9,525 | 4,76 | 0,80 | 3,81 | 3,00 | 0,50 | 5,00 | 0,30 | 0,15 | 0,50 |
| TNMG 160412-MR | TNMG 333-MR | 9,525 | 4,76 | 1,20 | 3,81 | 3,00 | 0,80 | 5,00 | 0,35 | 0,18 | 0,60 |
| TNMG 160416-MR | TNMG 334-MR | 9,525 | 4,76 | 1,60 | 3,81 | 3,00 | 0,80 | 5,00 | 0,40 | 0,23 | 0,70 |
| TNMG 220404-MR | TNMG 431-MR | 12,700 | 4,76 | 0,40 | 5,16 | 4,00 | 0,40 | 6,60 | 0,20 | 0,10 | 0,30 |
| TNMG 220408-MR | TNMG 432-MR | 12,700 | 4,76 | 0,80 | 5,16 | 4,00 | 0,50 | 6,60 | 0,30 | 0,15 | 0,50 |
| TNMG 220412-MR | TNMG 433-MR | 12,700 | 4,76 | 1,20 | 5,16 | 4,00 | 0,80 | 6,60 | 0,35 | 0,18 | 0,60 |
| TNMG 220416-MR | TNMG 434-MR | 12,700 | 4,76 | 1,60 | 5,16 | 4,00 | 1,00 | 6,60 | 0,40 | 0,23 | 0,70 |
| TNMG 160404-PM | TNMG 331-PM | 9,525 | 4,76 | 0,40 | 3,81 | 3,00 | 0,40 | 5,00 | 0,20 | 0,10 | 0,30 |
| TNMG 160408-PM | TNMG 332-PM | 9,525 | 4,76 | 0,80 | 3,81 | 3,00 | 0,50 | 5,00 | 0,30 | 0,15 | 0,50 |
| TNMG 160412-PM | TNMG 333-PM | 9,525 | 4,76 | 1,20 | 3,81 | 3,00 | 0,80 | 5,00 | 0,35 | 0,18 | 0,60 |
| TNMG 160416-PM | TNMG 334-PM | 9,525 | 4,76 | 1,60 | 3,81 | 3,00 | 1,00 | 5,00 | 0,40 | 0,23 | 0,65 |
| TNMG 220404-PM | TNMG 431-PM | 12,700 | 4,76 | 0,40 | 5,16 | 4,00 | 0,40 | 6,60 | 0,20 | 0,10 | 0,30 |
| TNMG 220408-PM | TNMG 432-PM | 12,700 | 4,76 | 0,80 | 5,16 | 4,00 | 0,50 | 6,60 | 0,30 | 0,15 | 0,50 |
| TNMG 220412-PM | TNMG 433-PM | 12,700 | 4,76 | 1,20 | 5,16 | 4,00 | 0,80 | 6,60 | 0,35 | 0,18 | 0,60 |
| TNMG 220416-PM | TNMG 434-PM | 12,700 | 4,76 | 1,60 | 5,16 | 4,00 | 1,00 | 6,60 | 0,40 | 0,23 | 0,60 |
| TNMG 110304-ST | TNMG 221-ST | 6,350 | 3,18 | 0,40 | 2,26 | 2,00 | 0,15 | 4,50 | 0,22 | 0,15 | 0,30 |
| TNMG 110308-ST | TNMG 222-ST | 6,350 | 3,18 | 0,80 | 2,26 | 2,00 | 0,15 | 4,50 | 0,35 | 0,15 | 0,50 |
| TNMG 160304-ST | TNMG 321-ST | 9,525 | 3,18 | 0,40 | 3,81 | 3,00 | 0,20 | 5,50 | 0,22 | 0,15 | 0,30 |
| TNMG 160308-ST | TNMG 322-ST | 9,525 | 3,18 | 0,80 | 3,81 | 3,00 | 0,20 | 5,50 | 0,35 | 0,15 | 0,50 |
| TNMG 160404-ST | TNMG 331-ST | 9,525 | 4,76 | 0,40 | 3,81 | 3,00 | 0,20 | 5,50 | 0,22 | 0,15 | 0,30 |
| TNMG 160408-ST | TNMG 332-ST | 9,525 | 4,76 | 0,80 | 3,81 | 3,00 | 0,20 | 5,50 | 0,35 | 0,15 | 0,50 |
| TNMG 160412-ST | TNMG 333-ST | 9,525 | 4,76 | 1,20 | 3,81 | 3,00 | 0,30 | 5,50 | 0,40 | 0,15 | 0,60 |
| TNMG 160416-ST | TNMG 334-ST | 9,525 | 4,76 | 1,60 | 3,81 | 3,00 | 0,30 | 5,50 | 0,40 | 0,15 | 0,60 |
| TNMG 220404-ST | TNMG 431-ST | 12,700 | 4,76 | 0,40 | 5,16 | 4,00 | 0,20 | 8,00 | 0,22 | 0,15 | 0,30 |
| TNMG 220408-ST | TNMG 432-ST | 12,700 | 4,76 | 0,80 | 5,16 | 4,00 | 0,20 | 8,00 | 0,35 | 0,15 | 0,50 |
| TNMG 220412-ST | TNMG 433-ST | 12,700 | 4,76 | 1,20 | 5,16 | 4,00 | 0,30 | 8,00 | 0,40 | 0,15 | 0,60 |
| TNMG 220416-ST | TNMG 434-ST | 12,700 | 4,76 | 1,60 | 5,16 | 4,00 | 0,30 | 8,00 | 0,45 | 0,20 | 0,70 |
| TNMG 270608-ST | TNMG 542-ST | 15,875 | 6,35 | 0,80 | 6,35 | 4,40 | 0,30 | 8,80 | 0,35 | 0,15 | 0,50 |
| TNMG 270612-ST | TNMG 543-ST | 15,875 | 6,35 | 1,20 | 6,35 | 4,40 | 0,30 | 8,80 | 0,40 | 0,15 | 0,60 |
| TNMG 270616-ST | TNMG 544-ST | 15,875 | 6,35 | 1,60 | 6,35 | 4,40 | 0,30 | 8,80 | 0,45 | 0,20 | 0,70 |
| TNMG 330924-ST | TNMG 666-ST | 19,050 | 9,52 | 2,40 | 7,94 | 4,80 | 0,30 | 10,50 | 0,60 | 0,25 | 1,40 |

INSERTS RECOMENDATION

EXTERNAL MACHINING | MAQUINAÇÃO EXTERNA | MAQUINACIÓN EXTERNA

General Recommendation:

1. The choice of the insert shape depends of the operation
2. The insert shape should be selected to the required lead angle and the accessibility or versatility required of the tool.
3. Select the largest suitable point angle on the insert for strenght and economy.

| Operation | Longitudinal turning | Profiling | Facing | Plunging |
|-------------------|----------------------|-----------|--------|----------|
| Insert Shape | | | | |
| Rhombic 80° | ●● | | ● | |
| Rhombic 55° | ● | ●● | ● | |
| Parallelogram 55° | ● | ● | | ● |
| Round | ● | ● | ● | ●● |
| Square 90° | ● | | ●● | |
| Triangular 60° | ● | ● | ● | ● |
| Rhombic 35° | | ● | | |
| Trigon 80° | ● | | ● | |

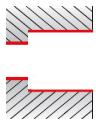
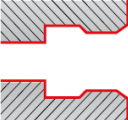

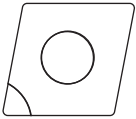
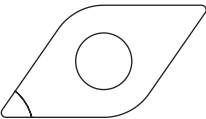

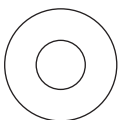
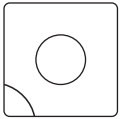
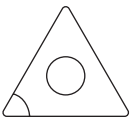
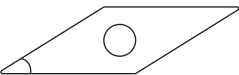

●● Recommended Insert Shape

● Alternative Insert Shape

INTERNAL MACHINING | MAQUINAÇÃO INTERNA | MAQUINACIÓN INTERNA

General Recommendation:

1. The choice of the insert shape depends of the operation
2. The insert shape should be selected to the required lead angle and the accessibility or versatility required of the tool.
3. Select the largest suitable point angle on the insert for strenght and economy.

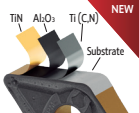
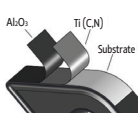
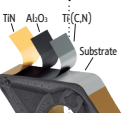
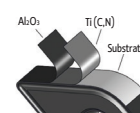
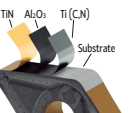
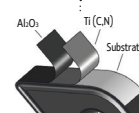
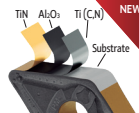
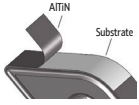
| Insert Shape | | Operation | | Longitudinal turning | Profiling | Facing |
|---|----------------------|-----------|----|---|--|---|
| | | | |  |  |  |
|  | Rhombic 80° | | ● | | | ●● |
|  | Rhombic 55° | | ● | | ●● | ● |
|  | Parallelogram 55° | | ●● | | | |
|  | Round | | ● | | | ● |
|  | Square 90° | | ● | | | |
|  | Triangular 60° | | ●● | | ● | ● |
|  | Rhombic 35° | | | | ● | |
|  | Trigon 80° | | ● | | | ● |

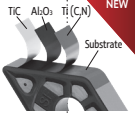
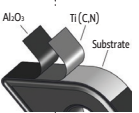
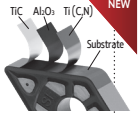
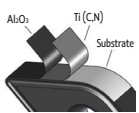
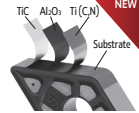
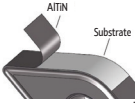
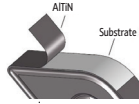
●● Recommended Insert Shape





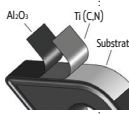
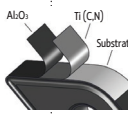
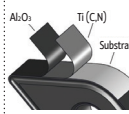
● Alternative Insert Shape

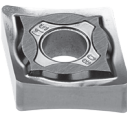

NEGATIVE TURNING Application Range Overview

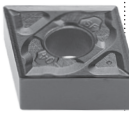


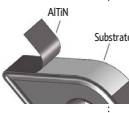
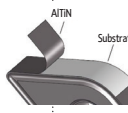
- TURNING
- Insert selection
- Overview
- Negative inserts
- Positive inserts
- PCD inserts
- Heavy machining
- External Toolholders
- Internal Toolholders
- Automatic Lathes
- Spare Parts
- Technical Data

| Fine finishing | | Finishing | | Medium | Roughing | Heavy roughing | |
|--|----|--|-------|---|----------|--|--------|
| P | MF | | LC | MR | HR | | |
| | | | | PM | RP | HY | |
| | | | | | | 1 face | 1 face |
| | | | | MW | | | HZ |
| | | | wiper | | | 1 face | |
| CVD Grades | | | | | | | |
|  <p>PHG105 (P05-P10)</p> | |  <p>PH5115 (P10-P25)</p> | |  <p>PHG115 (P10-P25)</p> | |  <p>PH5125 (P20-P35)</p> | |
| | | | |  <p>PHG125 (P20-P35)</p> | |  <p>PH5740 (P25-P45)</p> | |
| | | | | | |  <p>PHG140 (P25-P45)</p> | |
| PVD Grades | | | | | | | |
|  <p>PH7910 (P05-P10)</p> | | | | | | | |
| Continuous cut ← | | | | → Interrupted cut | | | |

| Fine finishing | | Finishing | | Medium | Roughing | Heavy roughing | | | |
|--|--|--|--|-------------------|---|----------------|--|--|--|
| MF | | SF | | SS | | | | | |
| | | MS | | | RP | HY | | | |
| | | | | | 1 face | 1 face | | | |
| M | CVD Grades | | | | | | | | |
| |  <p>PHS215 (M10-M25)</p> | |  <p>PH5125 (M15-M30)</p> | |  <p>PHS225 (M15-M30)</p> | |  <p>PH5740 (M25-M45)</p> | | |
| | | | | | | |  <p>PHS240 (M25-M45)</p> | | |
| | PVD Grades | | | | | | | | |
|  <p>PH7910 (M05-M10)</p> | |  <p>PH7920 (M10-M25)</p> | | | | | | | |
| Continuous cut ← | | | | → Interrupted cut | | | | | |

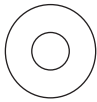
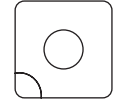
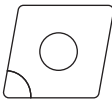

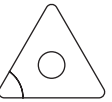
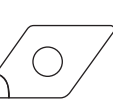
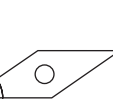
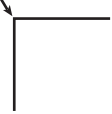



| K | Fine finishing | Finishing | Medium | Roughing | Heavy roughing |
|------------------------------------|----------------|--|---|--|--|
| | | | | ST  | FLAT  |
| | | | MW  | wiper | HZ  |
| CVD Grades | | | | | |
| | | PH5705 (K05-K15)  | PH5320 (K10-K25)  | PH5740 (K20-K40)  | |
| Continuous cut ← → Interrupted cut | | | | | |

| N | Fine finishing | Finishing | Medium | Roughing | Heavy roughing |
|------------------------------------|----------------|--|--------|--|----------------|
| | | | | MS  | |
| Uncoated Grades | | | | | |
| | | PH0910 (N01-N20)  | | | |
| Continuous cut ← → Interrupted cut | | | | | |

| S | Fine finishing | Finishing | Medium | Roughing | Heavy roughing |
|------------------------------------|----------------|--|---|---|----------------|
| | | | SF  | SS  | |
| | | MS  | | | |
| PVD Grades | | | | | |
| | | PH7910 (S05-S10)  | PH7920 (S10-S25)  | | |
| Continuous cut ← → Interrupted cut | | | | | |

INSERT SHAPE SELECTION

Seleção de geometria para pastilha | Selección de geometria para plaquita

| Shape angle | | 90° | 80° | 80° | 60° | 55° | 35° | |
|-----------------------|---|---|---|---|--|---|---|---|
| Geometry shape code | R | S | C | W | T | D | V | |
| Geometry shape design |  |  |  |  |  |  |  | |
| Cutting edge strength |  | | | | | | | Accessibility  |
| Vibration tendency |  | | | | | | | Less power consumption Pc (kW)  |

INSERT SHAPE

The insert shape should be selected relative to the entering angle accessibility from tools requirements.

The largest possible nose angle should be selected to provide insert strength and reliability, however, this has to be balanced against the cut variation need to be performed.

A large nose angle is strong, but requires more machine power and has a higher tendency for vibration.

A small nose angle is weaker and has a small cutting edge engagement, both of which can make it more sensitive to the heat effects.

Scale 1: indicates the cutting edge strength. The inserts to the left have larger nose angles and are correspondingly stronger. The right hand inserts have better versatility and accessibility.

Scale 2: indicates that vibration tendencies increase to the left side, while power requirements decrease to the right.

CHIP BREAKER SPECIFICATIONS

NEGATIVES | NEGATIVAS | NEGATIVAS

| Insert Type | Application | Tolerance Class | Major field of Application | Geometry | Cutting Edge* | | Cutting Conditions** | | Available Shapes | | | | | | | | |
|-------------------------|--------------------|-----------------|----------------------------|----------|--------------------|--------------|---------------------------------|--------------------------|------------------|-------|-------|-------|-------|-------|-------|-------|--|
| | | | | | at the nose radius | at the flank | Feed F _n (mm/rev) | Depth of cut DOC (mm) | KN __ | CN __ | DN __ | RN __ | SN __ | TN __ | VN __ | WN __ | |
| | | | | | | | | | | | | | | | | | |
| Knux's | Finishing | U | P M K | 01 | | | 0,20 to 0,35 | 1,00 to 6,00 | | | | | | | | | |
| | Medium | U | P M K | 02 | | | 0,40 to 0,70 | 1,50 to 6,00 | | | | | | | | | |
| NEGATIVES - double side | Medium Finishing | M | P M | 01 | | | 0,12 to 0,50 | 1,00 to 6,50 | | | | | | | | | |
| | Roughing to Medium | M | P M | 02 | | | 0,14 to 0,50 | 0,70 to 5,00 | | | | | | | | | |
| | Medium Finishing | M | P M | 03 | | | 0,15 to 0,50 | 0,80 to 6,00 | | | | | | | | | |
| | Medium Finishing | M | P M | MF | | | 0,05 to 0,60 | 0,10 to 2,50 | | | | | | | | | |
| | Medium Finishing | M | M N S | MS | | | 0,10 to 0,80 | 0,20 to 4,50 | | | | | | | | | |
| | Medium Finishing | M | M S | SF | | | 0,10 to 0,55 | 0,60 to 3,00 | | | | | | | | | |
| | Medium Finishing | M | P | LC | | | 0,07 to 0,50 | 0,60 to 3,00 | | | | | | | | | |
| | Medium Finishing | M | K | ST | | | 0,10 to 0,50 | 0,15 to 10,50 | | | | | | | | | |
| | Medium Finishing | M | P | MR | | | 0,10 to 0,70 | 0,30 to 9,00 | | | | | | | | | |
| | Medium Finishing | M | P NEW | PM | | | 0,10 to 0,60 | 0,30 to 9,00 | | | | | | | | | |

* T-Land varies according to the IC (IC reference used: 12,7mm)

** Cutting Conditions varies according to the Insert shape, IC and Nose Radius

NEGATIVES | NEGATIVAS | NEGATIVAS

| Insert Type | Application | Tolerance Class | Major field of Application | Geometry | Cutting Edge* | | Cutting Conditions** | | Available Shapes | | | | | | | |
|-------------------------|-----------------------------|-----------------|----------------------------|-----------|--------------------|--------------|---------------------------------|--------------------------|------------------|-------|-------|-------|-------|-------|-------|-------|
| | | | | | at the nose radius | at the flank | Feed F _n (mm/rev) | Depth of cut DOC (mm) | KN __ | CN __ | DN __ | RN __ | SN __ | TN __ | VN __ | WN __ |
| | | | | | | | | | | | | | | | | |
| NEGATIVES - double side | Medium Finishing | M | K | Flat | | | 0,08 to 2,50 | 0,10 to 15,00 | | | | | | | | |
| | Medium Wiper | M | P M K | MW | | | 0,15 to 0,90 | 0,30 to 6,00 | | | | | | | | |
| | Roughing to Medium roughing | M | M S | SS | | | 0,10 to 1,00 | 0,30 to 8,50 | | | | | | | | |
| | Roughing | M | P M K | HR | | | 0,20 to 1,20 | 0,80 to 15,00 | | | | | | | | |
| NEGATIVES - Single side | Roughing | M | P M | NEW RP | | | 0,30 to 1,50 | 2,00 to 12,00 | | | | | | | | |
| | Heavy Roughing to Roughing | M | P M | HY | | | 0,35 to 1,60 | 2,00 to 15,00 | | | | | | | | |
| | Heavy Roughing | M | P K | HZ | | | 0,35 to 1,60 | 2,40 to 17,00 | | | | | | | | |

* T-Land varies according to the IC (IC reference used: 12,7mm)

** Cutting Conditions varies according to the Insert shape, IC and Nose Radius

TURNING GRADES | Graus de torneamento | Calidades para torneado

| | ISO | ANSI | Uncoated grades | Coated Grades | | | |
|----------------------------------|-----|------|-----------------|-----------------------|--------|--|--------|
| | | | | CVD | PVD | | |
| STEEL | P | 05 | | ^{NEW} PHG105 | | ↑ - Wear resistance - Resistência ao desgaste - Resistencia al desgaste | |
| | | 10 | | | | | |
| | | 15 | | PHG115 | PH5115 | | PH7910 |
| | | 20 | | | | | |
| | | 25 | | | | | |
| | 30 | | | PHG125 | PH5125 | PH7920 | |
| | 35 | | | | | | |
| | 40 | | | | | | |
| | 45 | | | | | | |
| | 50 | | | | | | |
| STAINLESS STEEL | M | 05 | | | | ↑ - Wear resistance - Resistência ao desgaste - Resistencia al desgaste | |
| | | 10 | | | | | |
| | | 15 | | | | | PH7910 |
| | | 20 | | | | | |
| | | 25 | | | | | |
| | 30 | | | | | PH7920 | |
| | 35 | | | | | | |
| | 40 | | | | | | |
| | 45 | | | | | | |
| | 50 | | | | | | |
| CAST IRON | K | 05 | | | | ↑ - Wear resistance - Resistência ao desgaste - Resistencia al desgaste | |
| | | 10 | | | | | |
| | | 15 | | | | | PH5740 |
| | | 20 | | | | | |
| | | 25 | | | | | |
| 30 | | | | | PH5320 | | |
| 35 | | | | | | | |
| ALUMINIUM & NON FERROUS | N | 05 | | | | ↑ - Wear resistance - Resistência ao desgaste - Resistencia al desgaste | |
| | | 10 | | | | | |
| | | 15 | | | | | PH0910 |
| | | 20 | | | | | |
| | | 25 | | | | | |
| 30 | | | | | PH0910 | | |
| 35 | | | | | | | |
| HEAT RESISTENT / TITANIUM ALLOYS | S | 05 | | | | ↑ - Wear resistance - Resistência ao desgaste - Resistencia al desgaste | |
| | | 10 | | | | | |
| | | 15 | | | | | PH7910 |
| | | 20 | | | | | |
| | | 25 | | | | | |
| | | 30 | | | | | |
| 35 | | | | | | | |

Position and grade symbols shape indicate the suitable field of application.

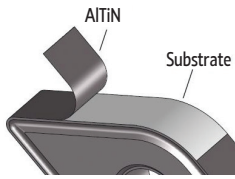
TURNING GRADES DESCRIPTION

Descrição de graus para torneamento | Descripción de calidades para torneado

PVD GRADES

PH7910

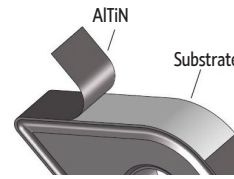
P05-P10
M05-M10
S05-S15



PVD (AlTiN) coated carbide grade with a very hard micro grain substrate improves wear resistance, heat dissipation and avoid built-up edge. High performance on “gummy” materials. For light turning of steels, hardened steels, stainless steels and HRSA.

PH7920

P10-P35
M10-M25
S10-S30

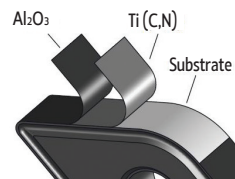


A micro grain size combined with the AlTiN PVD coating make it suitable for Roughing to Finishing operations under good cutting conditions to light interrupted cuts at medium cutting speeds. Suitable for steels, stainless steel, HRSA.

CVD GRADES

PH5115

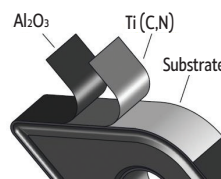
P10-P25
M10-M25



Medium temperature CVD coating with α - Al₂O₃. Carbide grade with a gradient layer close to the surface. Suitable for high to medium cutting speeds on steels & cast steels.

PH5125

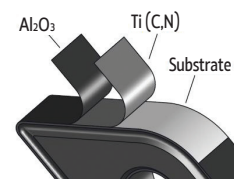
P20-P35
M15-M30



Carbide grade suitable for medium machining of steels & cast steels at medium cutting speeds. The substrate is suitable for the adhesion of the Alumina coating (α - Al₂O₃) medium temperature - CVD, improving the tool life.

PH5740

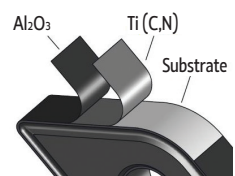
P25-P45
M25-M45
K20-K40



Substrate grade binary (Wc-Co) with medium grain size combined with the medium temperature CVD coating. Suitable for heavy roughing to roughing operations with interrupted cuts at medium to low cutting speeds.

PH5705

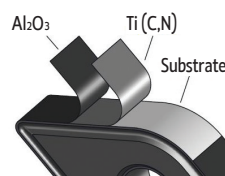
K05-K15



The substrate grade with a very good wear resistance combined with the MT-CVD coating allow to work at high to medium cutting speeds at stable conditions. Recommend for turning of grey cast irons (GCI) or hardened steels. Can also be a solution for high alloy steels.

PH5320

P01-P15
K10-K25



Medium temperature CVD coating (α - Al₂O₃) combined with a hard substrate make it capable of withstanding interrupted conditions. Recommended as general choice for roughing of all cast irons at low to medium cutting speeds. Can also be a solution for high alloy steels.

UNCOATED CARBIDE GRADE

PH0910

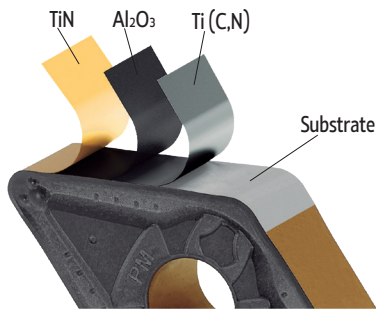
N01-N20



Uncoated carbide micrograin grade combining a good abrasive wear resistance and toughness. Suitable for rough to finish turning of HRSA, Titanium alloys, cast irons and Aluminium alloys.

TURNING GRADES DESCRIPTION

CVD GRADES



New CVD coating with Al_2O_3+TiN .



PHG105
P05-P10

First choice for continuous cut with hardness higher than 38HRC

New CVD coating with Al_2O_3+TiN combined with a very hard substrate.

PHG115
P10-P25

Suitable for high to medium cutting speeds on steels

New CVD coating with Al_2O_3+TiN .

PHG125
P20-P35

Ideal for general application in all kind of steels

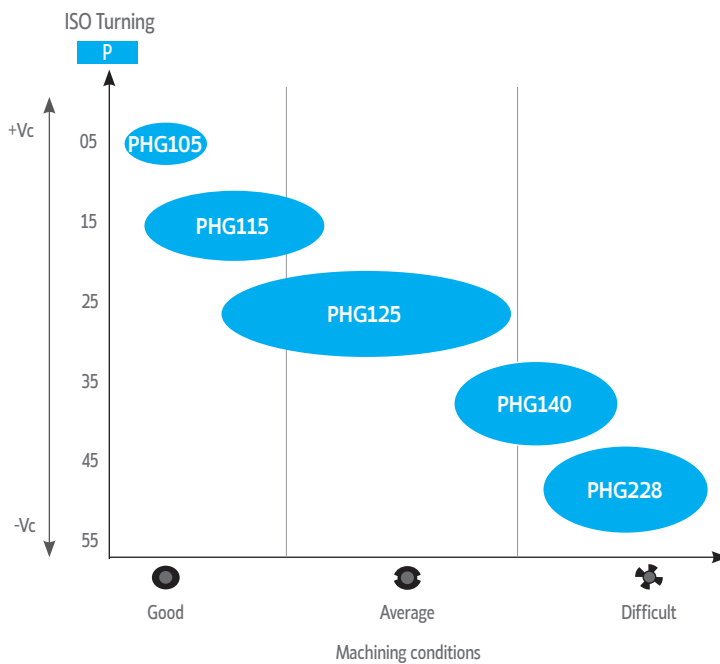
Carbide grade suitable for medium machining of steels at medium cutting speeds.

PHG140
P25-P45

First choice for roughing to heavy roughing operations with interrupted cut at medium to low cutting speeds

Binary substrate grade (Wc - Co) with medium grain size combined with a medium temperature CVD coating.

GRADES CHART | Gráfico de graus | Gráfico de calidades

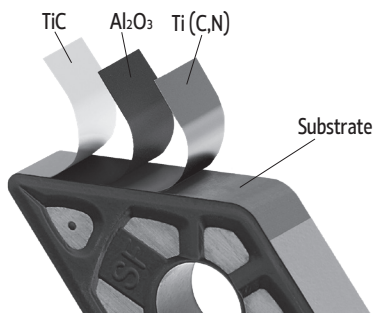


PHG228
P40-P50

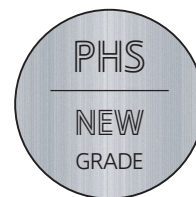
A very high toughness grade ideal for heavy roughing applications while using on large I.C inserts

New CVD coating with Al_2O_3+TiN .





New CVD coating with Al_2O_3+TiC .



Suitable for high to medium cutting speeds in stainless steel. Ideal for turning on good condition of cut (continuous cut)

New CVD coating with $TiCN+Al_2O_3+TiC$.



First choice for general application on turning of stainless steels

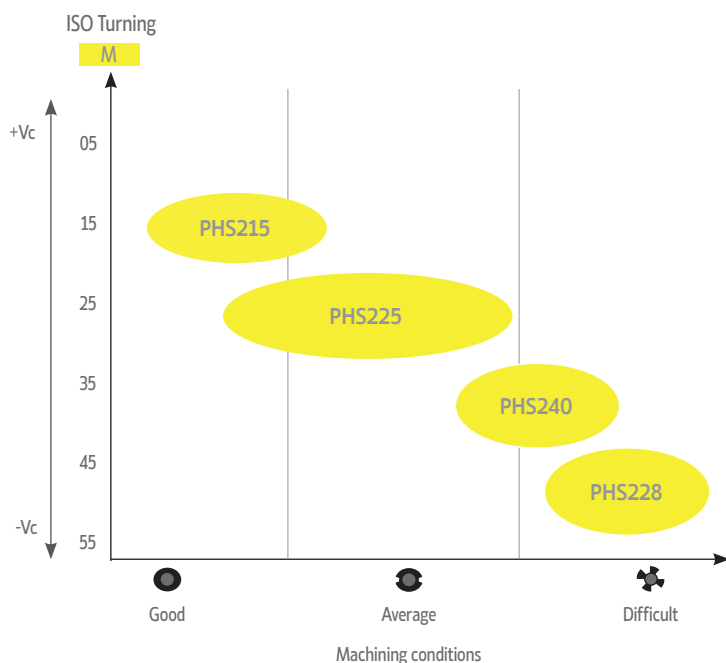
Carbide grade suitable for medium machining of stainless steels and super alloys at medium cutting speeds. New CVD coating with $TiCN+Al_2O_3+TiC$.



First choice for roughing to heavy roughing operations with interrupted cut at medium to low cutting speeds on stainless steel

New CVD coating with $TiCN+Al_2O_3+TiC$.

GRADES CHART || Gráfico de graus | Gráfico de calidades



A very high toughness grade ideal for heavy roughing applications while using on large I.C inserts

New CVD coating with $TiCN+Al_2O_3+TiC$.



SELECTION GUIDE (GRADES AND CHIP-BREAKERS) FOR NEGATIVE INSERTS

Guia De Seleção (Graus E Quebra-Aparas) para pastilhas negativas | Guía De Selección (Calidades Y Rompevirutas) para plaquitas negativas

SELECTION GUIDE FOR NEGATIVE INSERTS - SINGLE SIDE ...NMM'S

| ISO | Material workplace | Stability | Medium | | Roughing | | Medium roughing | | Insert | | | Holders |
|-----|--|-----------|--------------|------------------|--------------|------------------|-----------------|------------------|--------|-----------------------------|------|------------------------|
| | | | Chip-breaker | Grade | Chip-breaker | Grade | Chip-breaker | Grade | Type | | | Type |
| P | Unalloy steel HB 110 DIN C15 C45 | | RP | PH5125 PHG125 | RP | PH5125 PHG125 | HZ | PH5125 PHG125 | 0° | Conventional Nose Radius | #NMM | D##N M##N M##N-K |
| | | | RP | PH5125 PHG125 | HY | PH5125 PHG125 | HZ | PH5125 PHG125 | | | | |
| | | | RP | PH5125 PHG125 | HY | PH5740 PHG140 | HZ | PH5740 PHG140 | | | | |
| | Low Alloyed Steel HB180 DIN 21NiCrM02 36CrNiM04 | | RP | PH5125 PHG125 | RP | PH5125 PHG125 | HZ | PH5125 PHG125 | 0° | Conventional Nose Radius | #NMM | D##N M##N M##N-K |
| | | | RP | PH5125 PHG125 | HY | PH5125 PHG125 | HZ | PH5125 PHG125 | | | | |
| | | | RP | PH5125 PHG125 | HY | PH5125 PHG125 | HZ | PH5125 PHG125 | | | | |
| | High alloyed steel HB 200 DIN 34CrNiMo6 42CrMo4 | | RP | PH5125 PHG125 | RP | PH5125 PHG125 | HZ | PH5125 PHG125 | 0° | Conventional Nose Radius | #NMM | D##N M##N M##N-K |
| | | | RP | PH5125 PHG125 | HY | PH5125 PHG125 | HZ | PH5125 PHG125 | | | | |
| | | | RP | PH5125 PHG125 | HZ | PH5740 PHG140 | HZ | PH5740 PHG140 | | | | |
| | High alloyed steel HB 400 DIN X40CrMoV5 X45GrSi93 | | RP | PH5125 PHG125 | RP | PH5125 PHG125 | HZ | PH5125 PHG125 | 0° | Conventional Nose Radius | #NMM | D##N M##N M##N-K |
| | | | RP | PH5125 PHG125 | HY | PH5125 PHG125 | HZ | PH5125 PHG125 | | | | |
| | | | RP | PH5125 PHG125 | HZ | PH5125 PHG125 | HZ | PH5125 PHG125 | | | | |
| M | Ferritic/ martensitic stainless steel DIN X12CrMoS17 X6CrMo17 | | RP | PH5125 PHS225 | RP | PH5125 PHS225 | HY | PH5125 PHS225 | 0° | Conventional Nose Radius | #NMM | D##N M##N M##N-K |
| | | | RP | PH5125 PHS225 | HY | PH5125 PHS225 | HY | PH5125 PHS225 | | | | |
| | | | RP | PH5125 PHS225 | HY | PH5740 PHS240 | HY | PH5740 PHS240 | | | | |
| | Austenitic stainless steel DIN X5CrNi189 X5CrNiMo18 | | RP | PH5125 PHS225 | RP | PH5125 PHS225 | HS | PH5125 PHS225 | 0° | Conventional Nose Radius | #NMM | D##N M##N M##N-K |
| | | | RP | PH5125 PHS225 | RP | PH5125 PHS225 | HY | PH5125 PHS225 | | | | |
| | | | RP | PH5125 PHS225 | HY | PH5740 PHS240 | HY | PH5740 PHS240 | | | | |
| | Duplex stainless steel DIN X2CrNiMoSi19 X8CrNiMo27 | | RP | PH5125 PHS225 | RP | PH5125 PHS225 | HY | PH5125 PHS225 | 0° | Conventional Nose Radius | #NMM | D##N M##N M##N-K |
| | | | RP | PH5125 PHS225 | RP | PH5125 PHS225 | HY | PH5740 PHS240 | | | | |
| | | | RP | PH5125 PHS225 | HY | PH5740 PHS240 | HY | PH5740 PHS240 | | | | |
| K | Grey cast iron HB 220 DIN GG15 GG25 GG35 | | HZ | PH5320 | HZ | PH5320 | HY | PH5125 | 0° | Conventional Nose Radius | #NMM | D##N M##N M##N-K |
| | | | HZ | PH5320 | HZ | PH5320 | HY | PH5125 | | | | |
| | | | HZ | PH5740 | HZ | PH5740 | HY | PH5740 | | | | |
| | Nodular cast iron HB 180 DIN GGG40 GGG50 GGG70 | | HZ | PH5320 | HZ | PH5320 | HY | PH5125 | 0° | Conventional Nose Radius | #NMM | D##N M##N M##N-K |
| | | | HZ | PH5740 | HZ | PH5740 | HY | PH5125 | | | | |
| | | | HZ | PH5740 | HZ | PH5740 | HY | PH5740 | | | | |

Stable cutting

General cutting

Unstable cutting

TURNING
Insert selection
Overview
Negative inserts
Positive inserts
PCD inserts
Heavy machining
External Toolholders
Internal Toolholders
Automatic Lathes
Spare Parts
Technical Data

SELECTION GUIDE (GRADES AND CHIP-BREAKERS) FOR NEGATIVE INSERTS

SELECTION GUIDE FOR NEGATIVE INSERTS - DOUBLE SIDE ...NMG'S

| ISO | Material workplace | Stability | Medium | | Roughing | | Medium roughing | | Insert | | | Holders | |
|-----|---|------------------|--------------|--------------------------------------|--------------|------------------|-----------------|------------------|--------------------------|---------------------------------|--------------------------|--|--|
| | | | Chip-breaker | Grade | Chip-breaker | Grade | Chip-breaker | Grade | Type | | Type | | |
| P | Unalloyed steel HB 110 DIN C15 C45 C60 | | MF | PH5115 PHG115 | LC | PH5115 PHG115 | MR PM | PH5115 PHG115 | Negative double side | Conventional Nose Radius | #NMG | D##N M##N M##N-K P##N | |
| | | | MF | PH5115 PHG115 | LC | PH5125 PHG125 | MR PM | PH5125 PHG125 | | | | | |
| | | | MF | PH5125 PHG125 | LC | PH5125 PHG125 | MR | PH5125 PHG125 | 0° | | | | |
| | | | MW | PH5115 PHG115 | MW | PH5115 PHG115 | MW | PH5115 PHG115 | | | | | |
| | | | MW | PH5115 PHG115 | MW | PH5115 PHG115 | MW | PH5115 PHG115 | 0° | | Wiper Nose Radius | CNMG WNMG | D##N 95° M##N 95° M##N-K 95° P##N 95° |
| | | | MW | PH5125 PHG125 | MW | PH5125 PHG125 | MW | PH5125 PHG125 | | | | | |
| | Low alloyed Steel HB 180 DIN 21NiCrMo2 36CrNiMo4 34CrMo4 | | MF | PH7910 | MR PM | PH5115 PHG115 | HR | PH5115 PHG115 | Negative double side | Conventional Nose Radius | #NMG | D##N M##N M##N-K P##N | |
| | | | MF | PH5115 PHG115 | MR PM | PH5125 PHG125 | HR | PH5125 PHG125 | | | | | |
| | | | MF | PH5125 PHG125 | MR / PM | PH5125 PHG125 | HR | PH5125 PHG125 | 0° | | | | |
| | | | MW | PH5115 PHG115 | MW | PH5115 PHG115 | MW | PH5115 PHG115 | | | | | |
| | | | MW | PH5115 PHG115 | MW | PH5115 PHG115 | MW | PH5115 PHG115 | 0° | | Wiper Nose Radius | CNMG WNMG | D##N 95° M##N 95° M##N-K 95° P##N 95° |
| | | | MW | PH5125 PHG125 | MW | PH5125 PHG125 | MW | PH5125 PHG125 | | | | | |
| | High alloyed steel HB 200 DIN 34CrNiMo6 42CrMo4 | | MF | PH7910 | MR / PM | PH5115 PHG115 | HR | PH5115 PHG115 | Negative double side | Conventional Nose Radius | #NMG | D##N M##N M##N-K P##N | |
| | | | MF | PH5115 PHG115 | MR / PM | PH5125 PHG125 | HR | PH5125 PHG125 | | | | | |
| | | | MF | PH5125 PHG125 | MR / PM | PH5125 PHG125 | HR | PH5125 PHG125 | 0° | | | | |
| | | | MW | PH5115 PHG115 | MW | PH5115 PHG115 | MW | PH5115 PHG115 | | | | | |
| | | | MW | PH5115 PHG115 | MW | PH5115 PHG115 | MW | PH5115 PHG115 | 0° | | Wiper Nose Radius | CNMG WNMG | D##N 95° M##N 95° M##N-K 95° P##N 95° |
| | | | MW | PH5125 PHG125 | MW | PH5125 PHG125 | MW | PH5125 PHG125 | | | | | |
| | High alloyed steel HB 400 DIN X40CrMoV5 X45GrSi93 | | MF ST | PH7910 PH5705 | MR PM | PH5115 PHG115 | HR | PH5115 PHG115 | Negative double side | Conventional Nose Radius | #NMG | D##N M##N M##N-K P##N | |
| | | | MF ST | PH5115 PHG115 PH5320 PHG105 | MR PM | PH5115 PHG115 | HR | PH5115 PHG115 | | | | | |
| | | | MF | PH5115 PHG115 | MR PM | PH5125 PHG125 | HR | PH5125 PHG125 | 0° | | | | |
| | | | MW | PH5115 PHG115 | MW | PH5115 PHG115 | MW | PH5115 PHG115 | | | | | |
| | | | MW | PH5115 PHG115 | MW | PH5115 PHG115 | MW | PH5115 PHG115 | 0° | | Wiper Nose Radius | CNMG WNMG | D##N 95° M##N 95° M##N-K 95° P##N 95° |
| | | | MW | PH5115 PHG115 | MW | PH5115 PHG115 | MW | PH5125 PHG125 | | | | | |
| M | Ferritic/ martensitic stainless steel DIN X12CrMoS17 X6CrMo17 | | SF | PH7910 | SS | PH7910 | HR | PH5125 PHS225 | Negative double side | Conventional Nose Radius | #NMM | D##N M##N M##N-K | |
| | | | SF | PH7910 | SS | PH7910 | HR | PH5125 PHS225 | | | | | |
| | | | SF | PH7920 | SS | PH7920 | HR | PH5125 PHS225 | 0° | | | | |
| | | | MW | PHS215 | MW | PHS215 | - | - | | | | | |
| | | | MW | PHS215 | MW | PHS215 | - | - | 0° | | Wiper Nose Radius | CNMG WNMG | D##N 95° M##N 95° M##N-K 95° P##N 95° |
| | | | MW | PHS215 | MW | PHS215 | - | - | | | | | |
| | MW | PH5125 PHS225 | MW | PH5125 PHS225 | - | - | 0° | | | Wiper Nose Radius | DNMG TNMG | D##N 93° M##N 93° M##N-K 93° P##N 93° | |

Stable cutting

General cutting

Unstable cutting

DOUBLE SIDE ...NMG'S

| ISO | Material workplace | Stability | Medium | | Roughing | | Medium roughing | | Insert | | | Holders |
|-----|----------------------------|-----------|--------------|------------------|--------------|------------------|-----------------|------------------|----------------------|--------------------------|--------------|--|
| | | | Chip-breaker | Grade | Chip-breaker | Grade | Chip-breaker | Grade | Type | | | Type |
| M | Austenitic stainless steel | | SF | PH7910 | SS | PH7910 | HR | PH5125 PHS225 | Negative double side | Conventional Nose Radius | #NMG | D##N M##N M##N-K P##N |
| | | | SF | PH7910 | SS | PH7910 | HR | PH5125 PHS225 | | | | |
| | | | SF | PH7920 | SS | PH7920 | HR | PH5740 PHS240 | | | | |
| | | | MW | PHS215 | MW | PHS215 | - | - | Negative double side | Wiper Nose Radius | CNMG WNMG | D##N 95° M##N 95° M##N-K 95° P##N 95° |
| | | | MW | PHS215 | MW | PH5125 PHS225 | - | - | | | | |
| | | | MW | PH5125 PHS225 | MW | PH5740 PHS240 | - | - | | | | |
| | Duplex stainless steel | | SF | PH7910 | SS | PH7910 | HR | PH5125 PHS225 | Negative double side | Conventional Nose Radius | #NMG | D##N M##N M##N-K P##N |
| | | | SF | PH7920 | SS | PH7920 | HR | PH5125 PHS225 | | | | |
| | | | SF | PH7920 | SS HR | PH5740 PHS240 | HR | PH5740 PHS240 | | | | |
| | | | MW | PHS215 | - | - | - | - | Negative double side | Wiper Nose Radius | CNMG WNMG | D##N 95° M##N 95° M##N-K 95° P##N 95° |
| | | | - | - | - | - | - | - | | | | |
| | | | - | - | - | - | - | - | | | | |
| K | Grey cast iron | | Flat | PH5705 | Flat | PH5320 | HR | PH5705 | Negative double side | Conventional Nose Radius | #NMG | D##N M##N M##N-K P##N |
| | | | ST | PH5320 | ST | PH5705 | HR | PH5705 | | | | |
| | | | ST | PH5320 | ST | PH5320 | HR | PH5320 | | | | |
| | | | MW | PH5320 | MW | PH5320 | - | - | Negative double side | Wiper Nose Radius | CNMG WNMG | D##N 95° M##N 95° M##N-K 95° P##N 95° |
| | | | MW | PH5320 | MW | PH5320 | - | - | | | | |
| | | | MW | PH5320 | MW | PH5320 | - | - | | | | |
| | Nodular cast iron | | Flat | PH5705 | ST | PH5705 | HR | PH5705 | Negative double side | Conventional Nose Radius | #NMG | D##N M##N M##N-K P##N |
| | | | ST | PH5320 | ST | PH5320 | HR | PH5320 | | | | |
| | | | ST | PH5320 | ST | PH5320 | HR | PH5320 | | | | |
| | | | MW | PH5320 | MW | PH5320 | - | - | Negative double side | Wiper Nose Radius | CNMG WNMG | D##N 95° M##N 95° M##N-K 95° P##N 95° |
| | | | MW | PH5320 | MW | PH5320 | - | - | | | | |
| | | | MW | PH5320 | MW | PH5320 | - | - | | | | |
| S | Titanium Alloys | | SF | PH7920 | MS | PH7920 | SS | PH7920 | Negative double side | Conventional Nose Radius | #NMG | D##N M##N M##N-K P##N |
| | | | SF | PH7920 | MS | PH7920 | SS | PH7920 | | | | |
| | | | SF | PH7920 | MS | PH7920 | SS | PH7920 | | | | |

Stable cutting

General cutting

Unstable cutting

TURNING
Insert selection
Overview
Negative inserts
Positive inserts
PCD inserts
Heavy machining
External Toolholders
Internal Toolholders
Automatic Lathes
Spare Parts
Technical Data

SELECTION GUIDE (GRADES AND CHIP-BREAKERS) FOR NEGATIVE INSERTS

Guia De Seleção (Graus E Quebra-Aparas) para pastilhas negativas | Guía De Selección (Calidades Y Rompevirutas) para plaquitas negativas

DOUBLE SIDE ...NMG'S

| ISO | Material Workplace | Stability | Medium | | Roughing | | Medium roughing | | Insert | | | Holders |
|-----|--|-----------|--------------|--------|--------------|--------|-----------------|--------|--------|--|------|--------------------------------|
| | | | Chip-breaker | Grade | Chip-breaker | Grade | Chip-breaker | Grade | Type | | | Type |
| S | Super Alloys DIN NiCr19Co11MoTi NiFe35Cr14MoTi CoCr20W15Ni | | SF | PH7920 | MS | PH7920 | SS | PH7920 | 0° | | #NMG | D##N M##N M##N-K P##N |
| | | | SF | PH7920 | MS SS | PH7920 | SS | PH7920 | | | | |
| | | | SF | PH7920 | MS SS | PH7920 | SS | PH7920 | | | | |
| N | Aluminium Alloys DIN AW7075 AlSi12 CuZn37 | | MS | PH0910 | MS | PH0910 | - | - | 0° | | #NMG | D##N M##N M##N-K P##N |
| | | | MS | PH0910 | MS | PH0910 | - | - | | | | |
| | | | MS | PH0910 | MS | PH0910 | - | - | | | | |

Stable cutting General cutting Unstable cutting

SINGLE SIDE...CMT'S, BMT'S, CGT'S, RCMX'S, RCMT'S

| ISO | Material Workplace | Stability | Medium | | Roughing | | Medium roughing | | Insert | | | Holders | |
|-----|---|---|------------------|------------------|------------------|------------------|------------------|----------------------|----------------------|--------------------------|--------------------------|--------------|--------------|
| | | | Chip-breaker | Grade | Chip-breaker | Grade | Chip-breaker | Grade | Type | | | Type | |
| P | Unalloyed steel HB 110 DIN C15 C45 C60 | | FP | PH5115 PHG115 | MP | PH5115 PHG115 | MP | PH5115 PHG115 | | Conventional nose radius | #CMT #BMT | S##C S##B | |
| | | | FP | PH5115 PHG115 | MP | PH5125 PHG125 | MP | PH5125 PHG125 | | | | | |
| | | | FP | PH5125 PHG125 | MP | PH5125 PHG125 | MP | PH5125 PHG125 | | Wiper nose radius | CCMT | S##C 95° | |
| | | | FW | PH5115 PHG115 | MW | PH5115 PHG115 | - | - | | | | | |
| | | | FW | PH5115 PHG115 | MW | PH5115 PHG115 | - | - | | | DCMT TCMT | S##C 93° | |
| | | | FW | PH5115 PHG115 | MW | PH5115 PHG115 | - | - | | | | | |
| | | FP | PH5115 PHG115 | MP | PH5115 PHG115 | MP | PH5115 PHG115 | Positive single side | | | Conventional nose radius | #CMT #BMT | S##C S##B |
| | | FP | PH5115 PHG115 | MP | PH5125 PHG125 | MP | PH5125 PHG125 | | | | | | |
| | | FP | PH5125 PHG125 | MP | PH5125 PHG125 | MP | PH5125 PHG125 | | | | | | |
| | | FW | PH5115 PHG115 | MW | PH5115 PHG115 | - | - | Positive single side | Wiper nose radius | CCMT | S##C 95° | | |
| | | FW | PH5115 PHG115 | MW | PH5115 PHG115 | - | - | | | | | DCMT TCMT | S##C 93° |
| | | FW | PH5115 PHG115 | MW | PH5115 PHG115 | - | - | | | | | | |
| | | High alloyed Steel HB 200 DIN 34CrNiMo6 42CrMo4 | | FP | PH5115 PHG115 | MP | PH5115 PHG115 | MP | PH5115 PHG115 | Positive single side | Conventional nose radius | #CMT #BMT | S##C S##B |
| | | | FP | PH5115 PHG115 | MP | PH5125 PHG125 | MP | PH5125 PHG125 | | | | | |
| | | | FP | PH5125 PHG125 | MP | PH5125 PHG125 | MP | PH5125 PHG125 | | | | | |
| | | | FW | PH5115 PHG115 | MW | PH5115 PHG115 | - | - | Positive single side | Wiper nose radius | CCMT | S##C 95° | |
| | | | FW | PH5115 PHG115 | MW | PH5115 PHG115 | - | - | | | | | DCMT TCMT |
| | | | FW | PH5115 PHG115 | MW | PH5115 PHG115 | - | - | | | | | |

Stable cutting General cutting Unstable cutting

| ISO | Material | Grade fn (mm/r) HB (brinell) | CVD Coating | | | | | | | | | | | | | | | |
|-----------------|-----------------|---------------------------------------|-------------------|---------|---------|---------|---------|---------|-------------|---------|---------|-------------------|---------|---------|-------------|---------|---------|-----|
| | | | ← Wear Resistance | | | | | | | | | | | | Toughness → | | | |
| | | | PHG105 | | | PH5115 | | | PHG115 | | | PH5125 | | | PHG125 | | | |
| | | | 0.2 | 0.4 | 0.8 | 0.2 | 0.4 | 0.8 | 0.2 | 0.4 | 0.8 | 0.2 | 0.4 | 0.8 | 0.2 | 0.4 | 0.8 | |
| P | Unalloyed steel | 125-170 | 280-380 | 210-300 | 200-250 | 250-350 | 180-270 | 170-220 | 250-350 | 180-270 | 170-220 | 200-295 | 170-240 | 150-215 | 200-295 | 170-240 | 150-215 | |
| | Low-alloy steel | 180-350 | 220-280 | 200-260 | 170-210 | 190-250 | 170-230 | 140-180 | 190-250 | 170-230 | 140-180 | 170-230 | 140-210 | 120-190 | 170-230 | 140-210 | 120-190 | |
| | High-alloy stel | 200-325 | 165-250 | 150-235 | 140-230 | 135-220 | 120-205 | 110-200 | 135-220 | 120-205 | 110-200 | 125-215 | 110-185 | 100-170 | 125-215 | 110-185 | 100-170 | |
| | Material | Grade fn (mm/r) HB (brinell) | CVD Coating | | | | | | PVD Coating | | | | | | | | | |
| | | | ← Wear Resistance | | | | | | Toughness → | | | ← Wear Resistance | | | Toughness → | | | |
| | | | PHG140 | | | PH5740 | | | PH7910 | | | PH7920 | | | | | | |
| | | | | 0.2 | 0.4 | 0.8 | 0.2 | 0.4 | 0.8 | 0.2 | 0.4 | 0.8 | 0.2 | 0.4 | 0.8 | 0.2 | 0.4 | 0.8 |
| | Unalloyed steel | 125-170 | 135-230 | 120-210 | 115-200 | 135-230 | 120-210 | 115-200 | 140-245 | 130-225 | 115-220 | 130-230 | 120-220 | 110-210 | | | | |
| | Low-alloy steel | 180-350 | 125-205 | 105-185 | 95-185 | 125-205 | 105-185 | 95-185 | 130-230 | 125-225 | 125-215 | 125-220 | 115-210 | 100-200 | | | | |
| High-alloy stel | 200-325 | 105-205 | 75-175 | 50-135 | 105-205 | 75-175 | 50-135 | - | - | - | - | - | - | | | | | |

| ISO | Material | Grade fn (mm/r) HB (brinell) | CVD Coating | | | | | | | | | | | |
|-----------------------------------|-----------------------------------|---------------------------------------|-------------------|---------|---------|---------|---------|---------|-------------|---------|--------|-------------|---------|--------|
| | | | ← Wear Resistance | | | | | | | | | Toughness → | | |
| | | | PH5215 | | | PH5125 | | | PH5225 | | | PH5740 | | |
| | | | 0.2 | 0.4 | 0.6 | 0.2 | 0.4 | 0.6 | 0.2 | 0.4 | 0.6 | 0.2 | 0.4 | 0.6 |
| M | SS - Ferritic/martensitic | 200-330 | 125-260 | 100-220 | 80-200 | 110-230 | 70-175 | 50-135 | 110-230 | 70-175 | 50-135 | 85-180 | 65-160 | 45-135 |
| | SS - Austenitic | 180-330 | 130-290 | 100-240 | 80-190 | 100-240 | 70-175 | 55-130 | 100-240 | 70-175 | 55-130 | 85-170 | 65-145 | 45-125 |
| | SS - Austenitic-ferritic (Duplex) | 230-260 | 190-220 | 150-185 | 120-145 | 150-190 | 120-150 | 90-110 | 150-190 | 120-150 | 90-110 | 130-160 | 110-135 | 85-105 |
| | Material | Grade fn (mm/r) HB (brinell) | PVD Coating | | | | | | | | | | | |
| | | | ← Wear Resistance | | | | | | Toughness → | | | | | |
| | | | PH7910 | | | PH7920 | | | | | | | | |
| | | | | 0.2 | 0.4 | 0.6 | 0.2 | 0.4 | 0.6 | | | | | |
| | SS - Ferritic/martensitic | 200-330 | 128-230 | 120-220 | 115-215 | 133-235 | 130-225 | 120-220 | | | | | | |
| | SS - Austenitic | 180-330 | 124-225 | 115-215 | 105-205 | 129-223 | 125-220 | 115-215 | | | | | | |
| SS - Austenitic-ferritic (Duplex) | 230-260 | 121-212 | 110-205 | 100-195 | 125-216 | 115-210 | 100-200 | | | | | | | |

| ISO | Material | Grade fn (mm/r) HB (brinell) | CVD Coating | | | | | | | | |
|-----|-------------------|---------------------------------------|-------------------|---------|---------|---------|---------|---------|-------------|---------|---------|
| | | | ← Wear Resistance | | | | | | Toughness → | | |
| | | | PH5705 | | | PH5320 | | | PH5740 | | |
| | | | 0.2 | 0.4 | 0.6 | 0.2 | 0.4 | 0.6 | 0.2 | 0.4 | 0.6 |
| K | Marble cast iron | 130-230 | 160-360 | 140-280 | 120-235 | 150-330 | 130-240 | 110-220 | 110-230 | 100-215 | 100-190 |
| | Grey cast iron | 180-220 | 220-380 | 190-330 | 150-290 | 200-330 | 170-280 | 150-230 | 150-230 | 140-220 | 110-210 |
| | Nodular cast iron | 160-380 | 150-280 | 135-265 | 120-220 | 140-250 | 125-230 | 110-220 | 125-220 | 115-205 | 105-185 |

| ISO | Material | Grade fn (mm/r) HB (brinell) | Uncoated | |
|-----|--------------------------|---------------------------------------|----------|--------|
| | | | PH0910 | |
| | | | 0.15 | 0.8 |
| N | Aluminium alloys | 60-130 | 375-2400 | 40-240 |
| | Cooper and cooper alloys | 90-110 | 375-630 | 35-65 |

| ISO | Material | Grade fn (mm/r) HB (brinell) | PVD Coating | | | | | |
|-----|---|---------------------------------------|-------------------|--------|--------|-------------|--------|--------|
| | | | ← Wear Resistance | | | Toughness → | | |
| | | | PH7910 | | | PH7920 | | |
| | | | 0.1 | 0.3 | 0.5 | 0.1 | 0.3 | 0.5 |
| S | Heat resistant super alloys (Iron base) | 200-280 | 75-130 | 62-127 | 55-115 | 70-120 | 55-115 | 50-110 |
| | Heat resistant super alloys (Nickel base) | 250-320 | 55-95 | 40-90 | 33-85 | 35-80 | 27-75 | 23-70 |
| | Heat resistant super alloys (Cobalt base) | 200-320 | 55-95 | 40-90 | 33-85 | 35-80 | 27-75 | 23-70 |
| | Titanium alloys (400-or<1050[MPa]) | - | 80-172 | 70-162 | 65-155 | 65-152 | 50-145 | 45-135 |

ISO TURNING INSERTS CODE KEY

| | | | |
|---|--|---|---------|
| H | | M | |
| O | | V | |
| P | | W | |
| S | | L | |
| T | | A | |
| C | | B | |
| D | | K | |
| E | | R | |
| F | | X | Special |

1 - Insert shape symbol

| Symbol | m (mm) | d (mm) | s (mm) |
|--------|-------------|-------------|--------|
| A | ±0.005 | ±0.025 | ±0.025 |
| F | ±0.005 | ±0.013 | ±0.025 |
| C | ±0.013 | ±0.025 | ±0.025 |
| H | ±0.013 | ±0.013 | ±0.025 |
| E | ±0.025 | ±0.025 | ±0.025 |
| G | ±0.025 | ±0.025 | ±0.13 |
| J | ±0.005 | ±0.05~±0.13 | ±0.025 |
| K* | ±0.013 | ±0.05~±0.13 | ±0.025 |
| L* | ±0.025 | ±0.05~±0.13 | ±0.025 |
| M* | ±0.08~±0.20 | ±0.05~±0.13 | ±0.13 |
| N* | ±0.08~±0.20 | ±0.05~±0.13 | ±0.025 |
| U* | ±0.13~±0.38 | ±0.08~±0.25 | ±0.13 |

*As a rule, the sides of these inserts are as sintered. Tolerance differs with insert size, for the accuracy of class M, refer to the table on the right.

Triangular inserts with a facet (secondary cutting edge)

| Detailed dimension of M class insert Insert height Tolerances (mm) | | | | | |
|---|-------|-------|-------|-------|-------|
| Inscribed circle | T | S | C | D | V |
| 6.35 | ±0.08 | - | - | - | - |
| 9.525 | ±0.08 | ±0.08 | ±0.11 | ±0.10 | ±0.13 |
| 12.70 | ±0.13 | ±0.13 | ±0.13 | ±0.15 | - |
| 15.875 | ±0.15 | ±0.15 | ±0.15 | ±0.18 | - |
| 19.05 | ±0.15 | ±0.15 | ±0.15 | ±0.18 | - |
| 25.40 | - | ±0.18 | - | - | - |
| 31.75 | - | ±0.25 | - | - | - |

| Inscribed circle Tolerances (mm) | | | | | |
|----------------------------------|-------|-------|-------|-------|-------|
| Inscribed circle | T | S | C | D | V |
| 6.35 | ±0.05 | - | - | - | - |
| 9.525 | ±0.05 | ±0.05 | ±0.05 | ±0.05 | ±0.05 |
| 12.70 | ±0.08 | ±0.08 | ±0.08 | ±0.08 | ±0.08 |
| 15.875 | ±0.10 | ±0.10 | ±0.10 | ±0.10 | ±0.10 |
| 19.05 | - | - | - | - | ±0.10 |
| 25.40 | - | ±0.13 | - | - | ±0.10 |
| 31.75 | - | ±0.20 | - | - | ±0.12 |

3 - Tolerances symbol

| A | B | C | D | E |
|---|---|---|---|-----------------------|
| | | | | |
| F | G | N | P | O |
| | | | | Other clearance angle |

2 - Normal clearance symbol



| 4 - Insert symbol | | | | | | | | | | | | | | | |
|-------------------|-----------|---|---------------------------|-------|--------|-----------|---|-------------------------|---------------------------|--------|-----------|--------------|---------------------------|---------------------------|--|
| symbol | Type | Hole type | Chipbreaker | Shape | symbol | Type | Hole type | Chipbreaker | Shape | symbol | Type | Hole type | Chipbreaker | Shape | |
| W | with hole | Round hole / one countersink (40°-60°) | Without chipbreaker | | H | with hole | Round hole / one countersink (70°-90°) | Chipbreaker on one side | | G | with hole | Round hole | Chipbreaker on both sides | | |
| T | | | Chipbreaker on one side | | C | | Round hole / double countersink (70°-90°) | Without chipbreaker | | N | | - | Without chipbreaker | | |
| Q | | Round hole / double countersink (40°-60°) | Without chipbreaker | | J | | Round hole | Round hole | Chipbreaker on both sides | | R | without hole | - | Chipbreaker on one side | |
| U | | | Chipbreaker on both sides | | A | | | | Without chipbreaker | | F | | - | Chipbreaker on both sides | |
| B | | Round hole / one countersink (70°-90°) | Without chipbreaker | | M | | Chipbreaker on one side | | X | - | - | - | - | On request | |

| R's | 35° V's | 55° D's | 80° C's | 90° S's | 60° T's | 80° W's | Ø CI | | ANSI |
|------|------------|------------|------------|------------|------------|------------|--------|-------|--------|
| | | | | | | | mm | inch | Symbol |
| - | 06 | 04 | - | 03 | 06 | 02 | 3,97 | 5/32 | 1,20 |
| - | 08 | 05 | 04 | 04 | 08 | L3 | 4,76 | 3/16 | 1,50 |
| - | 09 | 06 | 05 | 05 | 09 | 03 | 5,56 | 7/32 | 1,80 |
| 06** | - | - | - | - | - | - | 6,00 | 0,236 | |
| 06* | 11 | 07 | 06 | 06 | 11 | 04 | 6,35 | 1/4 | 2,00 |
| 07* | 13 | 09 | 08 | 07 | 13 | 05 | 7,94 | 5/16 | 2,50 |
| 08* | - | - | - | - | - | - | 8,00 | 0,315 | |
| 09* | 16 | 11 | 09 | 09 | 16 | 06 | 9,525 | 3/8 | 3,00 |
| 10** | - | - | - | - | - | - | 10,00 | 0,394 | |
| 12** | - | - | - | - | - | - | 12,00 | 0,472 | |
| 12* | 22 | 15 | 12 | 12 | 22 | 08 | 12,70 | 1/2 | 4,00 |
| 15* | 27 | 19 | 16 | 15 | 27 | 10 | 15,875 | 5/8 | 5,00 |
| 16** | - | - | - | - | - | - | 16,00 | 0,63 | |
| 19* | 33 | 23 | 19 | 19 | 33 | 13 | 19,05 | 3/4 | 6,00 |
| 20** | - | - | - | - | - | - | 20,00 | 0,787 | |
| 25** | - | - | - | - | - | - | 25,00 | 0,984 | |
| 25* | 44 | 31 | 25 | 25 | 44 | 17 | 25,40 | 1,00 | 8,00 |
| 31* | 54 | 38 | 32 | 31 | 54 | 21 | 31,75 | 1 1/4 | 10,00 |
| 32** | - | - | - | - | - | - | 32,00 | 1,26 | |

5 - Insert size symbol

* ANSI designation only
(Radius Designation is R0)

** Metric designation only
(Radius Designation is M0)

According to International Standard ISO 1832 - 2012(E)

"Indexable inserts for cutting tools - Designation"

| ISO | mm | ANSI | inch |
|-----|-------|------|-------|
| 01 | 1.59 | 1 | 0.062 |
| T1 | 1.98 | 1.2 | 0.078 |
| 02 | 2.38 | 1.5 | 0.094 |
| 03 | 3.18 | 2 | 0.125 |
| T3 | 3.97 | 2.5 | 0.156 |
| 04 | 4.76 | 3 | 0.188 |
| 05 | 5.56 | 3.5 | 0.219 |
| 06 | 6.35 | 4 | 0.250 |
| 07 | 7.94 | 5 | 0.312 |
| 09 | 9.52 | 6 | 0.375 |
| 12 | 12.70 | 8 | 0.500 |

6 - Insert thickness symbol



| 7 - Insert corner symbol | | | |
|--------------------------|--------------|------|------|
| ISO | mm | inch | ANSI |
| 00 | Sharp nose | | 0 |
| 01 | 0.10 | .004 | 0.2 |
| 02 | 0.20 | .008 | 0.5 |
| 04 | 0.40 | .015 | 1 |
| 08 | 0.80 | .032 | 2 |
| 12 | 1.2 | .047 | 3 |
| 16 | 1.6 | .062 | 4 |
| 20 | 2.0 | .078 | 5 |
| 24 | 2.4 | .094 | 6 |
| 28 | 2.8 | .109 | 7 |
| 32 | 3.2 | .125 | 8 |
| 00 (inch or M0/metric) | Round insert | | 0 |

| 7.1* - Insert edges symbol | | | |
|---|---------|---|---------|
| For inserts having secondary edges two digits are used: | | | |
| 1 st digit is secondary edge | | 2 nd digit is secondary edges relief angle | |
| A | 45° | A | 3° |
| D | 60° | B | 5° |
| E | 75° | C | 7° |
| F | 85° | D | 15° |
| P | 90° | E | 20° |
| Z | special | F | 25° |
| *only when required. | | G | 30° |
| | | N | 0° |
| | | P | 11° |
| | | Z | special |

| POSITIVE Chipbreakers | 10 - Chipbreaker geometries | | | | | | | | |
|-----------------------|-----------------------------|----|----|----|----|----|----|----|----|
| | FLAT | FP | BO | FM | FK | FW | LM | MP | MM |
| | | | | | | | | | |
| | | | | | | | | | |

| NEGATIVE Chipbreakers | 10 - Chipbreaker geometries | | | | |
|-----------------------|-----------------------------|----|----|----|----|
| | FLAT | MF | SF | LC | MS |
| | | | | | |
| | | | | | |
| | | | | | |

| 8* - Cutting edge information | | |
|-------------------------------|-----------------------|--------|
| Shape | Honing | Symbol |
| | No honing | F |
| | With honing | E |
| | Chamfered No honing | T |
| | Chamfered with honing | S |

*only when required.

| 9* - Cutting direction | | |
|------------------------|-------|--------|
| Shape | Hand | Symbol |
| | Right | R |
| | Left | L |
| | None | N |

*only when required.