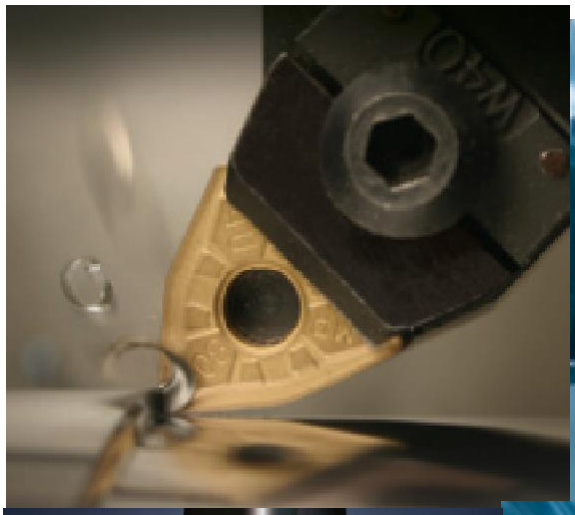
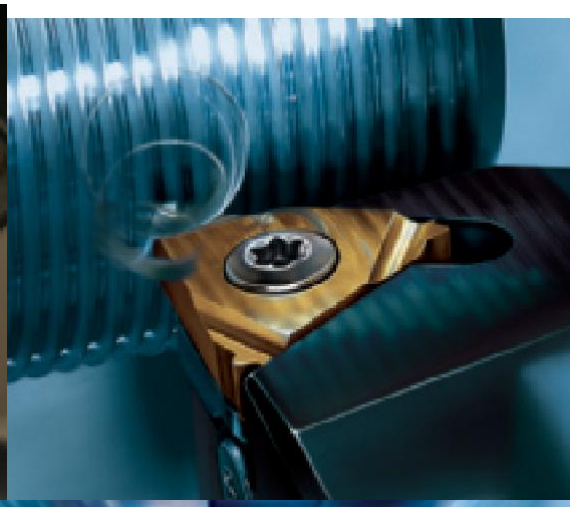
# HBILZ

# CUTTING TOOLS

## CATALOGO 2019









HBILZ tooling systems for all your turning requirements.

HBILZ Cutting tools

# Cutting Speed ($V_c$) metres/minute

| Cutting Speed ($V_c$) m/min | | | CVD Coated | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | Material | Rm and Hardness | A250 Max - min | | A5040 Max - min | | A04030 Max - min | | A07 Max - min | | A0400 Max - min | | A01519 Max - min | | A037 Max - min | |
| | | | HC Max - Min | | HC Max - Min | | HC Max - Min | | HC Max - Min | | HC Max - Min | | HC Max - Min | | HC Max - min | |
| P | Unalloyed Steels | <600 N/mm² <180HBN | 405 | 165 | 380 | 160 | 425 | 160 | 360 | 135 | 225 | 115 | - | - | 490 | 275 |
| | | <950 N/mm² <280HBN | 265 | 105 | 245 | 100 | 275 | 100 | 235 | 90 | 145 | 75 | - | - | 335 | 150 |
| | Alloyed Steels | 700-950 N/mm² 200-280 HBN | 240 | 95 | 230 | 95 | 250 | 95 | 215 | 80 | 135 | 70 | - | - | 215 | 125 |
| | | 950 - 1200 N/mm² 280 - 355 HBN | 220 | 90 | 200 | 85 | 215 | 85 | 195 | 75 | 125 | 65 | - | - | - | - |
| | | 1200 - 1400 N/mm² 355 - 415 HBN | 150 | 60 | 135 | 60 | 120 | 60 | 135 | 50 | 85 | 45 | - | - | - | - |
| M | Stainless Steels | Austenitic + Ferritic 300 series | 275 | 110 | 230 | 105 | - | - | 245 | 90 | 150 | 80 | - | - | 185 | 130 |
| | | Martensitic 400 series | 285 | 115 | 240 | 110 | - | - | 255 | 95 | 160 | 80 | - | - | 200 | 125 |
| | | Refractory P.H. | 145 | 60 | 120 | 60 | - | - | 130 | 50 | 80 | 40 | - | - | 150 | 100 |
| K | Cast Irons | Grey GG-Ft | 400 | 160 | 335 | - | - | - | - | - | 225 | 115 | 490 | 215 | 185 | 150 |
| | | Spheroidal-Ductile GGG-FGS | 350 | 140 | 290 | 135 | - | - | - | - | 195 | 100 | 425 | 185 | 275 | 170 |
| | | Malleable GTS - MN/MP | 235 | 95 | 195 | 90 | - | - | - | - | 130 | 70 | 285 | 125 | - | - |
| N | Aluminium & Alloys | < 16% Si116HBN | 475 | 190 | - | - | - | - | - | - | - | - | - | - | - | - |
| | | > 16% Si92HBN | 295 | 115 | - | - | - | - | - | - | - | - | - | - | - | - |
| S | High Temperature Alloys | Iron Based | 60 | 25 | 50 | 25 | - | - | 50 | 20 | 35 | 15 | - | - | - | - |
| | | Cobalt Based | 50 | 20 | 40 | 20 | - | - | 40 | 15 | 25 | 15 | - | - | - | - |
| | | Nickel Based | 50 | 20 | 45 | 20 | - | - | 45 | 15 | 30 | 15 | - | - | - | - |
| | | Titanium Based | 80 | 30 | 65 | 30 | - | - | 70 | 30 | 45 | 25 | - | - | - | - |
| H | Hard Steel | >1400 N/mm² >415 HBN | - | - | - | - | 65 | 45 | - | - | - | - | - | - | - | - |
| | Chilled Cast Iron | 1400 N/mm² 400 HBN | - | - | - | - | 60 | 45 | - | - | - | - | - | - | - | - |

## Star Guide  Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# Cutting Speed ($V_c$) metres/minute

| Cutting Speed ($V_c$) m/min | | | PVD Coated | | | | | | | | Uncoated | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | Material | Rm and Hardness | 751 Max - min | | 750 Max - min | | 752 Max - min | | 750S Max - min | | P21 Max - min | | PH1 micrograin Max - min | | PH2 micrograin Max - min | |
| | | | HC Max - Min | | HC Max - Min | | HC Max - Min | | HC Max - Min | | HW Max - Min | | HF Max - Min | | HF Max - Min | |
| P | Unalloyed Steels | <600 N/mm² <180HBN | - | - | 440 | 210 | 430 | 205 | 270 | 135 | - | - | - | - | - | - |
| | | <950 N/mm² <280HBN | - | - | 285 | 135 | 280 | 130 | - | - | - | - | - | - | - | - |
| | Alloyed Steels | 700 - 950 N/mm² 200 - 280 HBN | - | - | 265 | 125 | 255 | 120 | - | - | - | - | - | - | - | - |
| | | 950 - 1200 N/mm² 280 - 355 HBN | - | - | - | - | 235 | 110 | - | - | - | - | - | - | - | - |
| | | 1200 - 1400 N/mm² 355 - 415 HBN | - | - | - | - | 160 | 75 | - | - | - | - | - | - | - | - |
| M | Stainless Steels | Austenitic + Ferritic 300 series | 305 | 145 | 300 | 140 | 290 | 135 | - | - | 135 | 80 | 150 | 80 | 140 | 75 |
| | | Martensitic 400 series | 315 | 150 | 310 | 145 | 300 | 145 | - | - | - | - | 160 | 80 | - | - |
| | | Refractory P.H. | 165 | 75 | 160 | 75 | 155 | 75 | 100 | 50 | 75 | 40 | 80 | 40 | 75 | 40 |
| K | Cast Irons | Grey GG-Ft | 450 | 210 | 440 | 205 | 425 | 200 | - | - | 200 | 115 | 225 | 115 | - | - |
| | | Spheroidal-Ductile GGG-FGS | 385 | 180 | 380 | 180 | 365 | 175 | - | - | 175 | 100 | 195 | 100 | 175 | 100 |
| | | Malleable GTS - MN/MP | 260 | 120 | 255 | 120 | 250 | 115 | - | - | 115 | 70 | 130 | 70 | - | - |
| N | Aluminium & Alloys | < 16% Si116HBN | 1065 | 365 | 975 | 365 | 960 | 365 | 915 | 365 | 460 | 305 | 825 | 335 | - | - |
| | | > 16% Si92HBN | - | - | - | - | - | - | 610 | 245 | 215 | 150 | 550 | 185 | - | - |
| S | High Temperature Alloys | Iron Based | 65 | 30 | 65 | 30 | 60 | 30 | 40 | 20 | 30 | 20 | 35 | 15 | 30 | 15 |
| | | Cobalt Based | 55 | 25 | 50 | 25 | 50 | 25 | 30 | 15 | 25 | 15 | 25 | 15 | 25 | 15 |
| | | Nickel Based | 57 | 30 | 55 | 25 | 55 | 25 | 35 | 15 | 25 | 15 | 30 | 15 | 25 | 15 |
| | | Titanium Based | 90 | 40 | 90 | 40 | 85 | 40 | 55 | 30 | 40 | 25 | 45 | 25 | 40 | 20 |
| H | Hard Steel | >1400 N/mm² >415 HBN | 135 | 65 | - | - | 125 | 60 | - | - | - | - | - | - | - | - |
| | Chilled Cast Iron | 1400 N/mm² 400 HBN | 130 | 60 | - | - | 115 | 50 | - | - | - | - | - | - | - | - |

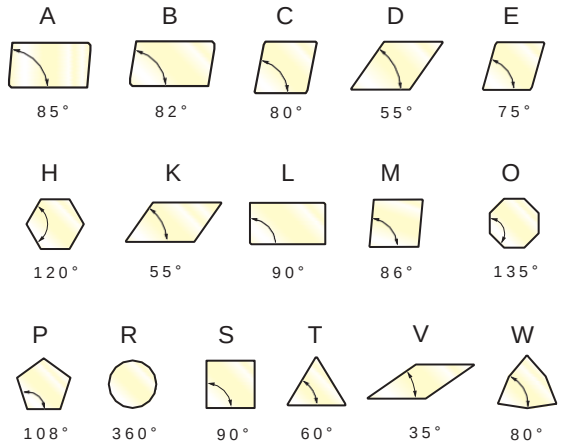
## Star Guide  Key to Recommended Inserts

| Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

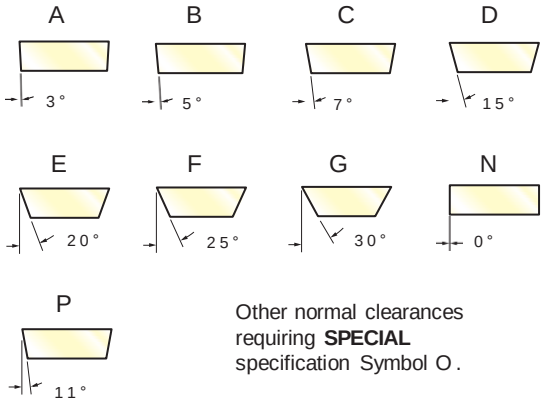
# ISO Insert Designation

| S | N | M | G | 12 |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

## 1 Shape

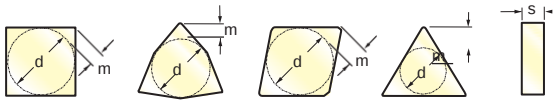



## 2 Clearance Angle




Other normal clearances requiring **SPECIAL** specification Symbol O.

## 3 Tolerance




| Class | | d | m | s |
|---|---|---|---|---|
| **A** | mm | ±0,025 | ±0,005 | ±0,025 |
| **C** | mm | ±0,025 | ±0,013 | ±0,025 |
| **E** | mm | ±0,025 | ±0,025 | ±0,025 |
| **F** | mm | ±0,013 | ±0,005 | ±0,025 |
| **G** | mm | ±0,025 | ±0,025 | ±0,13 |
| **H** | mm | ±0,013 | ±0,013 | ±0,025 |
| **J** | mm | * | ±0,005 | ±0,025 |
| **K** | mm | * | ±0,013 | ±0,025 |
| **L** | mm | * | ±0,025 | ±0,025 |
| **M** | mm | * | * | ±0,127 |
| **U** | mm | * | * | ±0,127 |
| **N** | mm | * | * | ±0,025 |

* See tables below.

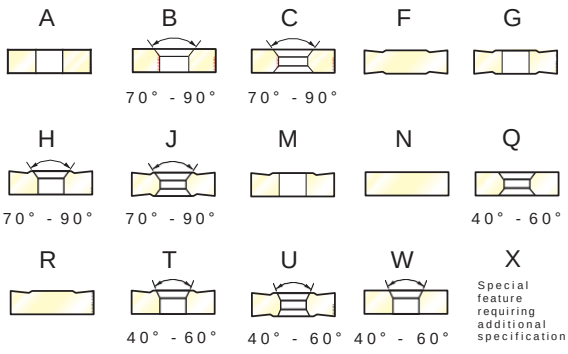
Valid for shapes: C, E, H, M, O, P, S, T, R, W

| IC | d | | m | |
|---|---|---|---|---|
| | J, K, L, M, N | U | M, N | U |
| 4,76 | ±0,05 | ±0,08 | ±0,08 | ±0,13 |
| 5,56 | ±0,05 | ±0,08 | ±0,08 | ±0,13 |
| 6 | ±0,05 | ±0,08 | ±0,08 | ±0,13 |
| 6,35 | ±0,05 | ±0,08 | ±0,08 | ±0,13 |
| 7,94 | ±0,05 | ±0,08 | ±0,08 | ±0,13 |
| 8 | ±0,05 | ±0,08 | ±0,08 | ±0,13 |
| 9,525 | ±0,05 | ±0,08 | ±0,08 | ±0,13 |
| 10 | ±0,05 | ±0,08 | ±0,08 | ±0,13 |
| 12 | ±0,08 | ±0,13 | ±0,13 | ±0,2 |
| 12,7 | ±0,08 | ±0,13 | ±0,13 | ±0,2 |
| 15,875 | ±0,1 | ±0,18 | ±0,15 | ±0,27 |
| 16 | ±0,1 | ±0,18 | ±0,15 | ±0,27 |
| 19,05 | ±0,1 | ±0,18 | ±0,15 | ±0,27 |
| 20 | ±0,1 | ±0,18 | ±0,15 | ±0,27 |
| 25 | ±0,13 | ±0,25 | ±0,18 | ±0,38 |
| 25,4 | ±0,13 | ±0,25 | ±0,18 | ±0,38 |
| 31,75 | ±0,15 | ±0,25 | ±0,2 | ±0,38 |
| 32 | ±0,15 | ±0,25 | ±0,2 | ±0,38 |

Valid for shape D only (**M** & **N** Tolerance)

| IC | d | m |
|---|---|---|
| 5,56 | ±0,05 | ±0,11 |
| 6,35 | ±0,05 | ±0,11 |
| 7,94 | ±0,05 | ±0,11 |
| 9,525 | ±0,05 | ±0,11 |
| 12,7 | ±0,08 | ±0,15 |
| 15,875 | ±0,10 | ±0,18 |
| 19,05 | ±0,10 | ±0,18 |

## 4 Type



# ISO Insert Designation

**04 08 E - 4T**

6 7 8 9

Integers to be preceded by a **0** (zero).
Disregard any decimals. e.g. 9,525 = **09**

C, D, E, M, V — H — A, B, K

L — O — P — R

S — T — W

Integers to be preceded by a 0 (zero) or the letter T.
Disregard any decimals.

A, B, C, N, O, W.

H, M, R, T.

F, G, J, U.

**Examples:**

| | | |
|---|---|---|
| **01** | = | 1,588 |
| **02** | = | 2,381 |
| **T3** | = | 3,969 |
| **05** | = | 5,556 |
| **06** | = | 6,350 |
| **07** | = | 7,938 |
| **09** | = | 9,525 |
| **11** | = | 11,113 |
| **14** | = | 14,288 |
| **15** | = | 15,875 |

**Inserts with wiper edges**

| Cutting edge Angle ($K_r$) 1st letter: | | | Wiper edge normal Clearance 2nd letter: ($a_n$) | | |
|---|---|---|---|---|---|
| **A** | = | 45° | **A** | = | 3° |
| **D** | = | 60° | **B** | = | 5° |
| **E** | = | 75° | **C** | = | 7° |
| **F** | = | 85° | **D** | = | 15° |
| **G** | = | 87° | **E** | = | 20° |
| **P** | = | 90° | **F** | = | 25° |
| **Z** | = | ANY OTHER | **G** | = | 30° |
| | | | **N** | = | 0° |
| | | | **P** | = | 11° |
| | | | **Z** | = | ANY OTHER |

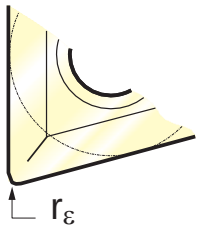
Major cutting edge
$K_r$
Chamfered corner
Wiper edge
Minor cutting edge

## 7 Corner *continued*

**Inserts with rounded corners.** The corner radius is indicated in 0,1mm. Integers to be preceded by a 0 (zero). If the corner is not rounded, use the symbol of designation 00 (zero zero).

**Examples:**

| | | | | | |
|---|---|---|---|---|---|
| **00** | = | SHARP CORNER | **24** | = | 2,4 |
| **01** | = | 0,1 | **28** | = | 2,8 |
| **02** | = | 0,2 | **32** | = | 3,2 |
| **04** | = | 0,4 | **40** | = | 4,0 |
| **08** | = | 0,8 | **48** | = | 4,8 |
| **12** | = | 1,2 | **56** | = | 5,6 |
| **16** | = | 1,6 | **64** | = | 6,4 |
| **20** | = | 2,0 | **X** | = | ANY OTHER |



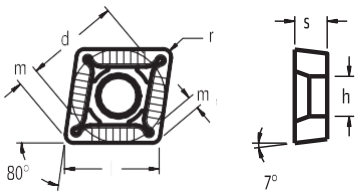

## 8 Edge Condition

| | Symbol |
|---|---|
| Sharp | **F** |
| Honed (Rounded) | **E** |
| Chamfered (Negative Land) | **T** |
| Chamfered + Honed | **S** |

## 9 Geometry Designation

1A, 2B, 2N, 3F, 3G, 3J, 3M, 4M, 4T, 4U, 5V, 91, 15, 61, 62, 64, 66, 73, 3G, M

# CCGT




| Dimensions for CCGT and CCMT | | | | | | | |
|---|---|---|---|---|---|---|---|
| Size | d<br>mm | l<br>mm | s<br>mm | r<br>mm | m<br>mm | $m_1$<br>mm | h<br>mm |
| 060200 | 6,35 | 6,45 | 2,38 | 0,00 | 1,75 | 0,12 | 2,80 |
| 060201 | 6,35 | 6,45 | 2,38 | 0,10 | 1,71 | 0,21 | 2,80 |
| 060202 | 6,35 | 6,45 | 2,38 | 0,20 | 1,65 | 0,30 | 2,80 |
| 060204 | 6,35 | 6,45 | 2,38 | 0,40 | 1,54 | 0,48 | 2,80 |
| 060208 | 6,35 | 6,45 | 2,38 | 0,80 | 1,32 | 0,72 | 2,80 |
| 09T300 | 9,52 | 9,57 | 3,97 | 0,00 | 2,63 | 1,45 | 4,40 |
| 09T301 | 9,52 | 9,57 | 3,97 | 0,10 | 2,59 | 1,42 | 4,40 |
| 09T302 | 9,52 | 9,57 | 3,97 | 0,20 | 2,53 | 1,39 | 4,40 |
| 09T304 | 9,52 | 9,57 | 3,97 | 0,40 | 2,42 | 1,33 | 4,40 |
| 09T308 | 9,52 | 9,57 | 3,97 | 0,80 | 2,20 | 1,21 | 4,40 |
| 120404 | 12,70 | 12,90 | 4,76 | 0,40 | 3,31 | 1,31 | 5,50 |
| 120408 | 12,70 | 12,90 | 4,76 | 0,80 | 3,08 | 1,69 | 5,50 |

## 62 Geometry

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| CCGT060200E-62 | | | | | | | | | | | | | | | | |
| CCGT060201E-62 | | | | | | | | | | | ◆ | | | | | |
| CCGT060202E-62 | | | | | | | | | | | ◆ | | | | | |
| CCGT060204E-62 | | | | | | | | | | | ◆ | | | | | |
| CCGT09T300E-62 | | | | | | | | | | | | | | | | |
| CCGT09T301E-62 | | | | | | | | | | | | | | | | |
| CCGT09T302E-62 | | | | | | | | | | | ◆ | | | | | |
| CCGT09T304E-62 | | | | | | | | | | | ◆ | | | | | |
| CCGT09T308E-62 | | | | | | | | | | | ◆ | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |



Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

## 73 Geometry



| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| CCMT060202E-73 | | ◆◆ | | | | | | | | | | | | | | |
| CCMT060204E-73 | ◆◆ | ◆◆ | | ◆◆ | ◆◆ | | | | | | | | | | | |
| CCMT060208E-73 | | ◆◆ | | | ◆◆ | | | | | | | | | | | |
| CCMT09T304E-73 | ◆◆ | ◆◆ | | ◆◆ | ◆◆ | | | | | | | | | | | |
| CCMT09T308E-73 | ◆◆ | ◆◆ | | | ◆◆ | | | | | | | | | | | |
| CCMT120404E-73 | | ◆◆ | | | ◆◆ | | | | | | | | | | | |
| CCMT120408E-73 | ◆◆ | ◆◆ | | | ◆◆ | | | | | | | | | | | |

## 3G Geometry

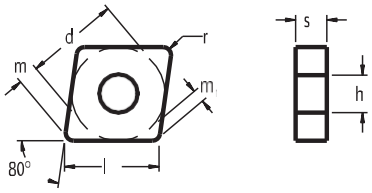


| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CCMT060202E-3G | | | | | | | ◆◆ | | | | | | | | | |
| CCMT060204E-3G | | | | ◆◆ | | | ◆◆ | | | | | | | | | |
| CCMT060208E-3G | | | | | ◆◆ | | ◆◆ | | | | | | | | | |
| CCMT09T302E-3G | | | | | | | ◆◆ | | | | | | | | | |
| CCMT09T304E-3G | | | | ◆◆ | ◆◆ | | ◆◆ | | | | | | | | | |
| CCMT09T308E-3G | | | ◆◆ | ◆◆ | ◆◆ | | ◆◆ | | | | | | | | | |
| CCMT120408E-3G | | | | | ◆◆ | | ◆◆ | | | | | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |




| Dimensions for CNGG, CNMA, CNMG and CNMM | | | | | | | |
|---|---|---|---|---|---|---|---|
| Size | d mm | l mm | s mm | r mm | m mm | $m_1$ mm | h mm |
| 090308 | 9,52 | 9,57 | 3,18 | 0,80 | 2,20 | 1,21 | 3,81 |
| 120401 | 12,70 | 12,90 | 4,76 | 0,10 | 3,47 | 1,91 | 5,16 |
| 120402 | 12,70 | 12,90 | 4,76 | 0,20 | 3,42 | 1,88 | 5,16 |
| 120404 | 12,70 | 12,90 | 4,76 | 0,40 | 3,30 | 1,81 | 5,16 |
| 120408 | 12,70 | 12,90 | 4,76 | 0,80 | 3,08 | 1,69 | 5,16 |
| 120412 | 12,70 | 12,90 | 4,76 | 1,20 | 2,86 | 1,57 | 5,16 |
| 120416 | 12,70 | 12,90 | 4,76 | 1,60 | 2,64 | 1,45 | 5,16 |
| 160608 | 15,88 | 16,10 | 6,35 | 0,80 | 3,97 | 2,18 | 6,35 |
| 160612 | 15,88 | 16,10 | 6,35 | 1,20 | 3,74 | 2,06 | 6,35 |
| 160616 | 15,88 | 16,10 | 6,35 | 1,60 | 3,52 | 1,94 | 6,35 |
| 160632 | 15,88 | 16,10 | 6,35 | 3,20 | 2,65 | 1,45 | 6,35 |
| 190608 | 19,05 | 19,40 | 6,35 | 0,80 | 4,85 | 2,66 | 7,92 |
| 190612 | 19,05 | 19,40 | 6,35 | 1,20 | 4,63 | 2,54 | 7,92 |
| 190616 | 19,05 | 19,40 | 6,35 | 1,60 | 4,41 | 2,42 | 7,92 |
| 190632 | 19,05 | 19,40 | 6,35 | 3,20 | 3,53 | 1,94 | 7,92 |

## 3F Geometry

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| CNGG120401F-3F | | | | | | | | ◆◆ | | ◆◆ | | | | | | |
| CNGG120402F-3F | | | | | | | | ◆◆ | | ◆◆ | | | | | | |
| CNGG120404F-3F | | | | | | | | ◆◆ | | ◆◆ | | ◆◆ | | | | |
| CNGG120408F-3F | | | | | | | | ◆◆ | | ◆◆ | | ◆◆ | | | | |
| CNGG120412F-3F | | | | | | | | ◆◆ | | | | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

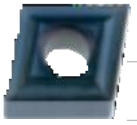
| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

## Flat Top

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| CNMA120404E | | | | | | ◆ | | | | | | | | | | |
| CNMA120408E | | | | | | ◆ | ◆ | | | | | | | | | |
| CNMA120412E | | | | | | ◆ | ◆ | | | | | | | | | |
| CNMA120416E | | | | | | ◆ | | | | | | | | | | |
| CNMA160612E | | | | | | ◆ | ◆ | | | | | | | | | |
| CNMA160632E | | | | | | ◆ | | | | | | | | | | |
| CNMA190612E | | | | | | ◆ | | | | | | | | | | |
| CNMA190616E | | | | | | ◆ | | | | | | | | | | |
| CNMA190632E | | | | | | ◆ | | | | | | | | | | |



## 91 Geometry



| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CNMG120404E-91 | | | | | | | | ◆ | | ◆ | | | | | | |
| CNMG120408E-91 | | | | | | | | ◆ | | ◆ | | | | | | |
| CNMG120412E-91 | | | | | | | | ◆ | | ◆ | | | | | | |

## 1A Geometry



| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CNMG120402E-1A | | | | | | | | | ◆ | | | | | | | |
| CNMG120404E-1A | ◆ | | | | | | | | ◆ | | ◆ | | | | | |
| CNMG120408E-1A | ◆ | | | | | | | | ◆ | | ◆ | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# CNMG

## 2B Geometry



| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| CNMG120404E-2B | | ◆◆◆ | | | ◆◆◆ | | ◆◆◆ | | ◆◆◆ | | | | | | | |
| CNMG120408E-2B | ◆◆◆ | ◆◆◆ | ◆◆◆ | ◆◆◆ | ◆◆◆ | | ◆◆◆ | | ◆◆◆ | | | | | ◆◆ | | |
| CNMG190612E-2B | ◆◆◆ | ◆◆◆ | ◆◆◆ | ◆◆◆ | ◆◆◆ | | ◆◆◆ | | ◆◆◆ | | | | | | | |

## 2N Geometry



| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CNMG090308E-2N | ◆◆◆ | | | | ◆◆◆ | | | ◆◆ | | | | | | | | |
| CNMG120404E-2N | ◆◆◆ | ◆◆◆ | | | ◆◆◆ | | | ◆◆◆ | | | | | | | | |
| CNMG120408E-2N | ◆◆◆ | ◆◆◆ | ◆◆ | | ◆◆◆ | | | ◆◆◆ | | | | | | ◆◆ | | |
| CNMG120412E-2N | ◆◆◆ | ◆◆◆ | | | ◆◆◆ | | | ◆◆◆ | | | | | | | | |
| CNMG160608E-2N | | | | | ◆◆◆ | | | | | | | | | | | |
| CNMG160612E-2N | | ◆◆◆ | | | ◆◆◆ | | | | | | | | | | | |
| CNMG190612E-2N | | ◆◆◆ | | | ◆◆◆ | | | | | | | | | | | |
| CNMG190616E-2N | | | | | ◆◆◆ | | | | | | | | | | | |

## 3G Geometry



| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CNMG120404E-3G | | | | | | | | ◆◆◆ | | ◆◆◆ | | | | | | |
| CNMG120408E-3G | ◆◆◆ | | | | | | | ◆◆◆ | | ◆◆◆ | | | | | | |
| CNMG120412E-3G | ◆◆◆ | | | | | | | ◆◆◆ | | ◆◆◆ | | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

## Star Guide — Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

## 3G Geometry *continued*

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| CNMG160608E-3G | | ◆ | | | | | ◆◆◆ | | | | | | | | | |
| CNMG160612E-3G | ◆◆ | | | | | | ◆◆◆ | | | | | | | | | |

## 3J Geometry

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CNMG120404E-3J | | ◆◆ | | ◆◆ | | | | | ◆◆ | | ◆◆ | | | | | |
| CNMG120408E-3J | | ◆◆ | | ◆◆ | | | | | ◆◆ | | ◆◆ | | | | | |
| CNMG120412E-3J | | | | ◆◆ | | | | | ◆◆ | | ◆◆ | | | | | |
| CNMG120416E-3J | | | | ◆◆ | | | | | | | ◆◆ | | | | | |
| CNMG160608E-3J | | | | | | | | | ◆◆ | | | | | | | |
| CNMG160612E-3J | | | | ◆◆ | | | | | ◆◆ | | | | | | | |
| CNMG190612E-3J | | | | ◆◆ | | | | | | | | | | | | |
| CNMG190616E-3J | | | | ◆◆ | | | | | | | | | | | | |

## 3M Geometry

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CNMG120408E-3M | ◆◆ | | | | | | | | ◆◆ | | ◆◆ | | | | | |
| CNMG120408E-3M | ◆◆ | | | | | | | | | | ◆◆ | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# CNMG

## 4T Geometry



| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| CNMG120404E-4T | | ◆◆◆ | | | ◆◆◆ | | ◆◆◆ | | ◆◆◆ | | | | | | | |
| CNMG120408E-4T | ◆◆◆ | ◆◆◆ | ◆◆◆ | ◆◆◆ | ◆◆◆ | | ◆◆◆ | | ◆◆◆ | | | | | ◆◆◆ | | |
| CNMG120412E-4T | ◆◆◆ | ◆◆◆ | ◆◆◆ | ◆◆◆ | ◆◆◆ | | ◆◆◆ | | ◆◆◆ | | | | | | | |
| CNMG120416E-4T | ◆◆◆ | ◆◆◆ | | ◆◆◆ | | | ◆◆◆ | | | | | | | | | |
| CNMG160608E-4T | | ◆◆◆ | | ◆◆◆ | | | ◆◆◆ | | ◆◆◆ | | | | | | | |
| CNMG160612E-4T | ◆◆◆ | ◆◆◆ | | ◆◆◆ | ◆◆◆ | | ◆◆◆ | | ◆◆◆ | | | | | ◆◆◆ | | |
| CNMG160616E-4T | ◆◆◆ | ◆◆◆ | | | ◆◆◆ | | | | | | | | | | | |
| CNMG190608E-4T | ◆◆◆ | ◆◆◆ | | ◆◆◆ | ◆◆◆ | | ◆◆◆ | | | | | | | | | |
| CNMG190612E-4T | ◆◆◆ | ◆◆◆ | | ◆◆◆ | ◆◆◆ | | ◆◆◆ | | | | | | | ◆◆◆ | | |
| CNMG190616E-4T | ◆◆◆ | ◆◆◆ | | | ◆◆◆ | | | | | | | | | ◆◆◆ | | |

## 4U Geometry



| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CNMG120408E-4U | | | ◆◆◆ | | | ◆ | | | | | | | | | | |
| CNMG120412E-4U | | | ◆◆◆ | | | ◆ | | | | | | | | | | |
| CNMG120416E-4U | | | | | | ◆ | | | | | | | | | | |
| CNMG160612E-4U | | | | | | ◆ | | | | | | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Iron | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# CNMG, CNMM

## 5V Geometry



| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| CNMG120408E-5V | | | | | | | ◆ | | | | | | | | | |
| CNMG120412E-5V | | | | | ◆ | | ◆ | | | | | | | | | |
| CNMG160616E-5V | | | | | | | | | | | | | | | | |
| CNMG190612E-5V | | | | | ◆ | | ◆ | | | | | | | | | |
| CNMG190616E-5V | | | | | ◆ | | | | | | | | | | | |

## 4M Geometry



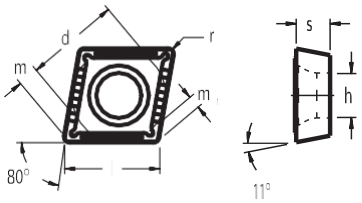
| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CNMM120408E-4M | | ◆ | | | | | | | | | | | | | | |
| CNMM190612E-4M | ◆ | ◆ | | | | | | | | | | | | | | |
| CNMM190616E-4M | | ◆ | | | | | | | | | | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

Indicates stocked item and material application range.

## Star Guide  Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# CPMT




| Dimensions for CPMT | | | | | | | |
|---|---|---|---|---|---|---|---|
| Size | d mm | l mm | s mm | r mm | m mm | $m_1$ mm | h mm |
| 060204 | 6,35 | 6,40 | 2,38 | 0,40 | 1,54 | 0,85 | 2,80 |

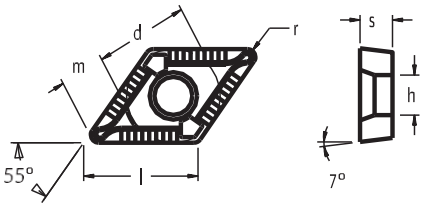
## 73 Geometry

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| CPMT060204E-73 | ◆ | | | | ◆ | | | | | | | | | | | |

◆ Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |




| Dimensions for DCGT, DCMT and DCMW | | | | | | | |
|---|---|---|---|---|---|---|---|
| Size | d<br>mm | l<br>mm | s<br>mm | r<br>mm | m<br>mm | $m_1$<br>mm | h<br>mm |
| 070200 | 6,35 | 7,70 | 2,38 | 0,00 | 3,67 | - | 2,79 |
| 070201 | 6,35 | 7,70 | 2,38 | 0,10 | 3,58 | - | 2,79 |
| 070202 | 6,35 | 7,70 | 2,38 | 0,20 | 3,46 | - | 2,79 |
| 070204 | 6,35 | 7,70 | 2,38 | 0,40 | 3,24 | - | 2,79 |
| 070208 | 6,35 | 7,70 | 2,38 | 0,80 | 2,78 | - | 2,79 |
| 11T301 | 9,52 | 11,60 | 3,97 | 0,10 | 5,43 | - | 4,39 |
| 11T302 | 9,52 | 11,60 | 3,97 | 0,20 | 5,33 | - | 4,39 |
| 11T304 | 9,52 | 11,60 | 3,97 | 0,40 | 5,09 | - | 4,39 |
| 11T308 | 9,52 | 11,60 | 3,97 | 0,80 | 4,62 | - | 4,39 |
| 11T312 | 9,52 | 11,60 | 3,97 | 1,20 | 4,16 | - | 4,39 |
| 150404 | 12,70 | 15,50 | 4,76 | 0,40 | 6,93 | - | 5,45 |
| 150408 | 12,70 | 15,50 | 4,76 | 0,80 | 6,47 | - | 5,45 |

## 62 Geometry

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| DCGT070200E-62 | | | | | | | | | | | ◆ | | | | | |
| DCGT070201E-62 | | | | | | | | | | | ◆ | | | | | |
| DCGT070202E-62 | | | | | | | | | | | ◆ | | | | | |
| DCGT070204E-62 | | | | | | | | | | | ◆ | | | | | ◆ |
| DCGT11T301E-62 | | | | | | | | | | | ◆ | | | | | |
| DCGT11T302E-62 | | | | | | | | | | | ◆ | | | | | |
| DCGT11T304E-62 | | | | | | | | | | | ◆ | | | | | |
| DCGT11T308E-62 | | | | | | | | | | | ◆ | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |



Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# DCGT, DCMT

## 64 Geometry



| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| DCGT11T304F-64 | | | | | | | | | | | | | | | ◆ | |
| DCGT11T308F-64 | | | | | | | | | | | | | | | ◆ | |

## M Geometry



| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DCMT11T304E-M | | | | ◆◆ | | | | | | | | | ◆ | | | ◆ |
| DCMT150404E-M | | | | ◆◆ | | | | | | | | | | | | |
| DCMT150408E-M | | | | ◆◆ | | | | | | | | | | | | |

## 3G Geometry



| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DCMT070202E-3G | | | | | | | | | | | | | | | | |
| DCMT070204E-3G | | | ◆◆ | | ◆◆ | | ◆◆ | | | | | | | | | |
| DCMT070208E-3G | | | | | ◆◆ | | ◆◆ | | | | | | | | | |
| DCMT11T302E-3G | | | | | | | ◆◆ | | | | | | | | | |
| DCMT11T304E-3G | | | ◆◆ | | | | ◆◆ | | | | | | | | | |
| DCMT11T308E-3G | | | ◆◆ | | ◆◆ | | ◆◆ | | | | | | | | | |
| DCMT11T312E-3G | | | | | | | ◆◆ | | | | | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

Indicates stocked item and material application range.

## Star Guide — Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

## 4T Geometry



| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| DCMT070202E-4T | ◆ | ◆ | | | | | | | | | | | | | ◆ | |
| DCMT070204E-4T | ◆ | ◆ | | | ◆ | | | | ◆ | | | | | | ◆ | |
| DCMT11T304E-4T | ◆ | ◆ | | ◆ | ◆ | | | | ◆ | | | | ◆ | | | |
| DCMT11T308E-4T | ◆ | ◆ | | ◆ | ◆ | | | | ◆ | | | | ◆ | | | |
| DCMT150408E-4T | | | | ◆ | | | | | ◆ | | | | | | | |

## Flat Top

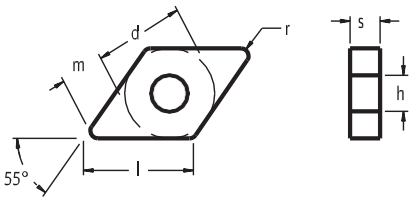


| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DCMW11T304E | | | | | | | | | | | | | | | ◆ | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

Indicates stocked item and material application range.

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# DNGG




| Dimensions for DNGG, DNMA and DNMG | | | | | | | |
|---|---|---|---|---|---|---|---|
| Size | d<br>mm | l<br>mm | s<br>mm | r<br>mm | m<br>mm | $m_1$<br>mm | h<br>mm |
| 110404 | 9,52 | 11,00 | 4,76 | 0,40 | 5,08 | - | 4,39 |
| 110408 | 9,52 | 11,00 | 4,76 | 0,80 | 4,62 | - | 4,39 |
| 150401 | 12,70 | 15,50 | 4,76 | 0,10 | 7,29 | - | 5,16 |
| 150402 | 12,70 | 15,50 | 4,76 | 0,20 | 7,17 | - | 5,16 |
| 150404 | 12,70 | 15,50 | 4,76 | 0,40 | 6,93 | - | 5,16 |
| 150408 | 12,70 | 15,50 | 4,76 | 0,80 | 6,47 | - | 5,16 |
| 150412 | 12,70 | 15,50 | 4,76 | 1,20 | 6,01 | - | 5,16 |
| 150601 | 12,70 | 15,50 | 6,35 | 0,10 | 7,29 | - | 5,16 |
| 150602 | 12,70 | 15,50 | 6,35 | 0,20 | 7,17 | - | 5,16 |
| 150604 | 12,70 | 15,50 | 6,35 | 0,40 | 6,93 | - | 5,16 |
| 150608 | 12,70 | 15,50 | 6,35 | 0,80 | 6,47 | - | 5,16 |
| 150612 | 12,70 | 15,50 | 6,35 | 1,20 | 6,01 | - | 5,16 |
| 190608 | 15,88 | 19,40 | 6,35 | 0,80 | 8,32 | - | 6,35 |
| 190612 | 15,88 | 19,40 | 6,35 | 1,20 | 7,86 | - | 6,35 |

## 3F Geometry

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| DNGG150401F-3F | | | | | | | | ◆ | | | | | | | | |
| DNGG150402F-3F | | | | | | | | ◆ | | | | | | | | |
| DNGG150404F-3F | | | | | | | | ◆ | | | | | | | | |
| DNGG150408F-3F | | | | | | | | | | | | | | | | |
| DNGG150601F-3F | | | | | | | | ◆ | | | | | | | | |
| DNGG150602F-3F | | | | | | | | ◆ | | | | | | | | |
| DNGG150604F-3F | | | | | | | | ◆ | | | | | | | | |
| DNGG150608F-3F | | | | | | | | | | ◆ | | | | | | |



v Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# DNMA, DNMG

## Flat Top



| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| DNMA150608E | | | | | | ◆ | | | | | | | | | | |

## 1A Geometry



| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DNMG110404E-1A | | | | | | | | | | ◆◆ | | | | | | |
| DNMG150402E-1A | | | | | | | | | ◆◆ | | | | | | | |
| DNMG150404E-1A | | | | | | | | | | ◆◆ | | | | | | |
| DNMG150604E-1A | | | | | | | | | | ◆◆ | | | | | | |
| DNMG150608E-1A | | | | | | | | | | ◆◆ | | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# DNMG

## 2B Geometry



| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| DNMG150404E-2B | ◆◆ | | | | | | ◆ | | | | | | | | | |
| DNMG150408E-2B | ◆◆ | ◆◆ | | | | | ◆ | | | | | | | | | |
| DNMG150412E-2B | | | | | | | ◆ | | | | | | | | | |
| DNMG150608E-2B | | | | | | | ◆ | | | | | | | | | |

## 2N Geometry



| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| DNMG110404E-2N | ◆◆ | | | | ◆◆ | | | | | | | | | | | |
| DNMG110408E-2N | | | | | ◆◆ | | | | | | | | | | | |
| DNMG150404E-2N | | ◆◆ | | | ◆◆ | | | ◆◆ | | | | | | | | |
| DNMG150408E-2N | ◆◆ | ◆◆ | | | ◆◆ | | | ◆◆ | | | | | | | | |
| DNMG150412E-2N | | ◆◆ | | | | | | | | | | | | | | |
| DNMG150608E-2N | ◆◆ | ◆◆ | ◆◆ | | ◆◆ | | | | | | | | | | | |
| DNMG150612E-2N | | ◆◆ | ◆◆ | | | | | | | | | | | | | |

Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

## 3G Geometry

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| DNMG150404E-3G | ◆ | ◆ | ◆ | | | | ◆ | | | | | | | | | |
| DNMG150408E-3G | ◆ | ◆ | ◆ | | ◆ | | ◆ | | | | | | | | | |
| DNMG150412E-3G | | | ◆ | | | | ◆ | | | | | | | | | |
| DNMG150604E-3G | ◆ | ◆ | | | | | ◆ | | | | | | | | | |
| DNMG150608E-3G | ◆ | ◆ | | | | | ◆ | | | | | | | | | |
| DNMG150612E-3G | ◆ | | | | | | | | | | | | | | | |



## 3J Geometry

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DNMG110404E-3J | | | | | | | | | | | ◆ | | | | | |
| DNMG150404E-3J | | | | | | | | | | | ◆ | | | | | |
| DNMG150408E-3J | | | | ◆ | | | | | ◆ | | ◆ | | | | | |
| DNMG150412E-3J | | ◆ | | | | | | | | | | | | | | |
| DNMG150604E-3J | | | | ◆ | | | | | ◆ | | ◆ | | | | | |
| DNMG150608E-3J | | | | ◆ | | | | | ◆ | | ◆ | | | | | |
| DNMG150612E-3J | | | | ◆ | | | | | | | | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |



Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# DNMG

## 4T Geometry



| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| DNMG150404E-4T | | ◆◆◆ | | | ◆◆◆ | | | | ◆◆◆ | | | | | | | |
| DNMG150408E-4T | ◆◆◆ | ◆◆◆ | | ◆◆◆ | ◆◆◆ | | ◆◆◆ | | ◆◆◆ | | | | | ◆◆◆ | | |
| DNMG150412E-4T | | ◆◆◆ | | | ◆◆◆ | | ◆◆◆ | | ◆◆◆ | | | | | | | |
| DNMG150604E-4T | ◆◆◆ | | | | | | | | | | | | | | | |
| DNMG150608E-4T | ◆◆◆ | ◆◆◆ | | ◆◆◆ | ◆◆◆ | | ◆◆◆ | | ◆◆◆ | | | | | | | |
| DNMG150612E-4T | ◆◆◆ | | | | | | | | ◆◆◆ | | | | | | | |
| DNMG190608E-4T | ◆◆◆ | ◆◆◆ | | | | | ◆◆◆ | | | | | | | | | |
| DNMG190612E-4T | ◆◆◆ | ◆◆◆ | | | ◆◆◆ | | ◆◆◆ | | | | | | | | | |

## 4U Geometry

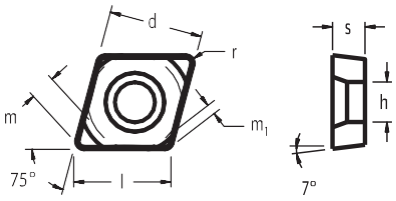


| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DNMG150408E-4U | | | | | ◆ | | | | | | | | | | | |
| DNMG150412E-4U | | | | | ◆ | | | | | | | | | | | |
| DNMG150608E-4U | | | | | ◆ | | | | | | | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |




| Dimensions for EXMT and EXMW | | | | | | | |
|---|---|---|---|---|---|---|---|
| Size | d mm | l mm | s mm | r mm | m mm | $m_1$ mm | h mm |
| 09T304 | 9,52 | 9,85 | 3,97 | 0,40 | 2,80 | 1,13 | 4,40 |
| 09T308 | 9,52 | 9,85 | 3,97 | 0,80 | 2,55 | 1,03 | 4,40 |
| 12T304 | 12,00 | 12,40 | 3,97 | 0,40 | 3,60 | 1,45 | 5,40 |
| 12T308 | 12,00 | 12,40 | 3,97 | 0,80 | 3,34 | 1,35 | 5,40 |
| 12T312 | 12,00 | 12,40 | 3,97 | 1,20 | 3,08 | 1,25 | 5,40 |
| 16M608 | 15,88 | 16,40 | 6,00 | 0,80 | 4,59 | 1,86 | 6,40 |
| 16M612 | 15,88 | 16,40 | 6,00 | 1,20 | 4,33 | 1,75 | 6,40 |

## G Geometry

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| EXMT12T304E-G | | | | | | | | | | | | | | | | ◆◆ |
| EXMT12T308E-G | | | | ◆◆ | | | | | | | | | | | ◆◆ | |
| EXMT16M608E-G | | | | | | | | | | | | | | | | ◆◆ |



## 4T Geometry

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EXMT09T304E-4T | | ◆◆ | ◆◆ | | | | | ◆◆ | ◆◆ | | | | | | | |
| EXMT09T308E-4T | | ◆◆ | ◆◆ | | | | | ◆◆ | ◆◆ | | | | | | | |
| EXMT12T304E-4T | | ◆◆ | ◆◆ | | | | | ◆◆ | ◆◆ | | | | | | | |
| EXMT12T308E-4T | | ◆◆ | ◆◆ | | | | | | | | | | | | | |
| EXMT12T312E-4T | | ◆◆ | ◆◆ | | | | | ◆◆ | ◆◆ | | | | | | | |
| EXMT16M608E-4T | | ◆◆ | ◆◆ | | | | | ◆◆ | ◆◆ | | | | | | | |
| EXMT16M612E-4T | | ◆◆ | ◆◆ | | ◆ | | | ◆◆ | ◆◆ | | | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |



v Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# EXMW

## W Geometry

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| EXMW12T304E | | | | | | | | | | | | | | | ◆ | |
| EXMW12T308E | | | | | | | | | | | | | | | ◆ | |

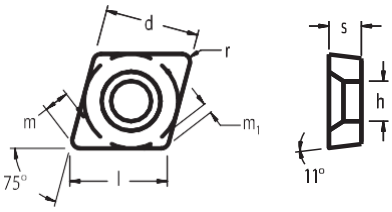


v Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# EPEW




| Dimensions for EPEW, EPEX, EPGT, EPMT, EPMW and EPMX | | | | | | | |
|---|---|---|---|---|---|---|---|
| Size | d mm | l mm | s mm | r mm | m mm | $m_1$ mm | h mm |
| 040202 | 4,76 | 4,93 | 2,38 | 0,20 | 1,40 | 0,56 | 2,30 |
| 040204 | 4,76 | 4,93 | 2,38 | 0,40 | 1,27 | 0,51 | 2,30 |
| 060202 | 6,35 | 6,54 | 2,38 | 0,20 | 1,91 | 0,77 | 2,80 |
| 060204 | 6,35 | 6,54 | 2,38 | 0,40 | 1,78 | 0,72 | 2,80 |
| 08M300 | 8,00 | 8,20 | 3,00 | 0,00 | 2,57 | 1,04 | 4,20 |
| 08M301 | 8,00 | 8,20 | 3,00 | 0,10 | 2,50 | 1,02 | 4,20 |
| 08M302 | 8,00 | 8,20 | 3,00 | 0,20 | 2,43 | 0,98 | 4,20 |
| 08M304 | 8,00 | 8,20 | 3,00 | 0,40 | 2,30 | 0,93 | 4,20 |
| 08M308 | 8,00 | 8,20 | 3,00 | 0,80 | 2,04 | 0,83 | 4,20 |

## Flat Top



| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| EPEW040202F | | | | | | | | | | | ◆ | | | | ◆ | |
| EPEW040204F | | | | | | | | | | | ◆ | | | | ◆ | |
| EPEW060202F | | | | | | | | | | | ◆ | | | | ◆ | |
| EPEW060204F | | | | | | | | | | | ◆ | | | | ◆ | ◆ |
| EPEW08M300F | | | | | | | | | | | ◆ | | | | ◆ | |
| EPEW08M302F | | | | | | | | | | | ◆ | | | | ◆ | |
| EPEW08M304F | | | | | | | | | | | ◆ | | | | ◆ | |
| EPEW08M308F | | | | | | | | | | | ◆ | | | | ◆ | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

〉Indicates stocked item and material application range.

## Star Guide  Key to Recommended Inserts

| Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# EPEX

## X Geometry

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| EPEX060202FR | | | | | | | | | | | ◆ | | | | ◆ | |
| EPEX060202FL | | | | | | | | | | | ◆ | | | | ◆ | |
| EPEX060202FR | | | | | | | | | | | ◆ | | | | ◆ | |
| EPEX060204FL | | | | | | | | | | | ◆ | | | | ◆ | ◆ |
| EPEX060204FR | | | | | | | | | | | ◆ | | | | ◆ | |
| EPEX08M300FL | | | | | | | | | | | ◆ | | | | ◆ | |
| EPEX08M300FR | | | | | | | | | | | ◆ | | | | ◆ | |
| EPEX08M301FL | | | | | | | | | | | | | | | ◆ | |
| EPEX08M301FR | | | | | | | | | | | | | | | ◆ | |
| EPEX08M302FL | | | | | | | | | | | | | | | ◆ | |
| EPEX08M302FR | | | | | | | | | | | | | | | ◆ | |
| EPEX08M304FL | | | | | | | | | | | | | | | ◆ | |
| EPEX08M304FR | | | | | | | | | | | | | | | ◆ | |
| EPEX08M308FL | | | | | | | | | | | ◆ | | | | ◆ | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

## 15 Geometry



| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| EPEX040202F-15 | | | | | | | | | | | | | | | ◆◆◆ | |

## 62 Geometry



| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EPGT040202E-62 | | ◆◆ | ◆◆ | | | | | ◆◆ | ◆◆ | | ◆◆◆ | | | | | |
| EPGT040204E-62 | | ◆◆ | ◆◆ | | | | | ◆◆ | ◆◆ | | ◆◆◆ | | | | | |
| EPGT060202E-62 | | | | | | | | | | | ◆◆◆ | | | | | |
| EPGT060204E-62 | | | | | | | | | | | ◆◆◆ | | | | | |
| EPGT08M300E-62 | | ◆◆ | ◆◆ | | | | | ◆◆ | ◆◆ | | ◆◆◆ | | | | | |
| EPGT08M301E-62 | | ◆◆ | ◆◆ | | | | | | | | ◆◆◆ | | | | | |
| EPGT08M302E-62 | | ◆◆ | ◆◆ | | | | | ◆◆ | ◆◆ | | ◆◆◆ | | | | | |
| EPGT08M304E-62 | | ◆◆ | ◆◆ | | | | | ◆◆ | ◆◆ | | ◆◆◆ | | | | | |
| EPGT08M308E-62 | | ◆◆ | ◆◆ | | ◆ | | | ◆◆ | ◆◆ | | ◆◆◆ | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

## Star Guide  Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# EPMT, EPMW

## T Geometry



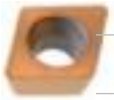
| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| EPMT060202E | ◆ | ◆ | | | ◆ | | | | | | | | ◆ | | ◆ | |
| EPMT060204E | ◆ | ◆ | | ◆ | ◆ | | | | | | | | ◆ | | ◆ | |
| EPMT08M302E | ◆ | | | | ◆ | | | | | | | | ◆ | | ◆ | ◆ |
| EPMT08M304E | ◆ | | | ◆ | ◆ | | | | | | | | ◆ | | ◆ | ◆ |
| EPMT08M308E | ◆ | | | | | | | | | | | | ◆ | | ◆ | |

## 73 Geometry



| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EPMT08M302E-73 | ◆ | ◆ | | | ◆ | | | | | | | | ◆ | | | ◆ |
| EPMT08M304E-73 | ◆ | ◆ | | ◆ | ◆ | | | | | | | | ◆ | | | |
| EPMT08M308E-73 | ◆ | ◆ | | ◆ | ◆ | | | | | | | | ◆ | | | ◆ |

## Flat Top



| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EPMW040202E | | ◆ | ◆ | | | | | ◆ | ◆ | | ◆ | | | | ◆ | |
| EPMW040204E | | ◆ | ◆ | | | | | | | | ◆ | | | | ◆ | |
| EPMW08M302E | | ◆ | ◆ | | | | | ◆ | ◆ | | ◆ | | | | ◆ | |
| EPMW08M304E | | ◆ | ◆ | | | | | ◆ | ◆ | | ◆ | | | | ◆ | |
| EPMW08M308E | | ◆ | ◆ | | ◆ | | | ◆ | ◆ | | ◆ | | | | ◆ | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

/ Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# EPMX

## X Geometry



| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| EPMX08M302EL | | | | | ◆ | | | | | | | | | | | |
| EPMX08M302ER | | | | | ◆ | | | | | | | | | | | |
| EPMX08M302FL | | | | | | | | | | | | | | | ◆◆ | |
| EPMX08M304FL | | | | | | | | | | | | | | | ◆◆ | |
| EPMX08M302FR | | | | | | | | | | | | | | | ◆◆ | |
| EPMX08M304FR | | | | | | | | | | | | | ◆◆ | | ◆◆ | |

## 15 Geometry



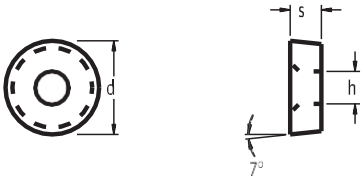
| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EPMX040202F-15 | | | | | | | | | | | | | | | ◆◆ | |
| EPMX040204F-15 | | | | | | | | | | | | | | | ◆◆ | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# RCEW, RCMT




| Dimensions for RCEW and RCMT | | | | | | | |
|---|---|---|---|---|---|---|---|
| Size | d mm | l mm | s mm | r mm | m mm | $m_1$ mm | h mm |
| 0602M0 | 6,00 | - | 2,38 | - | - | - | 2,79 |
| 09T300 | 9,53 | - | 3,97 | - | - | - | 3,40 |
| 10T3M0 | 10,00 | - | 3,97 | - | - | - | 4,39 |
| 1204M0 | 12,00 | - | 4,76 | - | - | - | 5,50 |
| 120400 | 12,70 | - | 4,76 | - | - | - | 4,39 |
| 1606M0 | 16,00 | - | 6,35 | - | - | - | 5,51 |
| 190600 | 19,05 | - | 6,35 | - | - | - | 6,50 |
| 2006M0 | 20,00 | - | 6,35 | - | - | - | 6,50 |

## Flat Top

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| RCEW0602M0F | | | | | | | | | | | | | | | ◆ | |

## T Geometry



| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RCMT0602M0E | ◆◆ | | | | ◆◆ | | | | | | | | | | | |
| RCMT10T3M0E | ◆◆ | | | | ◆◆ | | | | | | | | | | | |
| RCMT1204M0E | ◆◆ | | | | ◆◆ | | | | | | | | | | | |
| RCMT1606M0E | | | | | ◆◆ | | | | | | | | | | | |
| RCMT2006M0E | ◆◆ | | | | ◆◆ | | | | | | | | | | | |

## 2N Geometry



| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RCMT190600E-2N | ◆◆ | | | | ◆◆ | | | | | | | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

Indicates stocked item and material application range.

## Star Guide — Key to Recommended Inserts

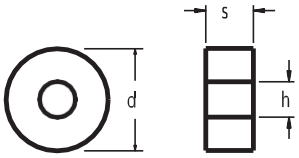
| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

## 3G Geometry

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| RCMT09T300E-3G | | | | | | | ◆ | | | | | | | | | |
| RCMT10T3M0E-3G | | | | | | | ◆ | | | | | | | | | |
| RCMT120400E-3G | | | | | | | ◆ | | | | | | | | | |



Indicates stocked item and material application range.




| Dimensions for RNMG | | | | | | | |
|---|---|---|---|---|---|---|---|
| Size | d mm | l mm | s mm | r mm | m mm | m1 mm | h mm |
| 250900 | 25,40 | - | 9,52 | - | - | - | 9,12 |

## 4T Geometry

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| RNMG250900E-4T | | ◆ | | | | | | | | | | | | | | |

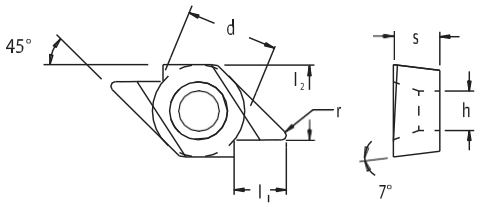


Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# SBET




| Dimensions for SBET | | | | | | |
|---|---|---|---|---|---|---|
| Size | d mm | $l_1$ mm | $l_2$ mm | r mm | s mm | h mm |
| 090305R | 6,50 | 7,95 | 5,01 | 0,05 | 4,00 | 3,40 |
| 090315R | 6,50 | 7,95 | 4,86 | 0,15 | 4,00 | 3,40 |
| 090340R | 6,50 | 7,95 | 4,50 | 0,40 | 4,00 | 3,40 |

## Behind Shoulder Machining

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number | | | | | | | | | | | | | | | | |
| SBET090305R | | | | | | | | | | | ◆ | | | | | ◆ |
| SBET090315R | | | | | | | | | | | ◆ | | | | | |
| SBET090340R | | | | | | | | | | | ◆ | | | | | |

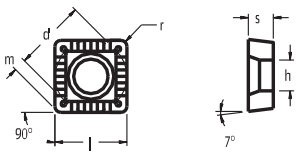


NOTE: The part number for these inserts are Stellram specific as ISO 1832 does not cater for this style of insert.
◆ Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# SCMT




| Dimensions for SCMT, SCMW and SCMX | | | | | | | |
|---|---|---|---|---|---|---|---|
| Size | d mm | l mm | s mm | r mm | m mm | $m_1$ mm | h mm |
| 09T304 | 9,53 | 9,53 | 3,97 | 0,40 | 1,81 | - | 4,40 |
| 09T308 | 9,53 | 9,53 | 3,97 | 0,80 | 1,64 | - | 4,40 |
| 12M504 | 12,70 | 12,70 | 5,00 | 0,40 | 2,47 | - | 5,50 |
| 12M508 | 12,70 | 12,70 | 5,00 | 0,80 | 2,30 | - | 5,50 |
| 12M512 | 12,70 | 12,70 | 5,00 | 1,20 | 2,14 | - | 5,50 |
| 120404 | 12,70 | 12,70 | 4,76 | 0,40 | 2,47 | - | 5,50 |
| 120408 | 12,70 | 12,70 | 4,76 | 0,80 | 2,30 | - | 5,50 |
| 120412 | 12,70 | 12,70 | 4,76 | 1,20 | 2,14 | - | 5,50 |

## T Geometry



| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| SCMT09T304E | | | | | | | | | | | | | ◆ | | | |
| SCMT09T308E | | | | | | | | | | | | | ◆ | | ◆ | |
| SCMT12M504E | | | | | | | | | | | | | ◆ | | | ◆ |
| SCMT12M508E | ◆ | | | ◆ | ◆ | | | | | | | | ◆ | | ◆ | ◆ |

## 3G Geometry



| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SCMT09T304E-3G | | | | ◆ | | | ◆ | | | | | | | | | |
| SCMT09T308E-3G | | | ◆ | | ◆ | | ◆ | | | | | | | | | |
| SCMT120408E-3G | | | | | ◆ | | ◆ | | | | | | | | | |
| SCMT120412E-3G | | | | | ◆ | | | | | | | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# SCMT, SCMW, SCMX

## 73 Geometry



| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| SCMT09T304E-73 | | ◆ | | | ◆ | | | | | | | | | | | |
| SCMT09T308E-73 | | ◆ | | | ◆ | | | | | | | | | | | |
| SCMT12M504E-73 | | ◆ | | | ◆ | | | | | | | | | | | |
| SCMT12M508E-73 | ◆ | ◆ | | ◆ | ◆ | | | | | | | | | | | ◆ |

## Flat Top



| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SCMW09T304E | | | | | | | | | | | | | | | ◆ | |
| SCMW09T308E | | | | | | | | | | | | | | | ◆ | |
| SCMW12M508E | | | | | | | | | | | | | | | ◆ | |

## X Geometry



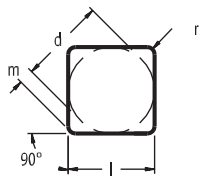
| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SCMX09T304FL | | | | | | | | | | | | | | | ◆ | |
| SCMX09T304FL | | | | | | | | | | | | | | | ◆ | |
| SCMX09T308FL | | | | | | | | | | | | | | | ◆ | |
| SCMX09T308FR | | | | | | | | | | | | | | | ◆ | |
| SCMX12M508FL | | | | | | | | | | | | | | | ◆ | |
| SCMX12M508FR | | | | | | | | | | | | | | | ◆ | |
| SCMX12M512ER | | | | | | | | | | | | | | | ◆ | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

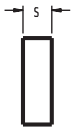
Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# SNGN, SNUN




| Dimensions for SNGN and SNUN | | | | | | | |
|---|---|---|---|---|---|---|---|
| Size | d mm | l mm | s mm | r mm | m mm | $m_1$ mm | h mm |
| 120412 | 12,70 | 12,70 | 4,76 | 1,20 | 2,14 | - | - |
| 120432 | 12,70 | 12,70 | 4,76 | 3,20 | 1,30 | - | - |
| 190412 | 19,05 | 19,05 | 4,76 | 1,20 | 3,45 | - | - |

## Flat Top

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| SNGN120432E | | | | | | ◆ | | | | | | | | | | |

## Flat Top

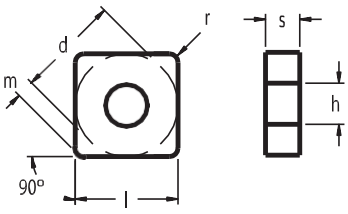
| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SNUN120412E | | ◆ | | | | | | | | | | | | | | |
| SNUN190412E | | ◆ | | | | | | | | | | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# SNMA




| Dimensions for SNMA, SNMG, SNMM | | | | | | | |
|---|---|---|---|---|---|---|---|
| Size | d mm | l mm | s mm | r mm | m mm | $m_1$ mm | h mm |
| 090308 | 9,53 | 9,53 | 3,18 | 0,80 | 1,64 | - | 3,81 |
| 120408 | 12,70 | 12,70 | 4,76 | 0,80 | 2,30 | - | 5,16 |
| 120412 | 12,70 | 12,70 | 4,76 | 1,20 | 2,14 | - | 5,16 |
| 120416 | 12,70 | 12,70 | 4,76 | 1,60 | 1,96 | - | 5,16 |
| 150608 | 15,88 | 15,88 | 6,35 | 0,80 | 2,96 | - | 6,35 |
| 150612 | 15,88 | 15,88 | 6,35 | 1,20 | 2,80 | - | 6,35 |
| 150616 | 15,88 | 15,88 | 6,35 | 1,60 | 2,63 | - | 6,35 |
| 190612 | 19,05 | 19,05 | 6,35 | 1,20 | 3,45 | - | 7,94 |
| 190616 | 19,05 | 19,05 | 6,35 | 1,60 | 3,29 | - | 7,94 |
| 190632 | 19,05 | 19,05 | 6,35 | 3,20 | 2,64 | - | 7,94 |

## Flat Top

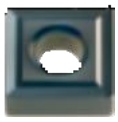
| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| SNMA120408E | | | | | | ◆ | | | | | | | | | | |
| SNMA120412E | | | | | | ◆ | | | | | | | | | | |
| SNMA120416E | | ◆ | | | | | | | | | | | | | | |
| SNMA190616E | | | | | | ◆ | ◆ | | | | | | | | | |
| SNMA190632E | | | | | | ◆ | ◆ | | | | | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

## 91 Geometry



| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| SNMG120408E-91 | | | | | | | | ◆ | | | | | | | | |

## 2B Geometry



| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SNMG120408E-2B | | | | | | | ◆ | | | | | | | | | |

## 2N Geometry



| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SNMG120408E-2N | | ◆ | | | ◆ | | | ◆ | | | | | | | | |
| SNMG120412E-2N | | | | | ◆ | | | | | | | | | | | |
| SNMG150612E-2N | ◆ | | | | ◆ | | | | | | | | | | | |
| SNMG190612E-2N | | ◆ | | | ◆ | | | | | | | | | | | |

## 3G Geometry



| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SNMG090308E-3G | | | | | | | ◆ | | | | | | | | | |
| SNMG120408E-3G | | ◆ | | | | | ◆ | | | | | | | | | |
| SNMG120412E-3G | ◆ | | | | | | | | | | | | | | | |
| SNMG120416E-3G | | ◆ | | | | | | | | | | | | | | |
| SNMG190612E-3G | ◆ | | | | | | | | | | | | | | | |
| SNMG190616E-3G | | | | | | | | | | | | | | ◆ | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# SNMG

## 3J Geometry



| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| SNMG120408E-3J | | ◆◆ | | | | | | | ◆◆ | | ◆◆ | | | | | |
| SNMG120412E-3J | | | | | | | | | ◆◆ | | ◆◆ | | | | | |
| SNMG150612E-3J | | ◆◆ | | ◆◆ | | | | | | | | | | | | |
| SNMG190616E-3J | | | | ◆◆ | | | | | | | | | | | | |

## 4T Geometry



| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SNMG090308E-4T | | ◆◆ | | | | | | | | | | | | | | |
| SNMG120404E-4T | | | | | | | | | | | | | | | | |
| SNMG120408E-4T | ◆◆ | ◆◆ | | ◆◆ | ◆◆ | | ◆◆ | | | | | | | ◆◆ | | |
| SNMG120412E-4T | ◆◆ | ◆◆ | | ◆◆ | ◆◆ | | | | | | | | | | | |
| SNMG120416E-4T | | ◆◆ | | | | | | | | | | | | | | |
| SNMG150608E-4T | | ◆◆ | | | | | | | | | | | | | | |
| SNMG150612E-4T | ◆◆ | ◆◆ | | | ◆◆ | | | | | | | | | | | |
| SNMG150616E-4T | | | | ◆◆ | | | | | | | | | | | | |
| SNMG190612E-4T | ◆◆ | ◆◆ | | ◆◆ | ◆◆ | | ◆◆ | | | | | | | | | |
| SNMG190616E-4T | | ◆◆ | | ◆◆ | ◆◆ | | ◆◆ | | | | | | | ◆◆ | | |
| SNMG250924E-4T | | ◆◆ | | | | | | | | | | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# SNMG, SNMM

## MP Geometry

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
|  SNMG120408-MP | | | | | | ◆ | | | | | | | | | | |
| SNMG120412-MP | | | | | | ◆ | | | | | | | | | | |

## 4M Geometry

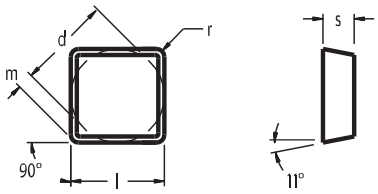
| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  SNMM190612E-4M | ◆ | ◆ | | | | | | | | | | | | | | |
| SNMM190616E-4M | ◆ | ◆ | | | ◆ | | | | | | | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# SPGN, SPUN




| Dimensions for SPGN and SPUN | | | | | | | |
|---|---|---|---|---|---|---|---|
| Size | d mm | l mm | s mm | r mm | m mm | $m_1$ mm | h mm |
| 090308 | 9,53 | 9,53 | 3,18 | 0,80 | 1,64 | - | - |
| 120308 | 12,70 | 12,70 | 3,18 | 0,80 | 2,30 | - | - |
| 120312 | 12,70 | 12,70 | 3,18 | 1,20 | 2,14 | - | - |
| 120412 | 12,70 | 12,70 | 4,76 | 1,20 | 2,14 | - | - |
| 190412 | 19,05 | 19,05 | 4,76 | 1,20 | 3,43 | - | - |
| 190416 | 19,05 | 19,05 | 4,76 | 1,60 | 3,28 | - | - |

## Flat Top

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| SPGN090308E | | ◆ | | | | | | | | | | | | | | |
| SPGN120308E | | ◆ | | | | | | | | | | | | | | |
| SPGN120308F | | | | | | | | | | | | | | ◆ | | |
| SPGN120312F | | | | | | | | | | | | | | ◆ | | |
| SPGN120412E | | | | | | | ◆ | | | | | | | | | |
| SPGN190412E | | | | | | | ◆ | | | | | | | | | |
| SPGN190412F | | | | | | | | | | | | | | ◆ | | |
| SPGN190416F | | | | | | | | | | | | | | ◆ | | |



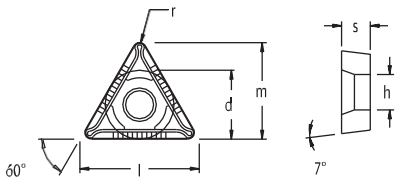
## Flat Top



| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SPUN120308E | | ◆ | | | | | | | | | | | | | | |
| SPUN190412E | | ◆ | | | | | | | | | | | | | | |
| SPUN190412F | | | | | | | | | | | | | | ◆ | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |




| Dimensions for TCMT, TCMW and TCMX | | | | | | | |
|---|---|---|---|---|---|---|---|
| Size | d mm | l mm | s mm | r mm | m mm | $m_1$ mm | h mm |
| 110202 | 6,35 | 11,00 | 2,38 | 0,20 | 9,32 | - | 2,80 |
| 110204 | 6,35 | 11,00 | 2,38 | 0,40 | 9,13 | - | 2,80 |
| 110208 | 6,35 | 11,00 | 2,38 | 0,80 | 8,73 | - | 2,80 |
| 16T304 | 9,53 | 16,50 | 3,97 | 0,40 | 13,89 | - | 4,40 |
| 16T308 | 9,53 | 16,50 | 3,97 | 0,80 | 13,49 | - | 4,40 |
| 22M504 | 12,70 | 22,00 | 5,00 | 0,40 | 18,65 | - | 5,50 |
| 22M508 | 12,70 | 22,00 | 5,00 | 0,80 | 18,26 | - | 5,50 |

## T Geometry

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| TCMT16T304E | ◆◆ | | | | ◆◆ | | | | | | | | | | ◆◆ | |
| TCMT16T308E | ◆◆ | | | | ◆◆ | | | | | | | | ◇ | | ◆◆ | ◆◆ |
| TCMT22M508E | | | | | | | | | | | | | ◇ | | | |



## 3G Geometry

| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TCMT110202E-3G | | | | | | | ◆◆ | | | | | | | | | |
| TCMT110204E-3G | | | | ◆◆ | ◆◆ | | ◆◆ | | | | | | | | | |
| TCMT110208E-3G | | | | | ◆◆ | | ◆◆ | | | | | | | | | |
| TCMT16T304E-3G | | | | | ◆◆ | | ◆◆ | | | | | | | | | |
| TCMT16T308E-3G | | | | ◆◆ | ◆◆ | | ◆◆ | | | | | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |



Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# TCMT, TCMW, TCMX

## 73 Geometry



| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| TCMT110202E-73 | ◆ | | | | | | | | | | | | | | | |
| TCMT110204E-73 | ◆ | ◆ | | | | | | | | | | | | | | |
| TCMT16T304E-73 | ◆ | ◆ | | | ◆ | | | | | | | | ◆ | | | |
| TCMT16T308E-73 | ◆ | ◆ | | | ◆ | | | | | | | | ◆ | | | |
| TCMT22M508E-73 | | | | | ◆ | | | | | | | | | | | |

## Flat Top



| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TCMW16T304E | | | | | | | | | | | | | | | ◆ | |
| TCMW22M508E | | | | | | | | | | | | | | | ◆ | |

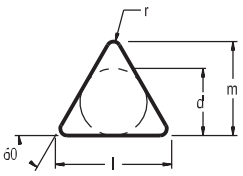
## X Geometry



| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TCMX16T304FL | | | | ◆ | ◆ | | ◆ | | | | | | | | ◆ | |
| TCMX16T304FR | | | | | ◆ | | ◆ | | | | | | | | ◆ | |
| TCMX16T308FL | | | | | ◆ | | ◆ | | | | | | | | ◆ | |
| TCMX16T308FR | | | | ◆ | ◆ | | ◆ | | | | | | | | ◆ | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

### Star Guide — Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |







| Dimensions for TNGN | | | | | | | |
|---|---|---|---|---|---|---|---|
| Size | d mm | l mm | s mm | r mm | m mm | $m_1$ mm | h mm |
| 160308 | 9,53 | 16,50 | 3,18 | 0,80 | 13,49 | - | - |

## Flat Top

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| TNGN160308E | | | | | | ◆ | | | | | | | | | | |

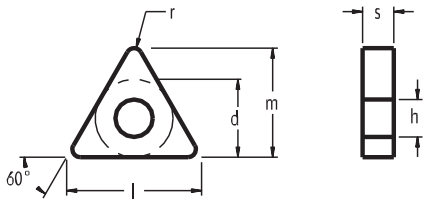


/ Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# TNMA




| Dimensions for TNMA, TNMG and TNMM | | | | | | | |
|---|---|---|---|---|---|---|---|
| Size | d<br>mm | l<br>mm | s<br>mm | r<br>mm | m<br>mm | $m_1$<br>mm | h<br>mm |
| 110304 | 6,35 | 11,00 | 3,18 | 0,40 | 9,12 | - | 2,36 |
| 160304 | 9,53 | 16,50 | 3,18 | 0,40 | 13,89 | - | 3,81 |
| 160308 | 9,53 | 16,50 | 3,18 | 0,80 | 13,49 | - | 3,81 |
| 160312 | 9,53 | 16,50 | 3,18 | 1,20 | 13,10 | - | 3,81 |
| 160402 | 9,53 | 16,50 | 4,76 | 0,20 | 14,08 | - | 3,81 |
| 160404 | 9,53 | 16,50 | 4,76 | 0,40 | 13,89 | - | 3,81 |
| 160408 | 9,53 | 16,50 | 4,76 | 0,80 | 13,49 | - | 3,81 |
| 160412 | 9,53 | 16,50 | 4,76 | 1,20 | 13,10 | - | 3,81 |
| 220404 | 12,70 | 22,00 | 4,76 | 0,40 | 16,64 | - | 5,16 |
| 220408 | 12,70 | 22,00 | 4,76 | 0,80 | 18,26 | - | 5,16 |
| 220412 | 12,70 | 22,00 | 4,76 | 1,20 | 17,86 | - | 5,16 |
| 220416 | 12,70 | 22,00 | 4,76 | 1,60 | 17,46 | - | 5,16 |
| 220432 | 12,70 | 22,00 | 4,76 | 3,20 | 15,88 | - | 5,16 |
| 270608 | 15,88 | 27,50 | 6,35 | 0,80 | 23,01 | - | 6,35 |
| 270612 | 15,88 | 27,50 | 6,35 | 1,20 | 22,62 | - | 6,35 |
| 270616 | 15,88 | 27,50 | 6,35 | 1,60 | 22,23 | - | 6,35 |
| 270632 | 15,88 | 27,50 | 6,35 | 3,20 | 20,63 | - | 6,35 |
| 330924 | 19,05 | 33,50 | 9,52 | 2,40 | 26,19 | - | 7,92 |

## Flat Top

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| TNMA160408E | ◆ | | | | | ◆ | ◆ | | | | | | | | | |
| TNMA220408E | | | | | | ◆ | | | | | | | | | | |
| TNMA220412E | | | | | | ◆ | | | | | | | | | | |
| TNMA220416E | ◆ | | | | | ◆ | | | | | | | | | | |



Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

## 1A Geometry



| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| TNMG160308E-1A | | | | | | | | | ◆ | | | | | | | |
| TNMG160404E-1A | | | | | | | | | | | ◆ | | | | | |
| TNMG160408E-1A | | | | | | | | | ◆ | | ◆ | | | | | |

## 2B Geometry



| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TNMG160404E-2B | | | | | | | ◆ | | | | | | | | | |
| TNMG160408E-2B | | | | | | | ◆ | | | | | | | | | |
| TNMG220408E-2B | | ◆ | | | | | | | | | | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

Indicates stocked item and material application range.

## Star Guide  Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# TNMG

## 2N Geometry



| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| TNMG160404E-2N | ◆◆ | | | | | | | | | | | | | | | |
| TNMG160408E-2N | ◆◆ | ◆◆ | | | ◆◆ | | | | | | | | | | | |
| TNMG220404E-2N | ◆◆ | | | | | | | | | | | | | | | |
| TNMG220408E-2N | ◆◆ | ◆◆ | | | ◆◆ | | | | | | | | | | | |
| TNMG220412E-2N | | | | | ◆◆ | | | | | | | | | | | |

## 3G Geometry



| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TNMG160304E-3G | | ◆◆ | | | | | | | | | | | | | | |
| TNMG160308E-3G | | ◆◆ | | | | | ◆◆ | | | | | | | | | |
| TNMG160404E-3G | | ◆◆ | | | ◆◆ | | ◆◆ | | | | | | | | | |
| TNMG160408E-3G | ◆◆ | ◆◆ | ◆◆ | | | | ◆◆ | | | | | | | | | |
| TNMG220404E-3G | | ◆◆ | | | | | ◆◆ | | | | | | | | | |
| TNMG220408E-3G | ◆◆ | ◆◆ | | | | | ◆◆ | | | | | | | | | |
| TNMG270608E-3G | | ◆◆ | | | | | | | | | | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

## Star Guide — Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

## 3J Geometry

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| TNMG160404E-3J | | | | ◆◆ | | | | | ◆◆ | | ◆◆ | | | | | |
| TNMG160408E-3J | | ◆◆ | | ◆◆ | | | | | ◆◆ | | ◆◆ | | | | | |
| TNMG220408E-3J | | | | ◆◆ | | | | | ◆◆ | | | | | | | |
| TNMG220412E-3J | | | | | | | | | ◆◆ | | | | | | | |



◆◆ Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# TNMG

## 4T Geometry

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| TNMG160304E-4T | | ◆◆◆ | | | | | ◆◆◆ | | | | | | | | | |
| TNMG160308E-4T | ◆◆◆ | ◆◆◆ | | | ◆◆◆ | | | | | | | | | | | |
| TNMG160404E-4T | | ◆◆◆ | | | | | ◆◆◆ | | | | | | | | | |
| TNMG160408E-4T | ◆◆◆ | ◆◆◆ | | ◆◆◆ | ◆◆◆ | | ◆◆◆ | | | | | | | | | |
| TNMG160412E-4T | ◆◆◆ | | | | ◆◆◆ | | | | | | | | | | | |
| TNMG220404E-4T | | ◆◆◆ | | | ◆◆◆ | | ◆◆◆ | | | | | | | | | |
| TNMG220408E-4T | ◆◆◆ | ◆◆◆ | | ◆◆◆ | ◆◆◆ | | ◆◆◆ | | | | | | | ◆◆◆ | | |
| TNMG220412E-4T | | ◆◆◆ | | | ◆◆◆ | | ◆◆◆ | | | | | | | | | |
| TNMG220416E-4T | | ◆◆◆ | | | ◆◆◆ | | | | | | | | | | | |
| TNMG220432E-4T | | ◆◆◆ | | | | | | | | | | | | | | |
| TNMG270608E-4T | | ◆◆◆ | | ◆◆◆ | | | ◆◆◆ | | | | | | | | | |
| TNMG270612E-4T | | ◆◆◆ | | | ◆◆◆ | | ◆◆◆ | | | | | | | | | |
| TNMG270616E-4T | | ◆◆◆ | | | ◆◆◆ | | | | | | | | | | | |
| TNMG270632E-4T | | ◆◆◆ | | | | | | | | | | | | | | |
| TNMG330924E-4T | | | | ◆◆◆ | | | | | | | | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |



Indicates stocked item and material application range.

## Star Guide — Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

## 4U Geometry

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| TNMG160408E-4U | | | | | | ◆ | | | | | | | | | | |
| TNMG160412E-4U | | | | | | ◆ | | | | | | | | | | |

## 4M Geometry



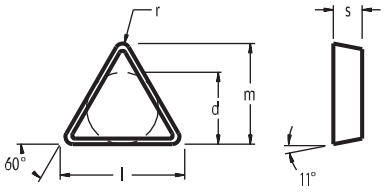
| TNMM220412E-4M | | ◆ | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# TPGN




| Dimensions for TPGN and TPUN | | | | | | | |
|---|---|---|---|---|---|---|---|
| Size | d mm | l mm | s mm | r mm | m mm | $m_1$ mm | h mm |
| 110304 | 6,35 | 11,00 | 3,18 | 0,40 | 9,13 | - | - |
| 160304 | 9,53 | 16,50 | 3,18 | 0,40 | 13,89 | - | - |
| 160308 | 9,53 | 16,50 | 3,18 | 0,80 | 13,49 | - | - |
| 160312 | 9,53 | 16,50 | 3,18 | 1,20 | 13,10 | - | - |
| 160316 | 9,53 | 16,50 | 3,18 | 1,60 | 12,70 | - | - |
| 220408 | 12,70 | 22,00 | 4,76 | 0,80 | 18,26 | - | - |
| 220412 | 12,70 | 22,00 | 4,76 | 1,20 | 17,86 | - | - |
| 220416 | 12,70 | 22,00 | 4,76 | 1,60 | 17,46 | - | - |

## Flat Top

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| TPGN160304E | | ◆ | | | | | ◆ | | | | | | | | | |
| TPGN160304F | | | | | | | | | | | | | | ◆ | | |
| TPGN160308E | | ◆ | | | | | ◆ | | | | | | | | | |
| TPGN160308F | | | | | | | | | | | | | | ◆ | | |
| TPGN160312E | | ◆ | | | | | ◆ | | | | | | | | | |
| TPGN220404E | | ◆ | | | | | ◆ | | | | | | | | | |
| TPGN220408E | | ◆ | | | | | | | | | | | | | | |
| TPGN220408F | | | | | | | | | | | | | | ◆ | | |
| TPGN220412E | | ◆ | | | | | | | | | | | | | | |
| TPGN220412F | | | | | | | | | | | | | | ◆ | | |
| TPGN220416F | | | | | | | | | | | | | | ◆ | | |



〉Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

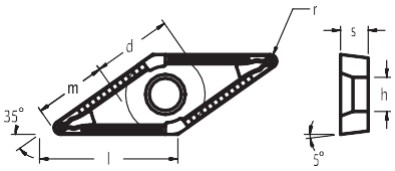
| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# TPUN, VBMT

## Flat Top

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
|  TPUN110304E | | | | | | | ◆ | | | | | | | | | |
| TPUN160304E | | ◆ | | | | | ◆ | | | | | | | | | |
| TPUN160308E | | ◆ | | | | | ◆ | | | | | | | | | |
| TPUN220408E | | ◆ | | | | | ◆ | | | | | | | | | |
| TPUN220412E | | ◆ | | | | | | | | | | | | | | |

Indicates stocked item and material application range.




| Dimensions for VBMT | | | | | | | |
|---|---|---|---|---|---|---|---|
| Size | d mm | l mm | s mm | r mm | m mm | $m_1$ mm | h mm |
| 160402 | 9,53 | 16,60 | 4,76 | 0,20 | 10,59 | - | 4,40 |
| 160404 | 9,53 | 16,60 | 4,76 | 0,40 | 10,14 | - | 4,40 |
| 160408 | 9,53 | 16,60 | 4,76 | 0,80 | 9,22 | - | 4,40 |

## 3G Geometry

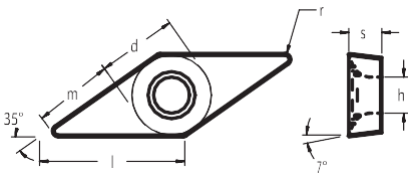
| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
|  VBMT160402E-3G | | | | | | | ◆◆ | | | | | | | | | |
| VBMT160404E-3G | | | ◆◆ | | ◆◆ | | ◆◆ | | | | | | | | | |
| VBMT160408E-3G | | | ◆◆ | | ◆◆ | | ◆◆ | | | | | | | | | |

Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# VCGT




| Dimensions for VCGT, VCGW, VCMT and VCMW | | | | | | | |
|---|---|---|---|---|---|---|---|
| Size | d<br>mm | l<br>mm | s<br>mm | r<br>mm | m<br>mm | $m_1$<br>mm | h<br>mm |
| 130301 | 7,94 | 13,80 | 3,18 | 0,10 | 9,00 | - | 3,40 |
| 130302 | 7,94 | 13,80 | 3,18 | 0,20 | 8,76 | - | 3,40 |
| 130304 | 7,94 | 13,80 | 3,18 | 0,40 | 8,31 | - | 3,40 |
| 130308 | 7,94 | 13,80 | 3,18 | 0,80 | 7,39 | - | 3,40 |
| 160404 | 9,53 | 16,60 | 4,76 | 0,40 | 10,14 | - | 4,40 |
| 160408 | 9,53 | 16,60 | 4,76 | 0,80 | 9,22 | - | 4,40 |

## M Geometry

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| VCGT130302E-m | ◆ | ◆ | | | | | | | | | | | | | | |
| VCGT130302F-m | | | | | | | | | | | | | | | ◆ | |
| VCGT130304E-m | ◆ | ◆ | | | | | | | | | | | | | ◆ | |

## 62 Geometry

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VCGT130301E-62 | | | | | | | | | | | ◆ | | | | | |
| VCGT130302E-62 | | | | | | | | | | | ◆ | | | | | |
| VCGT130304E-62 | | | | | | | | | | | ◆ | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

◆ Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Iron | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# VCGT, VCGW, VCMT, VCMW

## 64 Geometry

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
|  VCGT160408F-64 | | | | | | | | | | | | | | | ◆ | |

## 66 Geometry

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  VCGT130302F-66 | | | | | | | | | | | | | | | ◆ | |
| VCGT130304F-66 | | | | | | | | | | | | | | | ◆ | |
| VCGT130308F-66 | | | | | | | | | | | | | | | ◆ | |

## Flat Top

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  VCGW130304F | | | | | | | | | | | | | | | ◆ | |

## M Geometry

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  VCMT160404E-M | | | | ◆ | ◆ | | | | | | | | ◆ | | | |
| VCMT160408E-M | | | | ◆ | ◆ | | | | | | | | ◆ | | | ◆ |

## Flat Top

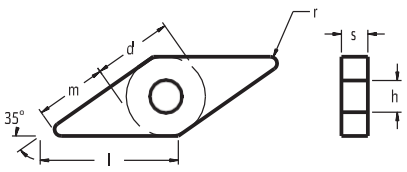
| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  VCMW160408E | | | | | | | | | | | | | | | ◆ | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# VNGG, VNMA




| Dimensions for VNGA, VNGG, VNMA and VNMG | | | | | | | |
|---|---|---|---|---|---|---|---|
| Size | d mm | l mm | s mm | r mm | m mm | $m_1$ mm | h mm |
| 160401 | 9,53 | 16,60 | 4,76 | 0,10 | 10,92 | - | 3,81 |
| 160402 | 9,53 | 16,60 | 4,76 | 0,20 | 10,66 | - | 3,81 |
| 160404 | 9,53 | 16,60 | 4,76 | 0,40 | 10,14 | - | 3,81 |
| 160408 | 9,53 | 16,60 | 4,76 | 0,80 | 9,22 | - | 3,81 |
| 160412 | 9,53 | 16,60 | 4,76 | 1,20 | 8,31 | - | 3,81 |
| 220404 | 12,70 | 22,00 | 4,76 | 0,40 | 13,84 | - | 5,16 |
| 220408 | 12,70 | 22,00 | 4,76 | 0,80 | 12,93 | - | 5,16 |

## 3F Geometry

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| VNGG160401F-3F | | | | | | | | ◆◆ | | ◆◆ | | | | | | |
| VNGG160402F-3F | | | | | | | | ◆◆ | | ◆◆ | | | | | | |
| VNGG160404F-3F | | | | | | | | ◆◆ | | ◆◆ | | ◆◆ | | | | |
| VNGG160408F-3F | | | | | | | | ◆◆ | | ◆◆ | | ◆◆ | | | | |

## Flat Top

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VNMA220408E | | | | | | | ◆ | | | | | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

## 1A Geometry



| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| VNMG160402E-1A | | | | | | | | | | | ◆◆ | | | | | |
| VNMG160404E-1A | | | | | | | | | | | ◆◆ | | | | | |
| VNMG160408E-1A | | ◆◆ | | | | | | | | | | | | | | |

## 2B Geometry



| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VNMG160408E-2B | | | | | | | ◆ | | | | | | | | | |
| VNMG220404E-2B | | ◆ | | | | | | | | | | | | | | |
| VNMG220408E-2B | | ◆ | | | | | | | | | | | | | | |

## 2N Geometry



| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VNMG160404E-2N | | | | | ◆◆ | | | ◆◆ | | | | | | | | |
| VNMG160408E-2N | ◆◆ | | | | ◆◆ | | | ◆◆ | | | | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# VNMG

## 3G Geometry

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| VNMG160404E-3G | ◆◆ | ◆◆ | ◆◆◆ | | ◆◆ | | ◆◆ | | | | | | | | | |
| VNMG160408E-3G | ◆◆ | ◆◆ | ◆◆◆ | | | | ◆◆ | | | | | | | | | |
| VNMG160412E-3G | ◆◆ | | ◆◆◆ | | | | | | | | | | | | | |
| VNMG220404E-3G | | ◆◆ | | | | | ◆◆ | | | | | | | | | |
| VNMG220408E-3G | ◆◆ | ◆◆ | | | | | ◆◆ | | | | | | | | | |

## 3J Geometry

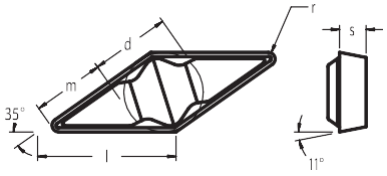
| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VNMG160408E-3J | | | | ◆◆ | | | | | ◆◆ | | ◆◆ | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# VPGR, VPMR




| Dimensions for VPGR and VPMR | | | | | | |
|---|---|---|---|---|---|---|
| Size | d<br>mm | l<br>mm | s<br>mm | r<br>mm | m<br>mm | $m_1$<br>mm |
| 160404 | 9,53 | 16,60 | 4,76 | 0,40 | 10,15 | - |
| 160408 | 9,53 | 16,60 | 4,76 | 0,80 | 9,23 | - |

## R Geometry

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
|  VPGR160404E | | | | | | | ◆ | | | | | | | | | |
| VPGR160408E | | | | | | | ◆ | | | | | | | | | |

## 3G Geometry

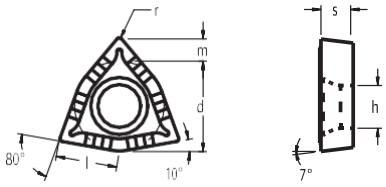
|  VPMR160408E-3G | | | | | | | ◆ | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

Indicates stocked item and material application range.

## Star Guide  Key to Recommended Inserts

| Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# JEMX




| Dimensions for WCMT | | | | | | | |
|---|---|---|---|---|---|---|---|
| Size | d mm | l mm | s mm | r mm | m mm | $m_1$ mm | h mm |
| 030208 | 5.56 | 3.8 | 2.38 | 0.8 | 1.2 | | 2.8 |
| 040208 | 6.35 | 4.3 | 2.38 | 0.8 | 1.6 | | 3.0 |
| 050308 | 7.94 | 5.4 | 3.18 | 0.8 | 1.8 | | 3.4 |
| 060408 | 9,53 | 6,52 | 3,97 | 0,80 | 2,20 | - | 3.70 |
| 080508 | 12.7 | 8.7 | 4.76 | 0.8 | 3.1 | | 4.3 |
| 080412 | 12.7 | 8.7 | 4.76 | 1.2 | 3.1 | | 4.3 |

## F Geometry



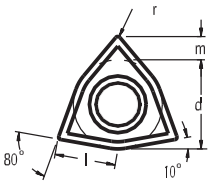
| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | ST100 | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| JEMX030208F | | | | | | | ◆ | | | | | | ◆ | | | |
| JEMX040208F | | | | | | | ◆ | | | | | | ◆ | | | |
| JEMX050308F | | | | | | | ◆ | | | | | | ◆ | | | |
| JEMX060408F | | | | | | | ◆ | | | | | | ◆ | | | |
| JEMX080508F | | | | | | | ◆ | | | | | | ◆ | | | |
| JEMX080412F | | | | | | | ◆ | | | | | | ◆ | | | |

Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# WNGG, WNMA




| Dimensions for WNGG, WNMA and WNMG | | | | | | | |
|---|---|---|---|---|---|---|---|
| Size | d<br>mm | l<br>mm | s<br>mm | r<br>mm | m<br>mm | $m_1$<br>mm | h<br>mm |
| 060404 | 9,53 | 6,52 | 4,76 | 0,40 | 2,43 | - | 3,81 |
| 060408 | 9,53 | 6,52 | 4,76 | 0,80 | 2,21 | - | 3,81 |
| 080401 | 12,70 | 8,69 | 4,76 | 0,10 | 3,45 | - | 5,16 |
| 080402 | 12,70 | 8,69 | 4,76 | 0,20 | 3,40 | - | 5,16 |
| 080404 | 12,70 | 8,69 | 4,76 | 0,40 | 3,30 | - | 5,16 |
| 080408 | 12,70 | 8,69 | 4,76 | 0,80 | 3,09 | - | 5,16 |
| 080412 | 12,70 | 8,69 | 4,76 | 1,20 | 2,87 | - | 5,16 |

## 3F Geometry

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| WNGG080401F-3F | | | | | | | | ◆ | | | | | | | | |
| WNGG080402F-3F | | | | | | | | ◆ | | | | | | | | |
| WNGG080404F-3F | | | | | | | | ◆ | | | | ◆ | | | | |
| WNGG080408F-3F | | | | | | | | ◆ | | | | ◆ | | | | |



## Flat Top



| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WNMA080408E | | | | | | ◆ | | | | | | | | | | | |
| WNMA080412E | | | | | | ◆ | | | | | | | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# WNMG

## 1A Geometry

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| WNMG060404E-1A | | | | | | | | | | | ◆ | | | | | |
| WNMG060408E-1A | ◆ | | | | | | | | | | | | | | | |
| WNMG080408E-1A | | | | | | | | | ◆ | | | | | | | |

## 2N Geometry

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WNMG060404E-2N | | | | | ◆ | | | | | | | | | | | |
| WNMG060408E-2N | ◆ | ◆ | ◆ | | ◆ | | | | | | | | | | | |
| WNMG080404E-2N | ◆ | ◆ | | | ◆ | | | ◆ | | | | | | | | |
| WNMG080408E-2N | ◆ | ◆ | | | ◆ | | | ◆ | | | | | | | | |
| WNMG080412E-2N | ◆ | | | | ◆ | | | ◆ | | | | | | | | |

## 3G Geometry

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WNMG060408E-3G | ◆ | | | | | | | | | | | | | | | |
| WNMG080404E-3G | | | | | | | ◆ | | | | | | | | | |
| WNMG080408E-3G | ◆ | ◆ | ◆ | | ◆ | | ◆ | | | | | | | | | |
| WNMG080412E-3G | | | ◆ | | | | | | | | | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

## 3J Geometry

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| WNMG060404E-3J | | | | | | | | | ◆◆ | | ◆◆ | | | | | |
| WNMG060408E-3J | | ◆◆ | | ◆◆ | | | | | ◆◆ | | ◆◆ | | | | | |
| WNMG080404E-3J | | | | ◆◆ | | | | | | | ◆◆ | | | | | |
| WNMG080408E-3J | | | | ◆◆ | | | | | ◆◆ | | ◆◆ | | | | | |
| WNMG080412E-3J | | | | | | | | | ◆◆ | | ◆◆ | | | | | |

## 3M Geometry

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WNMG080408E-3M | | | ◆◆ | | | | | | | | | | | | | |
| WNMG080412E-3M | | | ◆◆ | | | | | | | | | | | | | |

## 4T Geometry

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WNMG080408E-4T | ◆◆ | ◆◆ | ◆◆ | ◆◆ | ◆◆ | | ◆◆ | | ◆◆ | | | | | | | |
| WNMG080412E-4T | ◆◆ | ◆◆ | | ◆◆ | ◆◆ | | | | ◆◆ | | | | | | | |

## 4U Geometry

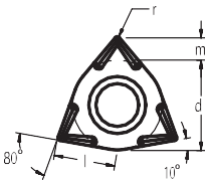
| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WNMG080408E-4U | | | ◆◆ | | | ◆ | | | | | | | | | | |
| WNMG080412E-4U | | | ◆◆ | | | ◆◆ | | | | | | | | | | |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Grades | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |

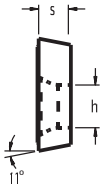
Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# WPMT




| Dimensions for WPMT | | | | | | | |
|---|---|---|---|---|---|---|---|
| Size | d mm | l mm | s mm | r mm | m mm | $m_1$ mm | h mm |
| 020102 | 3,97 | 2,92 | 1,59 | 0,20 | 0,99 | - | 1,95 |
| 050304 | 7,94 | 5,43 | 3,18 | 0,40 | 1,98 | - | 3,40 |

## 61 Geometry

| Grades | CVD COATED | | | | | | | PVD COATED | | | | | | UNCOATED | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A250 | A05040 | A04030 | A0706 | A0400 | A01519 | A037 | 751 | 750 | 752 | 750S | 4064 | 751S | PH21 | PH1 | PH2 |
| ISO GRADE DESIGNATION | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HC | HW | HF | HF |
| Part Number ISO | | | | | | | | | | | | | | | | |
| WPMT020102E-61 | | | | | | | | | | | | | ◆ | | | |
| WPMT050304E-61 | | | | | | | | | | | | | ◆ | | | |

Indicates stocked item and material application range.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

## Failure Analysis

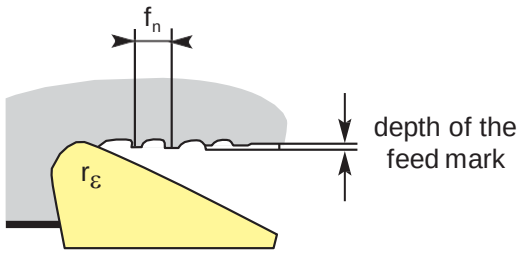
| Cause | Correction | Failure |
|---|---|---|
| **Intermittent heating of the cutting edge. High speed, high volume metal removal.** | **A** Use heat resistant grades with increased TaC.<br>**B** Use positive rake tools.<br>**C** Increase nose radius.<br>**D** Reduce speed, feed or depth of cut.<br>**E** Avoid use of coolant. | <br>Thermal Cracking |
| **Cutting tool excessively brittle. Tool too hard for application conditions.** | **A** Use tougher grade with higher colbalt content.<br>**B** Use negative rake angle inserts.<br>**C** Use larger nose radius.<br>**D** Use increased edge land.<br>**E** Increase cutting speed. | <br>Chipping |
| **Cutting tool too soft. Machine speed too fast.** | **A** Use harder, more wear resistant grade.<br>**B** Reduce cutting speed.<br>**C** Increase feed.<br>**D** Use coolant. | <br>Excessive Flank Wear |
| **Notching occurs at depth of cut line. Usually due to work hardened surface, scale or abrasion.** | **A** Increase approach angle to maximum.<br>**B** Use a larger corner radius for shallow cuts.<br>**C** Reduce cutting speed and feed.<br>**D** Vary depth of cut. | <br>Notching |
| **Cutting speed too slow for material being machined.** | **A** Increase cutting speed.<br>**B** Use friction reducing grade ie. TiAlN grade.<br>**C** Use high lubricity coolant. | <br>Built-Up-Edge |
| **Heavy feeds or higher cutting speeds.** | **A** Reduce cutting speed.<br>**B** Reduce feed.<br>**C** Use a harder grade.<br>**D** Use more heat resistant grade. | <br>Deformation |
| **Excessive heat and pressure welding of chip to rake.** | **A** Use a harder grade.<br>**B** Reduce speed.<br>**C** Reduce feed. | <br>Crater Wear |

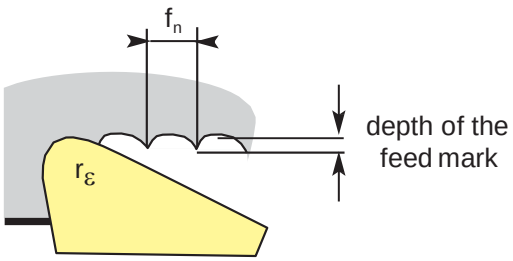
## Surface Finish

The radius of the insert has a significant role to play in the quality of the surface finish, which is directly in relation to the feed rate ($f_n$). With a larger radius, better surface finishes can be maintained at higher feeds. The use of a big radius gives a larger surface contact area and causes an increase in power and cutting force.

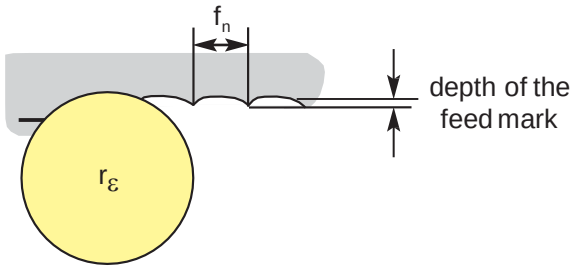
For roughing operations, it is preferable to choose a large radius to ensure corner strength of the insert. However, for some materials it is preferable to use a smaller radius to maintain a softer cut. The insert is more fragile but can qualify for operations that are sensitive to vibrations.

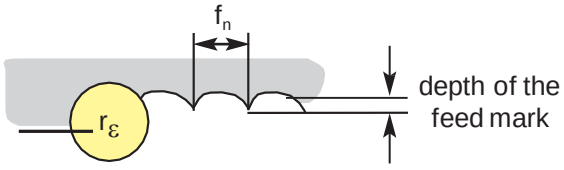
Generally an insert is used with a maximum feed equal to half its radius. The minimum feed is related to edge preparation or to the start of its chip control. An increase in cutting speed can also contribute to surface quality.




For a given radius:
The greater the waviness of machined surface, the greater the feed rate.




For a given feed rate:
The lower the waviness of machined surface, the greater the radius.

**The formula to calculate the feed rate:**

$$f_n = \sqrt{\frac{R_{max} \times 8}{r_\varepsilon \ 1000}}$$

$$R_{max} = \frac{f_n^2}{8 \times r_\varepsilon} \times 1000 \ (\mu m)$$

**The mean value $R_a$, can be calculated with following formula:**

$$R_a = \frac{f_n^2 \times 50}{r_\varepsilon}$$

| Surface finish $R_a$ value (µm) | Nose radius, $r_\varepsilon$ (mm) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0,2 | 0,4 | 0,8 | 1,2 | 1,6 | 2,4 | 3,2 |
| | Feedrate, $f_n$ (mm/rev) | | | | | | |
| 0,6 | 0,05 | 0,07 | 0,10 | 0,12 | 0,14 | 0,17 | 0,20 |
| 1,6 | 0,08 | 0,12 | 0,16 | 0,20 | 0,23 | 0,29 | 0,32 |
| 3,2 | 0,12 | 0,16 | 0,23 | 0,29 | 0,33 | 0,40 | 0,46 |
| 6,3 | - | 0,23 | 0,33 | 0,40 | 0,47 | 0,57 | 0,66 |
| 8,0 | - | - | 0,40 | 0,49 | 0,57 | 0,69 | 0,80 |

Rmax = profile depth (µm)

$r_\varepsilon$ = nose radius (mm)

$f_n$ = feed (mm/rev)

## Surface Finish Comparison Chart

| $R_{max}$ | $R_a$ = CLA = AA | | RMS | | Operation |
|---|---|---|---|---|---|
| µm | µm | µinch | µm | µinch | |
| 1,6 | 0,30 | 11.8 | 0,33 | 13.1 | |
| 1,8 | 0,35 | 13.8 | 0,39 | 15.3 | |
| 2,0 | 0,40 | 15.7 | 0,44 | 17.4 | |
| 2,2 | 0,44 | 17.5 | 0,49 | 19.4 | |
| 2,4 | 0,49 | 19.2 | 0,54 | 21.3 | |
| 2,6 | 0,53 | 20.8 | 0,59 | 23.1 | |
| 2,8 | 0,58 | 22.7 | 0,64 | 25.2 | |
| 3,0 | 0,63 | 24.6 | 0,70 | 27.3 | |
| 3,5 | 0,71 | 27.8 | 0,79 | 30.9 | |
| 4,0 | 0,80 | 31.4 | 0,89 | 34.8 | |
| 4,5 | 0,90 | 35.2 | 1,00 | 39.1 | |
| 5,0 | 0,99 | 38.8 | 1,10 | 43.1 | |
| 6,0 | 1,20 | 47.2 | 1,30 | 52.4 | |
| 7,0 | 1,40 | 55.1 | 1,50 | 61.2 | |
| 8,0 | 1,60 | 63.0 | 1,80 | 70.0 | |
| 9,0 | 1,80 | 71.0 | 2,00 | 78.8 | |
| 10,0 | 2,00 | 79.0 | 2,20 | 87.7 | |
| 15,0 | 3,20 | 126.0 | 3,10 | 140.0 | |
| 20,0 | 4,40 | 173.0 | 4,90 | 192.0 | |
| 25,0 | 5,80 | 238.0 | 6,40 | 264.0 | |
| 27,0 | 6,30 | 247.0 | 7,00 | 274.0 | |
| 30,0 | 7,40 | 292.0 | 8,20 | 324.0 | |
| 35,0 | 8,80 | 346.0 | 9,80 | 384.0 | |
| 40,0 | 10,70 | 422.0 | 11,00 | 468.0 | |
| 45,0 | 12,50 | 485.0 | 13,90 | 538.0 | |
| 50,0 | 14,00 | 552.0 | 15,50 | 613.0 | |

FINE FINISHING

MEDIUM

ROUGHING

## Workpiece hardness and cutting speeds

**Difference of hardness (HBN):**
When the hardness of a workpiece is different from the value shown in the grade speed charts, multiply the cutting speed you have obtained by the factor below to calculate a new cutting speed.

Work-piece: Soft (Hardness of workpiece) Hard

| ISO/ANSI | 120HBN | 140HBN | 160HBN | 180HBN | 200HBN | 220HBN | 240HBN | 260HBN | 280HBN | 300HBN | 320HBN | 340HBN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | 1,42 | 1,25 | 1,13 | 1,0 | 0,93 | 0,86 | 0,75 | 0,71 | 0,66 | - | - | - |
| M | 1,40 | 1,22 | 1,10 | 1,0 | 0,93 | 0,86 | 0,80 | 0,70 | 0,69 | - | - | - |
| K | 1,40 | 1,34 | 1,30 | 1,25 | 1,20 | 1,10 | 1,05 | 1,0 | 0,94 | 0,90 | 0,85 | 0,82 |

## Comparison Between Different Hardness Scales

| Tensile strength | Vickers | Brinell | Rockwell | |
|---|---|---|---|---|
| N/mm² | HV | HBN | HRC | HRB |
| 255 | 80 | 76.0 | - | - |
| 270 | 85 | 80.7 | - | 41.0 |
| 285 | 90 | 85.5 | - | 48.0 |
| 305 | 95 | 90.2 | - | 52.0 |
| 320 | 100 | 95.0 | - | 56.2 |
| 350 | 110 | 105 | - | 62.3 |
| 385 | 120 | 114 | - | 66.7 |
| 415 | 130 | 124 | - | 71.2 |
| 450 | 140 | 133 | - | 75.0 |
| 480 | 150 | 143 | - | 78.7 |
| 510 | 160 | 152 | - | 81.7 |
| 545 | 170 | 162 | - | 85.0 |
| 575 | 180 | 171 | - | 87.5 |
| 610 | 190 | 181 | - | 89.5 |
| 640 | 200 | 190 | - | 91.5 |
| 660 | 205 | 195 | - | 92.5 |
| 675 | 210 | 199 | - | 93.5 |
| 690 | 215 | 204 | - | 94.0 |
| 705 | 220 | 209 | - | 95.0 |
| 720 | 225 | 214 | - | 96.0 |
| 740 | 230 | 219 | - | 96.7 |
| 770 | 240 | 228 | 20.3 | 98.1 |
| 800 | 250 | 238 | 22.2 | 99.5 |
| 820 | 255 | 242 | 23.1 | - |
| 835 | 260 | 247 | 24.0 | (101) |
| 850 | 265 | 252 | 24.8 | - |
| 865 | 270 | 257 | 25.6 | (102) |
| 900 | 280 | 266 | 27.1 | - |
| 930 | 290 | 276 | 28.5 | (105) |
| 950 | 295 | 280 | 29.2 | - |
| 965 | 300 | 285 | 29.8 | - |
| 995 | 310 | 295 | 31.0 | - |

| Tensile strength | Vickers | Brinell | Rockwell |
|---|---|---|---|
| N/mm² | HV | HBN | HRC |
| 1030 | 320 | 304 | 32.2 |
| 1060 | 330 | 314 | 33.3 |
| 1095 | 340 | 323 | 34.4 |
| 1125 | 350 | 333 | 35.5 |
| 1155 | 360 | 342 | 36.6 |
| 1190 | 370 | 352 | 37.7 |
| 1220 | 380 | 361 | 38.8 |
| 1255 | 390 | 371 | 39.8 |
| 1290 | 400 | 380 | 40.8 |
| 1320 | 410 | 390 | 41.8 |
| 1350 | 420 | 399 | 42.7 |
| 1385 | 430 | 409 | 43.6 |
| 1420 | 440 | 418 | 44.5 |
| 1485 | 460 | 437 | 46.1 |
| 1555 | 480 | 450 | 47.7 |
| 1595 | 490 | 457 | 48.4 |
| 1630 | 500 | 465 | 49.1 |
| 1665 | 510 | 474 | 49.8 |
| 1700 | 520 | 482 | 50.5 |
| 1740 | 530 | 489 | 51.1 |
| 1775 | 540 | 496 | 51.7 |
| 1810 | 550 | 503 | 52.3 |
| 1845 | 560 | 511 | 53.0 |
| 1880 | 570 | 520 | 53.6 |
| 1920 | 580 | 527 | 54.1 |
| 1955 | 590 | 533 | 54.7 |
| 1995 | 600 | 538 | 55.2 |
| 2030 | 610 | 543 | 55.7 |
| 2070 | 620 | 549 | 56.3 |
| 2105 | 630 | 555 | 56.8 |
| 2145 | 640 | 561 | 57.3 |
| 2180 | 650 | 568 | 57.8 |

HV = Vickers hardness
HBN = Brinell hardness
HRC = Rockwell hardness, C scale
HRB = Rockwell hardness, B scale

## Turning Terminology and Formulae

| ISO | Material | Rm and Hardness | Kc: N/mm² |
|---|---|---|---|
| P | Unalloyed Steels | 400-600 N/mm² 120-180 HBN | 2050 |
| | | 600-950 N/mm² 180-200 HBN | 2300 |
| | Alloyed Steels | 700-950 N/mm² 200-280 HBN | 2599 |
| | | 950-1200 N/MM² 280-355 HBN | 2851 |
| | | 1200-1400 N/mm² 355-415 HBN | 3172 |
| | Tool Steels | 1200-1400 N/mm² 355-415 HBN | 3895 |
| M | Stainless Steel | Austenitic + Ferritic 300 Series | 1847 |
| | | Martensitic 400 Series | 2599 |
| | | Refractory P.H. | 3199 |
| K | Cast Irons | Grey GG-Ft | 1200 |
| | | Spheroidal GGG-FGS | 1500 |
| | | Nodular GGGNi - L - N | 1600 |
| | | Malleable GTS - MN/MP | 1050 |
| N | Aluminium & Alloys | <16% Si 116HBN | 827 |
| | | >16% Si 92HBN | 965 |
| S | High Temperature Alloys | Iron Based | 2999 |
| | | Cobalt Based | 3799 |
| | | Nickel Based | 3500 |
| | | Titanium Based 425-456HBN | 1500 |

# Turning Terminology and Formulae

## Formulae

$V_c = \frac{D_m \times \pi \times n}{1000}$ **Cutting speed (m/min)**

$n = \frac{V_c \times 1000}{D_m \times \pi}$ **Spindle speed (rev/min)**

$P_c = \frac{V_c \times a_p \times f_n \times k_c}{60 \times 1000 \times \mu}$ **Power demand (kW)**

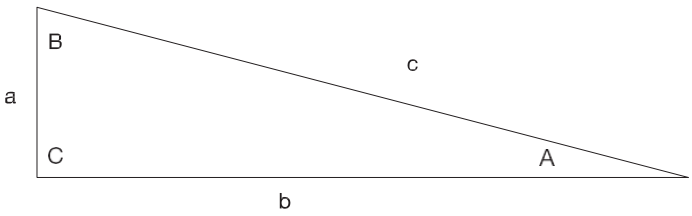
$Q_z = V_c \times f_n \times a_p$ **Metal removal (cm³/min)**

$T_c = \frac{l_m}{f_n \times n}$ **Period of engagement (min)**

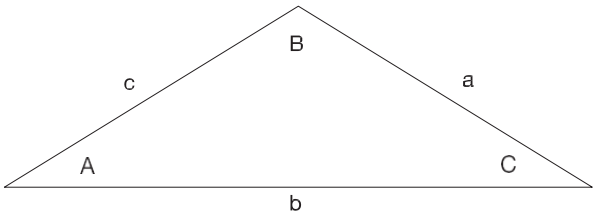
## Terminology

| | | | |
|---|---|---|---|
| $D_m$ | = | Machined diameter | mm |
| $V_c$ | = | Cutting speed | m/min |
| n | = | Spindle speed | rev/min |
| $T_c$ | = | Period of engagement | min |
| $Q_z$ | = | Metal removal | $cm^3$/min |
| $l_m$ | = | Machined length | mm |
| $P_c$ | = | Power demand | kW |
| $K_c$ | = | Specific cutting force | $N/mm^2$ |
| $f_n$ | = | Feed per revolution | mm/rev |
| $k_r$ | = | Cutting edge angle | degree |
| R max | = | Profile depth | µm |
| $r_\varepsilon$ | = | Insert nose radius | mm |
| $a_p$ | = | Depth of cut | mm |
| µ | = | Efficiency | |

# Trigonometrical Equivalents




| Dimension Given | Part to be Found | | | | |
|---|---|---|---|---|---|
| | A | B | a | b | c |
| a & c | sin A = a ÷ c | cos B = a ÷ c | | $b = \sqrt{c^2 - a^2}$ | |
| a & b | tan A = a ÷ b | cos B = a ÷ b | | | $c = \sqrt{a^2 + b^2}$ |
| c & b | cos A = b ÷ c | sin B = b ÷ c | $a = \sqrt{c^2 - b^2}$ | | |
| A & a | | B = 90º - A | | b = a x cot A | c = a ÷ sin A |
| A & b | | B = 90º - A | a = b x tan A | | c = b ÷ cos A |
| A & c | | B = 90º - A | a = c x sin A | b= c x cos A | |

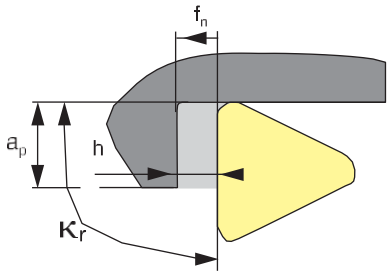



| Dimension Given | Parts to be Found | Formula |
|---|---|---|
| a b c | A | cos A = $b^2+c^2-a^2 \div 2bc$ |
| a b A | B | sin B = b x sin A ÷ a |
| a b A | C | C = 180 - (A + B) |
| a A B | b | b = a x sin B ÷ sin A |
| a A B | c | c = (a x sin C ÷ sin A) x (a x sin (180 - A - B) ÷ sin A) |
| a b C | B | B = 180 - (A + C) |

## Maximum Depth of Cut and Chip Thickness

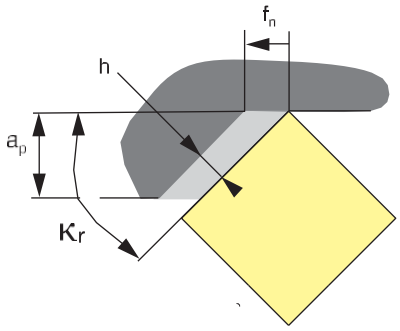
When deciding on the maximum depth of cut ($a_p$) for a given insert, the angle of the principal edge plays a significant role in the type of the chip formed. For an angle close to 90°, the thickness of the chip will be equal to the feed. In the other cases, it will be necessary to calculate it.

$h = f_n$



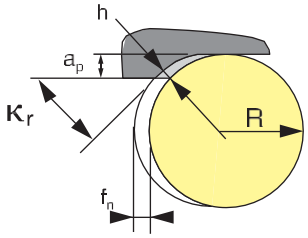

$n_r = 90°$

$h = f_n \sin [n_r]$




$n_r < 90°$

$h = 2f_n \sqrt{[(a_p/2R).(1-a_p/2R)]}$




$n_r = \cos\text{-}1.\ [1-a_p/R]$

The type of insert used plays a significant role in the rigidity of the cutting edge. A cutting edge angle of $n_r$ 75° or 45° allows for difficult machining operations, i.e. interrupted and heavy roughing, but reduces the capacity to machine profiles. The most robust insert shape is round and the most fragile standard insert is the 35°diamond (V).

The size and type of insert determines the maximum depth of cut. In general, it is advisable to select a cutting edge length in relation to the maximum depth of cut to be machined.

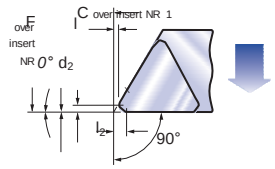
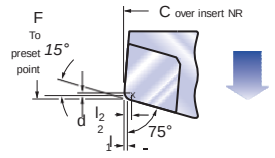
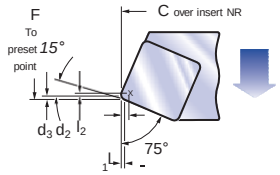
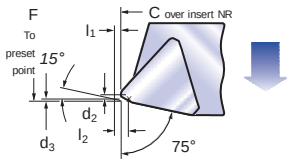
| Cutting Edge Length for a given depth of cut ($a_p$) and $n_r$ angle | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| A low depth of cut can still generate a large edge engagement | | | | | | | | | | |
| $n_r/a_p$ | 1,00 | 2,00 | 3,00 | 4,00 | 5,00 | 6,00 | 7,00 | 8,00 | 9,00 | 10,00 |
| 90 | 1,00 | 2,00 | 3,00 | 4,00 | 5,00 | 6,00 | 7,00 | 8,00 | 9,00 | 10,00 |
| 75 | 1,04 | 2,06 | 3,10 | 4,14 | 5,18 | 6,20 | 7,24 | 8,28 | 9,32 | 10,34 |
| 60 | 1,14 | 2,31 | 3,45 | 4,62 | 5,77 | 6,93 | 8,08 | 9,25 | 10,39 | 11,56 |
| 45 | 1,42 | 2,82 | 4,24 | 5,66 | 7,06 | 8,48 | 9,91 | 11,30 | 12,73 | 14,15 |
| 30 | 2,00 | 4,00 | 6,00 | 8,00 | 10,00 | 12,00 | 14,00 | 16,00 | 18,00 | 20,00 |

## Maximum Depth of Cut and Chip Thickness

To ensure safe machining operations the maximum theoretical edge engagement defined in the table below should not be exceeded.

| Maximum Depth of cut | | | |
|---|---|---|---|
| Symbol | Insert Type | | Max. edge length of cut |
| **R** | Round 360° |  | 0.4 x diameter |
| **S** | Square 90° |  | 2/3 x edge length |
| **T** | Triangular 60° |  | 1/2 x edge length |
| **E** | Rhombic 75° |  | 2/3 x edge length |
| **C** | Rhombic 80° |  | 2/3 x edge length |
| **D** | Rhombic 55° |  | 1/2 x edge length |
| **V** | Rhombic 35° |  | 1/4 x edge length |
| **W** | Hexagonal 80° |  | 1/4 x edge length |

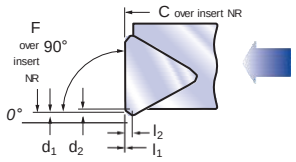
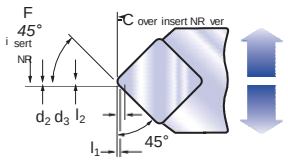
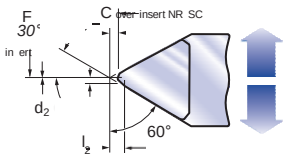
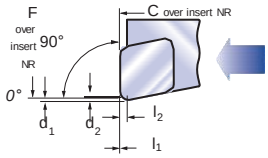
## Insert Radius Compensation

| Tool Style | Insert Style & Description | Radius | Dimensions | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | $d_1$ | $d_2$ | $d_3$ | $l_1$ | $l_2$ | $l_3$ |
| **A & G**   | **T style insert** Triangle, negative and positive rake, 90°/0° SCEA. | 0,4 | 0,00 | 0,396 | - | 0,289 | 0,688 | - |
| | | 0,8 | 0,00 | 0,792 | - | 0,582 | 1,374 | - |
| | | 1,2 | 0,00 | 1,191 | - | 0,871 | 2,062 | - |
| | | 1,6 | 0,00 | 1,587 | - | 1,163 | 2,748 | - |
| **B**   | **C style insert** 100° diamond, negative and positive rake, 75° / 15° SCEA. | 0,4 | - | 0,297 | 0,008 | 0,028 | 0,424 | - |
| | | 0,8 | - | 0,594 | 0,015 | 0,056 | 0,975 | - |
| | | 1,2 | - | 0,891 | 0,023 | 0,081 | 1,272 | - |
| | | 1,6 | - | 1,189 | 0,030 | 0,109 | 1,697 | - |
| **B**   | **S style insert** Square, negative and positive rake, 75° / 15° SCEA. | 0,4 | - | 0,279 | 0,023 | 0,089 | 0,485 | - |
| | | 0,8 | - | 0,561 | 0,048 | 0,178 | 0,973 | - |
| | | 1,2 | - | 0,841 | 0,071 | 0,267 | 1,458 | - |
| | | 1,6 | - | 1,123 | 0,096 | 0,356 | 1,943 | - |
| **B & R**   | **T Style insert** Triangle, negative and positive rake, 75° / 15° SCEA. | 0,4 | - | 0,206 | 0,099 | 0,371 | 0,767 | - |
| | | 0,8 | - | 0,411 | 0,198 | 0,739 | 1,534 | - |
| | | 1,2 | - | 0,617 | 0,297 | 1,109 | 2,301 | - |
| | | 1,6 | - | 0,823 | 0,396 | 1,478 | 3,066 | - |

$d_1$ - $1_1$ = SC (sharp corner) to NR (nose radius).
$d_2$ - $1_2$ = SC (sharp corner) to centerline NR (nose radius).
$d_3$ - $1_3$ = SC (sharp corner) to preset point.
$1_4$ = Over insert NR (nose radius) to preset point.

SCEA = Side cutting edge angle.
ECEA = End cutting edge angle.

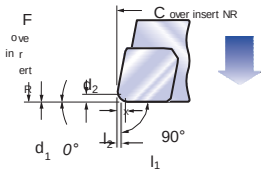
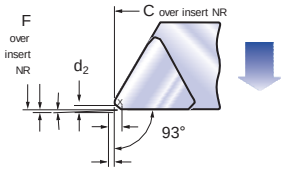
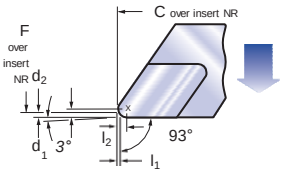
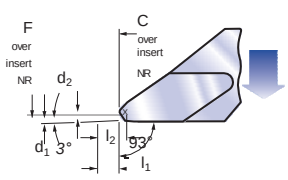
## Insert Radius Compensation

| Tool Style | Insert Style & Description | Radius | Dimensions | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | $d_1$ | $d_2$ | $d_3$ | $l_1$ | $l_2$ | $l_3$ |
| **C & F**   | **T Style insert**<br>Triangle, negative and positive rake, 90° / 0' ECEA. | 0,4 | 0,289 | 0,688 | - | 0,396 | - | - |
| | | 0,8 | 0,582 | 1,374 | - | 0,792 | - | - |
| | | 1,2 | 0,871 | 2,062 | - | 1,191 | - | - |
| | | 1,6 | 1,163 | 2,748 | - | 1,587 | - | - |
| **D & S**   | **S style insert**<br>Square, negative and positive rake, 45° / 45° ECEA and SCEA. | 0,4 | - | 0,00 | 1,651 | 1,651 | 0,561 | - |
| | | 0,8 | - | 0,00 | 0,328 | 0,328 | 1,122 | - |
| | | 1,2 | - | 0,00 | 0,492 | 0,492 | 1,684 | - |
| | | 1,6 | - | 0,00 | 1,163 | 1,163 | 2,245 | - |
| **E**   | **T style insert**<br>Triangle, negative and positive rake, 60° / 30° SCEA. | 0,4 | - | 0,00 | 0,229 | 0,396 | 0,792 | - |
| | | 0,8 | - | 0,00 | 0,457 | 0,792 | 1,587 | - |
| | | 1,2 | - | 0,00 | 0,686 | 1,191 | 2,382 | - |
| | | 1,6 | - | 0,00 | 0,917 | 1,587 | 3,175 | - |
| **F**   | **C style insert**<br>80° diamond, negative and positive rake, 90° / 0° ECEA. | 0,4 | 0,076 | 0,472 | - | 0,00 | 0,396 | - |
| | | 0,8 | 0,152 | 0,945 | - | 0,00 | 0,792 | - |
| | | 1,2 | 0,227 | 1,420 | - | 0,00 | 1,191 | - |
| | | 1,6 | 0,305 | 1,892 | - | 0,00 | 1,587 | - |

$d_1$ - $1_1$ = SC (sharp corner) to NR (nose radius).
$d_2$ - $1_2$ = SC (sharp corner) to centerline NR (nose radius).
$d_3$ - $1_3$ = SC (sharp corner) to preset point.
$1_4$ = Over insert NR (nose radius) to preset point.

SCEA = Side cutting edge angle.
ECEA = End cutting edge angle.

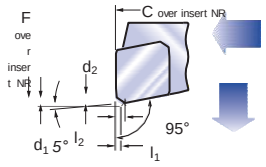
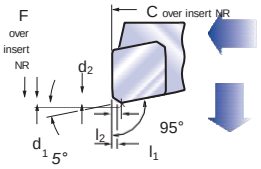
## Insert Radius Compensation

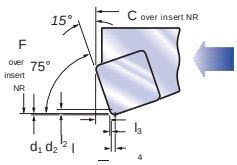
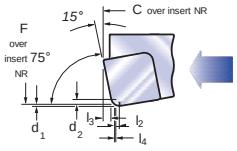
| Tool Style | Insert Style & Description | Radius | Dimensions | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | $d_1$ | $d_2$ | $d_3$ | $l_1$ | $l_2$ | $l_3$ |
| **G**   | **C style insert**<br>80° diamond, negative and positive rake, 90° / 0° ECEA. | 0,4 | 0,00 | 0,396 | - | 0,076 | 0,472 | - |
| | | 0,8 | 0,00 | 0,792 | - | 0,152 | 0,792 | - |
| | | 1,2 | 0,00 | 1,191 | - | 0,229 | 1,420 | - |
| | | 1,6 | 0,00 | 1,587 | - | 1,305 | 1,892 | - |
| **J**   | **T style insert**<br>Triangle, negative and positive rake, 93° / 3° rev. SCEA. | 0,4 | 0,035 | 0,432 | - | 0,269 | 0,066 | - |
| | | 0,8 | 0,071 | 0,864 | - | 0,538 | 1,331 | - |
| | | 1,2 | 0,107 | 1,298 | - | 0,808 | 1,996 | - |
| | | 1,6 | 1,189 | 1,730 | - | 1,074 | 2,662 | - |
| **J**   | **D style insert**<br>55° diamond, negative and positive rake, 93° / 3° rev. SCEA. | 0,4 | 0,038 | 0,437 | - | 0,343 | 0,742 | - |
| | | 0,8 | 0,075 | 0,871 | - | 0,688 | 1,481 | - |
| | | 1,2 | 0,117 | 1,318 | - | 1,031 | 1,222 | - |
| | | 1,6 | 0,157 | 1,745 | - | 1,374 | 2,962 | - |
| **J**   | **V style insert**<br>35° diamond, negative and positive rake, 93° / 3° rev. SCEA. | 0,4 | 0,066 | 0,462 | - | 0,838 | 1,237 | - |
| | | 0,8 | 0,129 | 0,924 | - | 1,679 | 2,471 | - |
| | | 1,2 | 0,195 | 1,387 | - | 2,517 | 3,708 | - |
| | | 1,6 | 0,262 | 1,849 | - | 3,358 | 4,945 | - |

$d_1$ - $1_1$ = SC (sharp corner) to NR (nose radius).
$d_2$ - $1_2$ = SC (sharp corner) to centerline NR (nose radius).
$d_3$ - $1_3$ = SC (sharp corner) to preset point.
$1_4$ = Over insert NR (nose radius) to preset point.

SCEA = Side cutting edge angle.
ECEA = End cutting edge angle.

## Insert Radius Compensation

| Tool Style | Insert Style & Description | Radius | Dimensions | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | $d_1$ | $d_2$ | $d_3$ | $l_1$ | $l_2$ | $l_3$ |
| **L**   | **C style insert**<br>80° diamond, negative and positive rake, 95° / 5° rev. ECEA and SCEA. | 0,4 | 0,041 | 0,437 | - | 0,041 | 0,437 | - |
| | | 0,8 | 0,079 | 0,874 | - | 0,079 | 0,874 | - |
| | | 1,2 | 0,119 | 1,311 | - | 0,119 | 1,311 | - |
| | | 1,6 | 0,157 | 1,747 | - | 0,157 | 1,747 | - |
| **L**   | **W style insert**<br>80° trigon, negative and positive rake, 95° / 5° rev. ECEA and SCEA. | 0,4 | 0,041 | 0,437 | - | 0,041 | 0,437 | - |
| | | 0,8 | 0,079 | 0,874 | - | 0,079 | 0,874 | - |
| | | 1,2 | 0,119 | 1,311 | - | 0,119 | 1,311 | - |
| | | 1,6 | 0,157 | 1,747 | - | 0,157 | 1,747 | - |

| Tool Style | Insert Style & Description | Radius | Dimensions | | | |
|---|---|---|---|---|---|---|
| | | | $d_1$ | $d_2$ | $l_2$ | $l_3$ |
| **K**   | **S style insert**<br>Square, negative and positive rake, 75° / 15° rev. ECEA. | 0,4 | 0,089 | 0,485 | 0,279 | 0,023 |
| | | 0,8 | 0,178 | 0,973 | 0,561 | 0,048 |
| | | 1,2 | 0,267 | 1,458 | 0,841 | 0,071 |
| | | 1,6 | 0,356 | 1,943 | 1,123 | 0,096 |
| **K**   | **C style insert**<br>80° diamond, negative and positive rake, 75° / 15° rev. ECEA. | 0,4 | 0,028 | 0,424 | 0,297 | 0,007 |
| | | 0,8 | 0,056 | 0,848 | 0,594 | 0,015 |
| | | 1,2 | 0,081 | 1,272 | 0,891 | 0,022 |
| | | 1,6 | 0,109 | 1,697 | 1,189 | 0,030 |

$d_1$ - $1_1$ = SC (sharp corner) to NR (nose radius).
$d_2$ - $1_2$ = SC (sharp corner) to centerline NR (nose radius).
$d_3$ - $1_3$ = SC (sharp corner) to preset point.
$1_4$ = Over insert NR (nose radius) to preset point.

SCEA = Side cutting edge angle.
ECEA = End cutting edge angle.



## 5 Thread Form

Partial Profile

| | | |
|---|---|---|
| 60° | **60** | |
| 55° | **55** | |

Full Profile

| | | |
|---|---|---|
| 45°/7° | **ABUTT** | |
| 29° | **ACME** | |
| 60° | **API RD** | |
| 60° | **API** | |
| 47,5° | **BA** | |
| 45°/7° | **BBUTT** | |
| 55° | **BSPT** | |
| 3°/10° | **BUTT** | |
| 12° | **ELC** | |
| 60° | **ISO** | |

Full Profile

| | | |
|---|---|---|
| 60° | **MJ** | |
| 60° | **NPT** | |
| 60° | **NPTF** | |
| 60° | **PAC** | |
| 80° | **PG** | |
| 30° | **RD** | |
| 3°/30° | **SAGE** | |
| 29° | **STACME** | |
| 30° | **TR** | |
| 60° | **UN** | |
| 60° | **UNJ** | |
| 3°/10° | **VAM** | |
| 55° | **W** | |

## 6 Other

| SC | M | T | Z |
|---|---|---|---|
| Swarf control style | Multi-tooth style and number of teeth | | |

## 7 Type of Grade

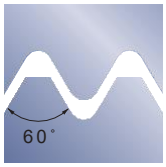
**SFZ/SP4036** Coated PVD

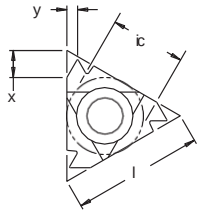
For grade descriptions, refer to page: 271

# 60° partial profile

## *External* Partial Profile 60° Form

For Unified & I.S.O metric thread forms

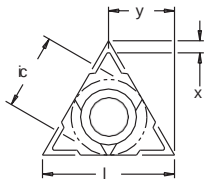



| Right Hand Inserts | | | | | | |
|---|---|---|---|---|---|---|
| Size | Description | Pitch Range mm | T.P.I Range | Nose Radius mm | X mm | Y mm |
| 11 | 11ERA60 | 0,5 - 1,5 | 48 - 16 | 0,07 | 0,8 | 0,9 |
| 16 | 16ERA60 | 0,5 - 1,5 | 48 - 16 | 0,09 | 0,8 | 0,9 |
| | 16ERG60 | 1,75 - 3,5 | 14 - 8 | 0,15 | 1,2 | 1,7 |
| | 16ERAG60 | 0,5 - 3,0 | 48 - 8 | 0,10 | 1,2 | 1,7 |
| 22 | 22ERN60 | 3,5 - 5.0 | 7 - 5 | 0,48 | 1,7 | 2,5 |
| 27 | 27ERQ60 | 5,5 - 6,0 | 4.5 - 4 | 0,79 | 2,6 | 3,1 |

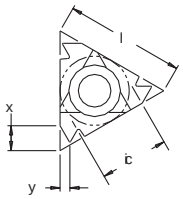
| Left Hand Inserts |
|---|
| Description |
| 11ELA60 |
| 16ELA60 |
| 16ELG60 |
| 16ELAG60 |
| 22ELN60 |
| 27ELQ60 |

| U Style Inserts | | | | | | |
|---|---|---|---|---|---|---|
| Size | Description | Pitch Range mm | T.P.I Range | Nose Radius mm | X mm | Y mm |
| 22 | 22EILRU60 | 5,5 - 8,0 | 4.5 - 3.25 | 0,79 | 0,6 | 11,0 |
| 27 | 27EILRU60 | 6,5 - 9,0 | 4 - 2.75 | 0,85 | 1,0 | 13,7 |




## *Internal* Partial Profile 60° Form

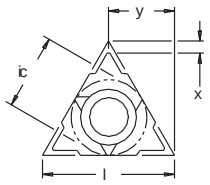
For Unified & I.S.O metric thread forms




| Right Hand Inserts | | | | | | |
|---|---|---|---|---|---|---|
| Size | Description | Pitch Range mm | T.P.I Range | Nose Radius mm | X mm | Y mm |
| 6 | 06IRA60 | 0,5 - 1,25 | 48 - 20 | 0,07 | 0,8 | 0,9 |
| 8 | 08IRA60 | 0,5 - 1,5 | 48 - 16 | 0,09 | 0,8 | 0,9 |
| 11 | 11IRA60 | 0,5 - 1,5 | 48 - 16 | 0,15 | 1,2 | 1,7 |
| 16 | 16IRA60 | 0,5 - 1,5 | 48 - 16 | 0,10 | 1,2 | 1,7 |
| | 16IRG60 | 1,75 - 3,0 | 14 - 8 | 0,15 | 1,2 | 1,7 |
| | 16IRAG60 | 0,5 - 3,0 | 48 - 8 | 0,10 | 1,2 | 1,7 |
| 22 | 22IRN60 | 3,5 - 5.0 | 7 - 5 | 0,32 | 1,7 | 2,5 |
| 27 | 27IRQ60 | 5,5 - 6,0 | 4.5 - 4 | 0,45 | 2,6 | 3,1 |

| Left Hand Inserts |
|---|
| Description |
| - |
| 08ILA60 |
| 11ILA60 |
| 16ILA60 |
| 16ILG60 |
| 16ILAG60 |
| 22ILN60 |
| 27ILQ60 |

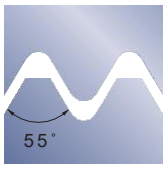
| U Style Inserts | | | | | | |
|---|---|---|---|---|---|---|
| Size | Description | Pitch Range mm | T.P.I Range | Nose Radius mm | X mm | Y mm |
| 8 | 08ILRU60 | 1,75 - 2,0 | 14 - 11 | 0,15 | 0,8 | 4,0 |

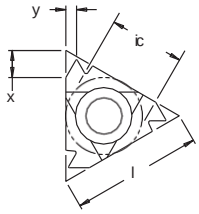



The left hand inserts table includes the same size, pitch range, T.P.I range, nose radius and X, Y information as the right hand inserts table.

## *External* Partial Profile 55° Form

For British Standard Whitworth & British Standard Parallel Pipe




### Right Hand Inserts

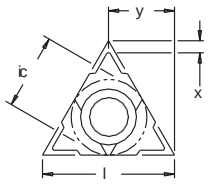
| Size | Description | Pitch Range mm | T.P.I Range | Nose Radius mm | X mm | Y mm |
|---|---|---|---|---|---|---|
| 11 | 11ERA55 | 0,5 - 1,5 | 48 - 16 | 0,07 | 0,8 | 0,9 |
| 16 | 16ERA55 | 0,5 - 1,5 | 48 - 16 | 0,07 | 0,8 | 0,9 |
| | 16ERG55 | 1,75 - 3,0 | 14 - 8 | 0,25 | 1,2 | 1,7 |
| | 16ERAG55 | 0,5 - 3,0 | 48 - 8 | 0,07 | 1,2 | 1,7 |
| 22 | 22ERN55 | 3,5 - 5,0 | 7 - 5 | 0,52 | 1,7 | 2,5 |
| 27 | 27ERQ55 | 5,5 - 6,0 | 4.5 - 4 | 0,82 | 2,6 | 3,1 |

### Left Hand Inserts

| Description |
|---|
| 11ELA55 |
| 16ELA55 |
| 16ELG55 |
| 16ELAG55 |
| 22ELN55 |
| 27ELQ55 |

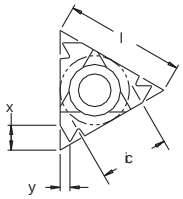
### U Style Inserts

| Size | Description | Pitch Range mm | T.P.I Range | Nose Radius mm | X mm | Y mm |
|---|---|---|---|---|---|---|
| 22 | 22EILRU55 | 5,5 - 8,0 | 4.5 - 3.25 | 0,82 | 0,9 | 11,0 |
| 27 | 27EILRU55 | 6,5 - 9,0 | 4 - 2.75 | 0,97 | 1,2 | 13,7 |




## *Internal* Partial Profile 55° Form

For British Standard Whitworth & British Standard Parallel Pipe




### Right Hand Inserts

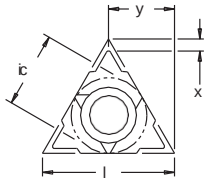
| Size | Description | Pitch Range mm | T.P.I Range | Nose Radius mm | X mm | Y mm |
|---|---|---|---|---|---|---|
| 6 | 06IRA55 | 0,5 - 1,25 | 48 - 20 | 0,07 | 0,6 | 0,6 |
| 8 | 08IRA55 | 0,5 - 1,5 | 48 - 16 | 0,07 | 0,6 | 0,7 |
| 11 | 11IRA55 | 0,5 - 1,5 | 48 - 16 | 0,07 | 0,8 | 0,9 |
| 16 | 16IRA55 | 0,5 - 1,5 | 48 - 16 | 0,07 | 0,8 | 0,9 |
| | 16IRG55 | 1,75 - 3,0 | 14 - 8 | 0,13 | 1,2 | 1,7 |
| | 16IRAG55 | 0,5 - 3,0 | 48 - 8 | 0,07 | 1,2 | 1,7 |
| 22 | 22IRN55 | 3,5 - 5,0 | 7 - 5 | 0,52 | 1,7 | 2,5 |
| 27 | 27IRQ55 | 5,5 - 6,0 | 4.5 - 4 | 0,82 | 2,6 | 3,1 |

### Left Hand Inserts

| Description |
|---|
| - |
| 08ILA55 |
| 11ILA55 |
| 16ILA55 |
| 16ILG55 |
| 16ILAG55 |
| 22ILN55 |
| 27ILQ55 |

### U Style Inserts

| Size | Description | Pitch Range mm | T.P.I Range | Nose Radius mm | X mm | Y mm |
|---|---|---|---|---|---|---|
| 8 | 08ILRU55 | 1,75 - 2,0 | 14 - 11 | 0,25 | 0,8 | 4,0 |

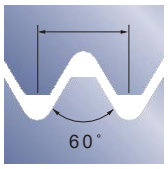


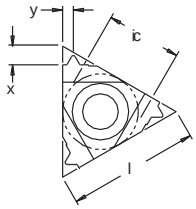

The left hand inserts table includes the same size, pitch range, T.P.I range, nose radius and X, Y information as the right hand inserts table.

## *External* ISO

Standard reference: I.S.O 262 (DIN 13)

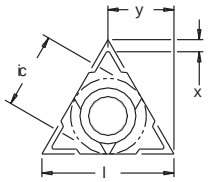
Tolerance class: 6g / 6H




| Right Hand Inserts | | | | | | Left Hand Inserts |
|---|---|---|---|---|---|---|
| Size | Description | Pitch mm | Nose Radius mm | X mm | Y mm | Description |
| 11 | **11ER0,35ISO** | 0,35 | 0,06 | 0,8 | 0,4 | **11EL0,35ISO** |
| | **11ER0,4ISO** | 0,4 | 0,07 | 0,7 | 0,4 | **11EL0,4ISO** |
| | **11ER0,45ISO** | 0,45 | 0,08 | 0,7 | 0,4 | **11EL0,45ISO** |
| | **11ER0,5ISO** | 0,5 | 0,08 | 0,6 | 0,6 | **11EL0,5ISO** |
| | **11ER0,6ISO** | 0,6 | 0,09 | 0,6 | 0,6 | **11EL0,6ISO** |
| | **11ER0,7ISO** | 0,7 | 0,10 | 0,6 | 0,6 | **11EL0,7ISO** |
| | **11ER0,75ISO** | 0,75 | 0,10 | 0,6 | 0,6 | **11EL0,75ISO** |
| | **11ER0,8ISO** | 0,8 | 0,13 | 0,6 | 0,6 | **11EL0,8ISO** |
| | **11ER1,0ISO** | 1,0 | 0,14 | 0,7 | 0,7 | **11EL1,0ISO** |
| | **11ER1,25ISO** | 1,25 | 0,18 | 0,8 | 0,9 | **11EL1,25ISO** |
| | **11ER1,5ISO** | 1,5 | 0,22 | 0,8 | 1,0 | **11EL1,5ISO** |
| | **11ER1,75ISO** | 1,75 | 0,25 | 0,8 | 1,1 | **11EL1,75ISO** |
| | **11ER2,0ISO** | 2,0 | 0,29 | 0,8 | 0,9 | **11EL2,0ISO** |
| 16 | **16ER0,35ISO** | 0,35 | 0,06 | 0,8 | 0,4 | **16EL0,35ISO** |
| | **16ER0,4ISO** | 0,4 | 0,07 | 0,7 | 0,4 | **16EL0,4ISO** |
| | **16ER0,45ISO** | 0,45 | 0,08 | 0,7 | 0,4 | **16EL0,45ISO** |
| | **16ER0,5ISO** | 0,5 | 0,08 | 0,6 | 0,6 | **16EL0,5ISO** |
| | **16ER0,6ISO** | 0,6 | 0,09 | 0,6 | 0,6 | **16EL0,6ISO** |
| | **16ER0,7ISO** | 0,7 | 0,10 | 0,6 | 0,6 | **16EL0,7ISO** |
| | **16ER0,75ISO** | 0,75 | 0,10 | 0,6 | 0,6 | **16EL0,75ISO** |
| | **16ER0,8ISO** | 0,8 | 0,13 | 0,6 | 0,6 | **16EL0,8ISO** |
| | **16ER1,0ISO** | 1,0 | 0,14 | 0,7 | 0,7 | **16EL1,0ISO** |
| | **16ER1,25ISO** | 1,25 | 0,18 | 0,8 | 0,9 | **16EL1,25ISO** |
| | **16ER1,5ISO** | 1,5 | 0,22 | 0,8 | 1,0 | **16EL1,5ISO** |
| | **16ER1,75ISO** | 1,75 | 0,25 | 0,9 | 1,2 | **16EL1,75ISO** |
| | **16ER2,0ISO** | 2,0 | 0,29 | 1,0 | 1,3 | **16EL2,0ISO** |
| | **16ER2,5ISO** | 2,5 | 0,36 | 1,1 | 1,5 | **16EL2,5ISO** |
| | **16ER3,0ISO** | 3,0 | 0,46 | 1,2 | 1,6 | **16EL3,0ISO** |
| 22 | **22ER3,5ISO** | 3,5 | 0,53 | 1,6 | 2,3 | **22EL3,5ISO** |
| | **22ER4,0ISO** | 4,0 | 0,61 | 1,6 | 2,3 | **22EL4,0ISO** |
| | **22ER4,5ISO** | 4,5 | 0,68 | 1,7 | 2,4 | **22EL4,5ISO** |
| | **22ER5,0ISO** | 5,0 | 0,76 | 1,7 | 2,5 | **22EL5,0ISO** |
| 27 | **27ER5,5ISO** | 5,5 | 0,79 | 1,9 | 2,7 | **27EL5,5ISO** |
| | **27ER6,0ISO** | 6,0 | 0,89 | 2,0 | 2,9 | **27EL6,0ISO** |

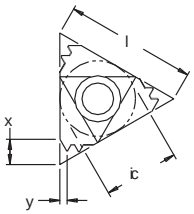
| U Style Inserts | | | | | |
|---|---|---|---|---|---|
| Size | Description | Pitch mm | Nose Radius mm | X mm | Y mm |
| 22 | **22ELRU5,5ISO** | 5,5 | 0,79 | 2,3 | 11,0 |
| | **22ELRU6,0ISO** | 6,0 | 0,87 | 2,6 | 11,0 |
| 27 | **27ELRU8,0ISO** | 8,0 | 1,15 | 2,4 | 13,7 |




The left hand inserts table includes the same size, pitch, nose radius and X, Y information as the right hand inserts table.

## Multi Tooth

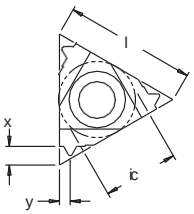
| Size | Description | Pitch mm | X mm | Y mm |
|---|---|---|---|---|
| 16 | 16IR1,0ISO3M | 1,0 | 2,6 | - |
| | 16IR1,5ISO2M | 1,5 | 1,6 | 2,4 |
| 22 | 22IR1,5ISO3M | 1,5 | 2,4 | 3,8 |
| | 22IR2,0ISO2M | 2,0 | 3,0 | - |
| | 22IR2,0ISO3M | 2,0 | 4,9 | - |
| 27 | 27IR3,0ISO2M | 3,0 | 4,3 | - |




## *Internal* ISO

Standard reference: I.S.O 262 (DIN 13)

Tolerance class: 6g / 6H



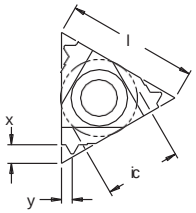

## Right Hand Inserts

| Size | Description | Pitch mm | Nose Radius mm | X mm | Y mm |
|---|---|---|---|---|---|
| 6 | 06IR0.5ISO | 0,5 | 0,04 | 0,6 | 0,5 |
| | 06IR0.75ISO | 0,75 | 0,06 | 0,6 | 0,5 |
| | 06IR1.0ISO | 1,0 | 0,08 | 0,6 | 0,6 |
| | 06IR1.25ISO | 1,25 | 0,10 | 0,6 | 0,7 |
| 8 | 08IR0.5ISO | 0,5 | 0,06 | 0,6 | 0,5 |
| | 08IR0.75ISO | 0,75 | 0,06 | 0,6 | 0,5 |
| | 08IR1.0ISO | 1,0 | 0,11 | 0,6 | 0,6 |
| | 08IR1.25ISO | 1,25 | 0,10 | 0,6 | 0,7 |
| | 08IR1.5ISO | 1,5 | 0,11 | 0,6 | 1,0 |
| | 08IR1.75ISO | 1,75 | 0,13 | 0,6 | 1,0 |
| 11 | 11IR0.35ISO | 0,35 | 0,03 | 0,8 | 0,3 |
| | 11IR0.4ISO | 0,4 | 0,04 | 0,8 | 0,4 |
| | 11IR0.45ISO | 0,45 | 0,04 | 0,8 | 0,4 |
| | 11IR0.5ISO | 0,5 | 0,04 | 0,6 | 0,6 |
| | 11IR0.6ISO | 0,6 | 0,05 | 0,6 | 0,6 |
| | 11IR0.7ISO | 0,7 | 0,06 | 0,6 | 0,6 |
| | 11IR0.75ISO | 0,75 | 0,06 | 0,6 | 0,6 |
| | 11IR0.8ISO | 0,8 | 0,06 | 0,6 | 0,6 |
| | 11IR1.0ISO | 1,0 | 0,08 | 0,6 | 0,7 |
| | 11IR1.25ISO | 1,25 | 0,10 | 0,8 | 0,8 |
| | 11IR1.5ISO | 1,5 | 0,11 | 0,8 | 1,0 |
| | 11IR1.75ISO | 1,75 | 0,13 | 0,8 | 1,0 |
| | 11IR2.0ISO | 2,0 | 0,14 | 0,8 | 1,1 |
| | 11IR2.5ISO | 2,5 | 0,18 | 0,8 | 1,3 |
| 16 | 16IR0.35ISO | 0,35 | 0,03 | 0,8 | 0,3 |
| | 16IR0.4ISO | 0,4 | 0,04 | 0,8 | 0,4 |
| | 16IR0.45ISO | 0,45 | 0,04 | 0,8 | 0,4 |
| | 16IR0.5ISO | 0,5 | 0,04 | 0,6 | 0,6 |
| | 16IR0.6ISO | 0,6 | 0,05 | 0,6 | 0,6 |
| | 16IR0.7ISO | 0,7 | 0,06 | 0,6 | 0,6 |

## Left Hand Inserts

| Description |
|---|
| - |
| - |
| - |
| - |
| 08IL0.5ISO |
| 08IL0.75ISO |
| 08IL1.0ISO |
| 08IL1.25ISO |
| 08IL1.5ISO |
| 08IL1.75ISO |
| 11IL0.35ISO |
| 11IL0.4ISO |
| 11IL0.45ISO |
| 11IL0.5ISO |
| 11IL0.6ISO |
| 11IL0.7ISO |
| 11IL0.75ISO |
| 11IL0.8ISO |
| 11IL1.0ISO |
| 11IL1.25ISO |
| 11IL1.5ISO |
| 11IL1.75ISO |
| 11IL2.0ISO |
| 11IL2.5ISO |
| 16IL0.35ISO |
| 16IL0.4ISO |
| 16IL0.45ISO |
| 16IL0.5ISO |
| 16IL0.6ISO |
| 16IL0.7ISO |

The left hand inserts table includes the same size, pitch, nose radius and X, Y information as the right hand inserts table.




## Right Hand Inserts

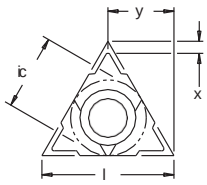
| Size | Description | Pitch mm | Nose Radius mm | X mm | Y mm |
|---|---|---|---|---|---|
| 16 | 16IR0.75ISO | 0,75 | 0,06 | 0,6 | 0,6 |
| | 16IR0.8ISO | 0,8 | 0,06 | 0,6 | 0,6 |
| | 16IR1.0ISO | 1,0 | 0,08 | 0,6 | 0,7 |
| | 16IR1.25ISO | 1,25 | 0,10 | 0,8 | 0,9 |
| | 16IR1.5ISO | 1,5 | 0,11 | 0,8 | 1,0 |
| | 16IR1.75ISO | 1,75 | 0,13 | 0,9 | 1,2 |
| | 16IR2.0ISO | 2,0 | 0,14 | 1,0 | 1,3 |
| | 16IR2.5ISO | 2,5 | 0,18 | 1,1 | 1,5 |
| | 16IR3.0ISO | 3,0 | 0,23 | 1,1 | 1,5 |
| | 16IR3.5ISO | 3,5 | 0,25 | 1,2 | 1,8 |
| 22 | 22IR3.5ISO | 3,5 | 0,25 | 1,6 | 2,3 |
| | 22IR4.0ISO | 4,0 | 0,33 | 1,6 | 2,3 |
| | 22IR4.5ISO | 4,5 | 0,36 | 1,6 | 2,4 |
| | 22IR5.0ISO | 5,0 | 0,39 | 1,6 | 2,6 |
| 27 | 27IR4.0ISO | 4,0 | 0,33 | 1,6 | 2,3 |
| | 27IR5.0ISO | 5,0 | 0,39 | 1,6 | 2,4 |
| | 27IR5.5ISO | 5,5 | 0,38 | 1,8 | 2,8 |
| | 27IR6.0ISO | 6,0 | 0,41 | 1,8 | 3,1 |

## Left Hand Inserts

| Description |
|---|
| 16IL0.75ISO |
| 16IL0.8ISO |
| 16IL1.0ISO |
| 16IL1.25ISO |
| 16IL1.5ISO |
| 16IL1.75ISO |
| 16IL2.0ISO |
| 16IL2.5ISO |
| 16IL3.0ISO |
| 16IL3.5ISO |
| 22IL3.5ISO |
| 22IL4.0ISO |
| 22IL4.5ISO |
| 22IL5.0ISO |
| 27IL4.0ISO |
| 27IL5.0ISO |
| 27IL5.5ISO |
| 27IL6.0ISO |

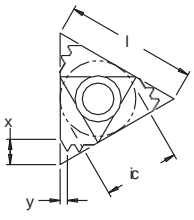
## U Style Inserts

| Size | Description | Pitch mm | Nose Radius mm | X mm | Y mm |
|---|---|---|---|---|---|
| 22 | 22ILRU5.5ISO | 5,5 | 0,38 | 2,4 | 11,0 |
| | 22ILRU6.0ISO | 6,0 | 0,41 | 2,1 | 11,0 |
| 27 | 27ILRU8.0ISO | 8,0 | 0,55 | 2,4 | 13,7 |




## Multi Tooth

| Size | Description | Pitch mm | X mm | Y mm |
|---|---|---|---|---|
| 16 | 16IR1.0ISO3M | 1,0 | 1,8 | 2,6 |
| | 16IR1.5ISO2M | 1,5 | 1,6 | 2,4 |
| 22 | 22IR1.5ISO3M | 1,5 | 2,5 | 3,8 |
| | 22IR2.0ISO2M | 2,0 | 2,1 | 3,1 |
| | 22IR2.0ISO3M | 2,0 | 3,2 | 5,1 |
| 27 | 27IR3.0IS02M | 3,0 | 3,0 | 4,6 |

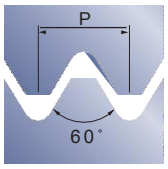


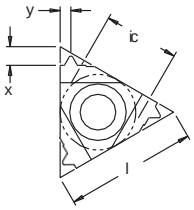

The left hand inserts table includes the same size, pitch, nose radius and X, Y information as the right hand inserts table.

## *External* UN

Standard reference: ANSI B1.1:74

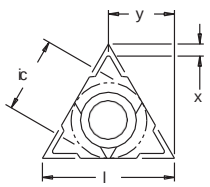
Tolerance class: 2A / 2B



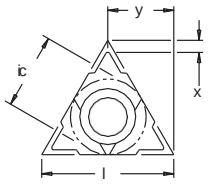

| Right Hand Inserts | | | | | | Left Hand Inserts |
|---|---|---|---|---|---|---|
| Size | Description | T.P.I | Nose Radius mm | X mm | Y mm | Description |
| 11 | 11ER40UN | 40 | 0,09 | 0,6 | 0,6 | 11EL40UN |
| | 11ER36UN | 36 | 0,11 | 0,6 | 0,6 | 11EL36UN |
| | 11ER32UN | 32 | 0,13 | 0,6 | 0,6 | 11EL32UN |
| | 11ER28UN | 28 | 0,14 | 0,6 | 0,7 | 11EL28UN |
| | 11ER27UN | 27 | 0,15 | 0,7 | 0,8 | 11EL27UN |
| | 11ER24UN | 24 | 0,17 | 0,7 | 0,8 | 11EL24UN |
| | 11ER20UN | 20 | 0,19 | 0,8 | 0,9 | 11EL20UN |
| | 11ER18UN | 18 | 0,20 | 0,8 | 1,0 | 11EL18UN |
| | 11ER16UN | 16 | 0,22 | 0,9 | 1,1 | 11EL16UN |
| | 11ER14UN | 14 | 0,25 | 1,0 | 1,2 | 11EL14UN |
| 16 | 16ER40UN | 40 | 0,09 | 0,6 | 0,6 | 16EL40UN |
| | 16ER36UN | 36 | 0,11 | 0,6 | 0,6 | 16EL36UN |
| | 16ER32UN | 32 | 0,13 | 0,6 | 0,6 | 16EL32UN |
| | 16ER28UN | 28 | 0,14 | 0,6 | 0,7 | 16EL28UN |
| | 16ER27UN | 27 | 0,15 | 0,7 | 0,8 | 16EL27UN |
| | 16ER24UN | 24 | 0,17 | 0,7 | 0,8 | 16EL24UN |
| | 16ER20UN | 20 | 0,18 | 0,8 | 0,9 | 16EL20UN |
| | 16ER18UN | 18 | 0,20 | 0,8 | 1,0 | 16EL18UN |
| | 16ER16UN | 16 | 0,22 | 0,9 | 1,1 | 16EL16UN |
| | 16ER14UN | 14 | 0,25 | 1,0 | 1,2 | 16EL14UN |
| | 16ER13UN | 13 | 0,28 | 1,0 | 1,3 | 16EL13UN |
| | 16ER12UN | 12 | 0,29 | 1,1 | 1,4 | 16EL12UN |
| | 16ER11UN | 11 | 0,33 | 1,1 | 1,5 | 16EL11UN |
| | 16ER10UN | 10 | 0,38 | 1,1 | 1,5 | 16EL10UN |
| | 16ER9UN | 9 | 0,38 | 1,2 | 1,7 | 16EL9UN |
| | 16ER8UN | 8 | 0,48 | 1,2 | 1,6 | 16EL8UN |
| 22 | 22ER8UN | 8 | 0,48 | 1,2 | 1,6 | 22EL8UN |
| | 22ER7UN | 7 | 0,53 | 1,6 | 2,3 | 22EL7UN |
| | 22ER6UN | 6 | 0,64 | 1,6 | 2,3 | 22EL6UN |
| | 22ER5UN | 5 | 0,76 | 1,7 | 2,5 | 22EL5UN |
| 27 | 27ER4.5UN | 4.5 | 0,82 | 1,9 | 2,7 | 27EL4.5UN |
| | 27ER4UN | 4 | 0,91 | 2,1 | 3,0 | 27EL4UN |

| U Style Inserts | | | | | |
|---|---|---|---|---|---|
| Size | Description | T.P.I | Nose Radius mm | X mm | Y mm |
| 22 | 22ELRU4.5UN | 4.5 | 0,82 | 2,0 | 11,0 |
| | 22ELRU4UN | 4 | 0,91 | 2,0 | 11,0 |
| 27 | 27ELRU3UN | 3 | 1,22 | 2,5 | 13,7 |




The left hand inserts table includes the same size, T.P.I, nose radius and X, Y information as the right hand inserts table.

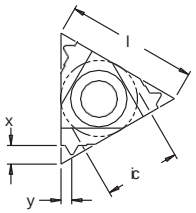
| M Style | | | | |
|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm |
| 16 | 16ER16UN2M | 16 | 1,7 | 2,5 |
| 22 | 22ER16UN3M | 16 | 2,6 | 4,1 |
| | 22ER12UN2M | 12 | 2,1 | 3,2 |
| | 22ER12UN3M | 12 | 3,4 | 5,3 |
| 27 | 27ER8UN2M | 8 | 3,2 | 5,0 |




## *Internal* UN

Standard reference: ANSI B1.1:74

Tolerance class: 2A / 2B




| Right Hand Inserts | | | | | |
|---|---|---|---|---|---|
| Size | Description | T.P.I | Nose Radius mm | X mm | Y mm |
| 6 | 06IR32UN | 32 | 0,06 | 0,8 | 0,5 |
| | 06IR28UN | 28 | 0,09 | 0,8 | 0,6 |
| | 06IR24UN | 24 | 0,09 | 0,7 | 0,6 |
| | 06IR20UN | 20 | 0,10 | 0,6 | 0,6 |
| | 06IR18UN | 18 | 0,11 | 0,6 | 0,7 |
| 8 | 08IR32UN | 32 | 0,06 | 0,6 | 0,5 |
| | 08IR28UN | 28 | 0,09 | 0,6 | 0,6 |
| | 08IR24UN | 24 | 0,09 | 0,6 | 0,6 |
| | 08IR20UN | 20 | 0,10 | 0,6 | 0,7 |
| | 08IR18UN | 18 | 0,11 | 0,6 | 0,7 |
| | 08IR16UN | 16 | 0,11 | 0,6 | 0,7 |
| | 08IR14UN | 14 | 0,15 | 0,6 | 0,8 |
| 11 | 11IR40UN | 40 | 0,05 | 0,6 | 0,6 |
| | 11IR36UN | 36 | 0,07 | 0,6 | 0,6 |
| | 11IR32UN | 32 | 0,09 | 0,6 | 0,6 |
| | 11IR28UN | 28 | 0,09 | 0,6 | 0,7 |
| | 11IR27UN | 27 | 0.09 | 0,7 | 0,8 |
| | 11IR24UN | 24 | 0,09 | 0,7 | 0,8 |
| | 11IR20UN | 20 | 0,10 | 0,8 | 0,9 |
| | 11IR18UN | 18 | 0,11 | 0,8 | 1,0 |
| | 11IR16UN | 16 | 0,11 | 0,9 | 1,1 |
| | 11IR14UN | 14 | 0,15 | 0,9 | 1,1 |
| | 11IR13UN | 13 | 0,17 | 0,8 | 1,0 |
| | 11IR12UN | 12 | 0,18 | 0,9 | 1,1 |
| | 11IR11UN | 11 | 0,18 | 0,8 | 1,1 |
| 16 | 16IR40UN | 40 | 0,05 | 0,6 | 0,6 |
| | 16IR36UN | 36 | 0,05 | 0,6 | 0,6 |
| | 16IR32UN | 32 | 0,06 | 0,6 | 0,6 |
| | 16IR28UN | 28 | 0,09 | 0,6 | 0,7 |

| Left Hand Inserts |
|---|
| Description |
| - |
| - |
| - |
| - |
| - |
| 08IL32UN |
| 08IL28UN |
| 08IL24UN |
| 08IL20UN |
| 08IL18UN |
| 08IL16UN |
| 08IL14UN |
| 11IL40UN |
| 11IL36UN |
| 11IL32UN |
| 11IL28UN |
| 11IL27UN |
| 11IL24UN |
| 11IL20UN |
| 11IL18UN |
| 11IL16UN |
| 11IL14UN |
| 11IL13UN |
| 11IL12UN |
| 11IL11UN |
| 16IL40UN |
| 16IL36UN |
| 16IL32UN |
| 16IL28UN |

The left hand inserts table includes the same size, T.P.I, nose radius and X, Y information as the right hand inserts table.

## Right Hand Inserts

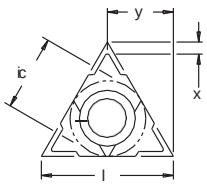
| Size | Description | T.P.I | Nose Radius mm | X mm | Y mm |
|---|---|---|---|---|---|
| | 16IR26UN | 26 | 0,09 | 0,7 | 0,8 |
| | 16IR24UN | 24 | 0,09 | 0,7 | 0,8 |
| | 16IR20UN | 20 | 0,10 | 0,8 | 0,9 |
| | 16IR18UN | 18 | 0,11 | 0,8 | 1,0 |
| | 16IR16UN | 16 | 0,11 | 0,9 | 1,1 |
| | 16IR14UN | 14 | 0,15 | 0,9 | 1,1 |
| | 16IR13UN | 13 | 0,17 | 1,0 | 1,3 |
| | 16IR12UN | 12 | 0,18 | 1,1 | 1,4 |
| | 16IR11.5UN | 11.5 | 0,18 | 1,1 | 1,5 |
| | 16IR11UN | 11 | 0,18 | 1,1 | 1,5 |
| | 16IR10UN | 10 | 0,20 | 1,1 | 1,5 |
| | 16IR9UN | 9 | 0,20 | 1,2 | 1,7 |
| | 16IR8UN | 8 | 0,24 | 1,1 | 1,5 |
| 22 | 22IR7UN | 7 | 0,29 | 1,6 | 2,3 |
| | 22IR6UN | 6 | 0,33 | 1,6 | 2,3 |
| | 22IR5UN | 5 | 0,37 | 1,6 | 2,3 |
| 27 | 27IR4.5UN | 4.5 | 0,42 | 1,7 | 2,4 |
| | 27IR4UN | 4 | 0,46 | 1,8 | 2,7 |

## Left Hand Inserts

| Description |
|---|
| 16IL26UN |
| 16IL24UN |
| 16IL20UN |
| 16IL18UN |
| 16IL16UN |
| 16IL14UN |
| 16IL13UN |
| 16IL12UN |
| 16IL11.5UN |
| 16IL11UN |
| 16IL10UN |
| 16IL9UN |
| 16IL8UN |
| 22IL7UN |
| 22IL6UN |
| 22IL5UN |
| 27IL4.5UN |
| 27IL4UN |

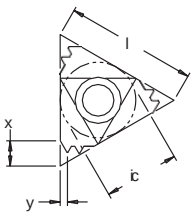
## U Style Inserts

| Size | Description | T.P.I | Nose Radius mm | X mm | Y mm |
|---|---|---|---|---|---|
| 8 | 08ILRU12UN | 12 | 0,18 | 0,9 | 4,0 |
| | 08ILRU11UN | 11 | 0,18 | 0,9 | 4,0 |
| 22 | 22ILRU4.5UN | 4.5 | 0,42 | 2,4 | 11,0 |
| | 22ILRU4UN | 4 | 0,46 | 2,4 | 11,0 |
| 27 | 27ILRU3UN | 3 | 0,62 | 2,7 | 13,7 |




## M Style Inserts

| Size | Description | T.P.I | X mm | Y mm |
|---|---|---|---|---|
| 16 | 16IR16UN2M | 16 | 1,7 | 2,5 |
| 22 | 22IR16UN3M | 16 | 2,6 | 4,1 |
| | 22IR12UN2M | 12 | 2,1 | 3,2 |
| | 22IR12UN3M | 12 | 3,4 | 5,3 |
| 27 | 27IR8UN2M | 8 | 3,2 | 5,0 |



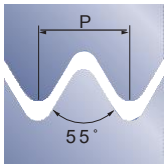

The left hand inserts table includes the same size, T.P.I, nose radius and X, Y information as the right hand inserts table.

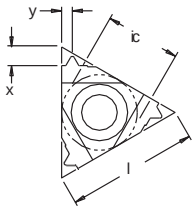
# Whitworth for BSW/BSF and BSP

## *External* Whitworth

Standard reference: I.S.O 228/1: 1982, B.S. 84:1956, DIN 259

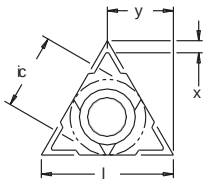
Tolerance class: Medium class A




| Right Hand Inserts | | | | | Left Hand Inserts |
|---|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm | Description |
| 11 | 11ER40W | 40 | 0,6 | 0,6 | 11EL40W |
| | 11ER36W | 36 | 0,6 | 0,6 | 11EL36W |
| | 11ER32W | 32 | 0,6 | 0,6 | 11EL32W |
| | 11ER28W | 28 | 0,6 | 0,7 | 11EL28W |
| | 11ER26W | 26 | 0,7 | 0,8 | 11EL26W |
| | 11ER24W | 24 | 0,7 | 0,8 | 11EL24W |
| | 11ER22W | 22 | 0,8 | 0,9 | 11EL22W |
| | 11ER20W | 20 | 0,8 | 0,9 | 11EL20W |
| | 11ER19W | 19 | 0,8 | 1,0 | 11EL19W |
| | 11ER18W | 18 | 0,8 | 1,0 | 11EL18W |
| | 11ER16W | 16 | 0,9 | 1,1 | 11EL16W |
| | 11ER14W | 14 | 0,9 | 1,1 | 11EL14W |
| 16 | 16ER40W | 40 | 0,6 | 0,6 | 16EL40W |
| | 16ER36W | 36 | 0,6 | 0,6 | 16EL36W |
| | 16ER32W | 32 | 0,6 | 0,6 | 16EL32W |
| | 16ER28W | 28 | 0,6 | 0,7 | 16EL28W |
| | 16ER26W | 26 | 0,7 | 0,8 | 16EL26W |
| | 16ER24W | 24 | 0,7 | 0,8 | 16EL24W |
| | 16ER22W | 22 | 0,8 | 0,9 | 16EL22W |
| | 16ER20W | 20 | 0,8 | 0,9 | 16EL20W |
| | 16ER19W | 19 | 0,8 | 1,0 | 16EL19W |
| | 16ER18W | 18 | 0,8 | 1,0 | 16EL18W |
| | 16ER16W | 16 | 0,9 | 1,1 | 16EL16W |
| | 16ER14W | 14 | 1,0 | 1,2 | 16EL14W |
| | 16ER12W | 12 | 1,1 | 1,4 | 16EL12W |
| | 16ER11W | 11 | 1,1 | 1,5 | 16EL11W |
| | 16ER10W | 10 | 1,1 | 1,5 | 16EL10W |
| | 16ER9W | 9 | 1,2 | 1,7 | 16EL9W |
| | 16ER8W | 8 | 1,2 | 1,5 | 16EL8W |
| 22 | 22ER8W | 8 | 1,6 | 2,3 | 22EL8W |
| | 22ER7W | 7 | 1,6 | 2,3 | 22EL7W |
| | 22ER6W | 6 | 1,6 | 2,3 | 22EL6W |
| | 22ER5W | 5 | 1,6 | 2,4 | 22EL5W |
| 27 | 27ER4.5W | 4.5 | 1,8 | 2,6 | 27EL4.5W |
| | 27ER4W | 4 | 2,0 | 2,9 | 27EL4W |

| U Style Inserts | | | | |
|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm |
| 16 | 16ER14W2M | 14 | 1,9 | 2,8 |
| 22 | 22ER14W3M | 14 | 2,9 | 4,6 |
| | 22ER11W2M | 11 | 2,3 | 3,5 |

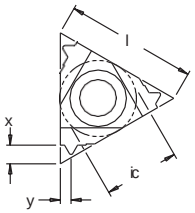



The left hand inserts table includes the same size, T.P.I and X, Y information as the right hand inserts table.

## *Internal* Whitworth

Standard reference: I.S.O 228/1 : 1982, B.S. 84:1956, DIN 259

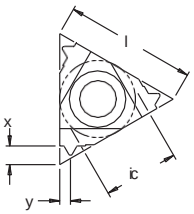
Tolerance class: Medium class A




| Right Hand Inserts | | | | | Left Hand Inserts |
|---|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm | Description |
| 6 | 06IR22W | 22 | 0,6 | 0,6 | - |
| | 06IR20W | 20 | 0,6 | 0,7 | - |
| | 06IR19W | 19 | 0,6 | 0,7 | - |
| | 06IR18W | 18 | 0,6 | 0,7 | - |
| 8 | 08IR28W | 28 | 0,6 | 0,6 | 08IL28W |
| | 08IR26W | 26 | 0,6 | 0,6 | 08IL26W |
| | 08IR24W | 24 | 0,6 | 0,7 | 08IL24W |
| | 08IR20W | 20 | 0,6 | 0,7 | 08IL20W |
| | 08IR19W | 19 | 0,6 | 0,7 | 08IL19W |
| | 08IR18W | 18 | 0,6 | 0,7 | 08IL18W |
| | 08IR16W | 16 | 0,6 | 0,7 | 08IL16W |
| 11 | 11IR40W | 40 | 0,6 | 0,6 | 11IL40W |
| | 11IR36W | 36 | 0,6 | 0,6 | 11IL36W |
| | 11IR32W | 32 | 0,6 | 0,6 | 11IL32W |
| | 11IR28W | 28 | 0,6 | 0,7 | 11IL28W |
| | 11IR26W | 26 | 0,7 | 0,8 | 11IL26W |
| | 11IR24W | 24 | 0,7 | 0,8 | 11IL24W |
| | 11IR22W | 22 | 0,8 | 0,9 | 11IL22W |
| | 11IR20W | 20 | 0,8 | 0,9 | 11IL20W |
| | 11IR19W | 19 | 0,8 | 1,0 | 11IL19W |
| | 11IR18W | 18 | 0,8 | 1,0 | 11IL18W |
| | 11IR16W | 16 | 0,9 | 1,1 | 11IL16W |
| | 11IR14W | 14 | 0,9 | 1,1 | 11IL14W |
| | 11IR12W | 12 | 1,0 | 1,1 | 11IL12W |
| | 11IR11W | 11 | 0,9 | 1,2 | 11IL11W |
| 16 | 16IR40W | 40 | 0,6 | 0,6 | 16IL40W |
| | 16IR36W | 36 | 0,6 | 0,6 | 16IL36W |
| | 16IR32W | 32 | 0,6 | 0,6 | 16IL32W |
| | 16IR28W | 28 | 0,6 | 0,7 | 16IL28W |
| | 16IR26W | 26 | 0,7 | 0,8 | 16IL26W |
| | 16IR24W | 24 | 0,7 | 0,8 | 16IL24W |
| | 16IR22W | 22 | 0,8 | 0,9 | 16IL22W |
| | 16IR20W | 20 | 0,8 | 0,9 | 16IL20W |
| | 16IR19W | 19 | 0,8 | 1,0 | 16IL19W |
| | 16IR18W | 18 | 0,8 | 1,0 | 16IL18W |
| | 16IR16W | 16 | 0,9 | 1,1 | 16IL16W |
| | 16IR14W | 14 | 1,0 | 1,2 | 16IL14W |
| | 16IR12W | 12 | 1,1 | 1,4 | 16IL12W |
| | 16IR11W | 11 | 1,1 | 1,5 | 16IL11W |
| | 16IR10W | 10 | 1,1 | 1,5 | 16IL10W |

The left hand inserts table includes the same size, T.P.I and X, Y information as the right hand inserts table.

# Whitworth for BSW/BSF and BSP




## Right Hand Inserts

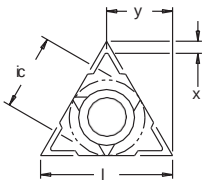
| Size | Description | T.P.I | X mm | Y mm |
|---|---|---|---|---|
| 16 | 16IR9W | 9 | 1,2 | 1,7 |
| | 16IR8W | 8 | 1,2 | 1,5 |
| 22 | 22IR7W | 7 | 1,6 | 2,3 |
| | 22IR6W | 6 | 1,6 | 2,3 |
| | 22IR5W | 5 | 1,7 | 2,4 |
| 27 | 27IR4.5W | 4.5 | 1,8 | 2,6 |
| | 27IR4W | 4 | 2,0 | 2,9 |

## Left Hand Inserts

| Description |
|---|
| 16IL9W |
| 16IL8W |
| 22IL7W |
| 22IL6W |
| 22IL5W |
| 27IL4.5W |
| 27IL4W |

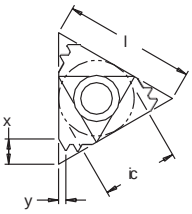
## U Style Inserts

| Size | Description | T.P.I | X mm | Y mm |
|---|---|---|---|---|
| 8 | 08ILRU14W | 14 | 1,0 | 4,0 |
| | 08ILRU12W | 12 | 0,9 | 4,0 |
| | 08ILRU11W | 11 | 0,9 | 4,0 |
| 22 | 22EILRU4.5W | 4.5 | 2,3 | 11,0 |
| | 22EILRU4W | 4 | 1,8 | 11,0 |
| 27 | 27EILRU3.5 | 3.5 | 2,1 | 13,7 |
| | 27EILRU3.25 | 3.25 | 2,0 | 13,7 |
| | 27EILRU3 | 3 | 2,3 | 13,7 |
| | 27EILRU2.75 | 2.75 | 2,4 | 13,7 |




## Multi Tooth

| Size | Description | T.P.I | X mm | Y mm |
|---|---|---|---|---|
| 16 | 16IR14W2M | 14 | 1,9 | 2,8 |
| 22 | 22IR14W3M | 14 | 2,9 | 4,6 |
| | 22IR11W2M | 11 | 2,3 | 3,5 |

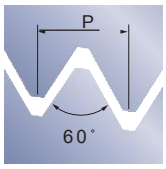


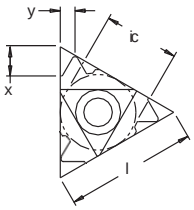

The left hand inserts table includes the same size, T.P.I and X, Y information as the right hand inserts table.

## *External* NPT

Standard reference: USAS B2.1 :1968

Tolerance class: Standard NPT




### Right Hand Inserts

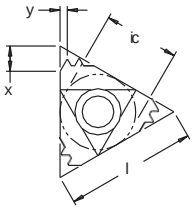
| Size | Description | T.P.I | X mm | Y mm |
|---|---|---|---|---|
| 11 | 11ER27NPT | 27 | 0,7 | 0,8 |
| | 11ER18NPT | 18 | 0,8 | 1,0 |
| | 11ER14NPT | 14 | 0,8 | 1,0 |
| 16 | 16ER27NPT | 27 | 0,7 | 0,8 |
| | 16ER18NPT | 18 | 0,8 | 1,0 |
| | 16ER14NPT | 14 | 0,9 | 1,2 |
| | 16ER11.5NPT | 11.5 | 1,1 | 1,5 |
| | 16ER8NPT | 8 | 1,3 | 1,8 |

### Left Hand Inserts

| Description |
|---|
| 11EL27NPT |
| 11EL18NPT |
| 11EL14NPT |
| 16EL27NPT |
| 16EL18NPT |
| 16EL14NPT |
| 16EL11.5NPT |
| 16EL8NPT |

### Multi Tooth

| Size | Description | T.P.I | X mm | Y mm |
|---|---|---|---|---|
| 22 | 22ER11,5NPT2M | 11.5 | 3,4 | 2,2 |
| 27 | 27ER11.5NPT3M | 11.5 | 3,5 | 5,6 |
| | 27ER8NPT2M | 8 | 2,9 | 4,7 |

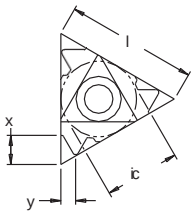



The left hand inserts table includes the same size, T.P.I and X, Y information as the right hand inserts table.

## *Internal* NPT

Standard reference: USAS B2.1 :1968

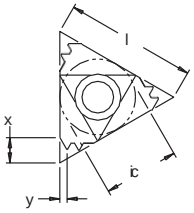
Tolerance class: Standard NPT




| Right Hand Inserts | | | | |
|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm |
| 6 | 06IR27NPT | 27 | 0,6 | 0,6 |
| 8 | 08IR27NPT | 27 | 0,6 | 0,6 |
| | 08IR18NPT | 18 | 0,6 | 0,6 |
| 11 | 11IR27NPT | 27 | 0,7 | 0,8 |
| | 11IR18NPT | 18 | 0,8 | 1,0 |
| | 11IR14NPT | 14 | 0,8 | 1,0 |
| 16 | 16IR27NPT | 27 | 0,7 | 0,8 |
| | 16IR18NPT | 18 | 0,8 | 1,0 |
| | 16IR14NPT | 14 | 0,9 | 1,2 |
| | 16IR11.5NPT | 11.5 | 1,1 | 1,5 |
| | 16IR8NPT | 8 | 1,3 | 1,8 |

| Left Hand Inserts |
|---|
| Description |
| - |
| 08IL27NPT |
| 08IL18NPT |
| 11IL27NPT |
| 11IL18NPT |
| 11IL14NPT |
| 16IL27NPT |
| 16IL18NPT |
| 16IL14NPT |
| 16IL11.5NPT |
| 16IL8NPT |

| Multi Tooth | | | | |
|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm |
| 22 | 22IR11,5NPT2M | 11.5 | 3,4 | 2,2 |
| 27 | 27IR11.5NPT3M | 11.5 | 3,5 | 5,6 |
| | 27IR8NPT2M | 8 | 2,9 | 4,7 |

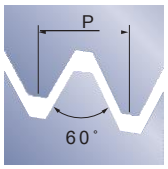


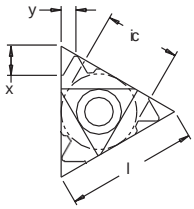

The left hand inserts table includes the same size, T.P.I and X, Y information as the right hand inserts table.

## *External* NPTF

Standard reference: ANSI B1. 20.3 - 1976

Tolerance class: Class 2

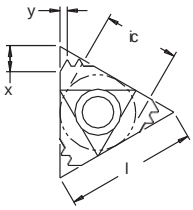



| Right Hand Inserts | | | | |
|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm |
| 11 | 11ER27NPTF | 27 | 0,7 | 0,8 |
| | 11ER18NPTF | 18 | 0,8 | 1,0 |
| | 11ER14NPTF | 14 | 0,8 | 1,0 |
| 16 | 16ER27NPTF | 27 | 0,7 | 0,8 |
| | 16ER18NPTF | 18 | 0,8 | 1,0 |
| | 16ER14NPTF | 14 | 0,9 | 1,2 |
| | 16ER11.5NPTF | 11.5 | 1,1 | 1,5 |
| | 16ER8NPTF | 8 | 1,3 | 1,8 |

| Left Hand Inserts |
|---|
| Description |
| 11EL27NPTF |
| 11EL18NPTF |
| 11EL14NPTF |
| 16EL27NPTF |
| 16EL18NPTF |
| 16EL14NPTF |
| 16EL11.5NPTF |
| 16EL8NPTF |

| Multi Tooth | | | | |
|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm |
| 22 | 22ER11,5NPTF2M | 11.5 | 3,4 | 2,2 |
| 27 | 27ER11.5NPTF3M | 11.5 | 3,5 | 5,6 |
| | 27ER8NPTF2M | 8 | 2,9 | 4,7 |

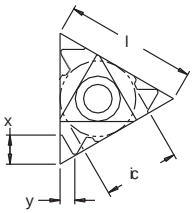



The left hand inserts table includes the same size, T.P.I and X, Y information as the right hand inserts table.

## *Internal* NPTF

Standard reference: USAS B2.1 :1968

Tolerance class: Standard NPT




### Right Hand Inserts

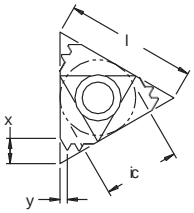
| Size | Description | T.P.I | X mm | Y mm |
|---|---|---|---|---|
| 6 | 06IR27NPTF | 27 | 0,7 | 0,6 |
| 8 | 08IR27NPTF | 27 | 0,6 | 0,6 |
| | 08IR18NPTF | 18 | 0,6 | 0,6 |
| 11 | 11IR27NPTF | 27 | 0,7 | 0,7 |
| | 11IR18NPTF | 18 | 0,8 | 1,0 |
| | 11IR14NPTF | 14 | 0,8 | 1,0 |
| 16 | 16IR27NPTF | 27 | 0,7 | 0,7 |
| | 16IR18NPTF | 18 | 0,8 | 1,0 |
| | 16IR14NPTF | 14 | 0,9 | 1,2 |
| | 16IR11.5NPTF | 11.5 | 1,1 | 1,5 |
| | 16IR8NPTF | 8 | 1,3 | 1,8 |

### Left Hand Inserts

| Description |
|---|
| - |
| 08IL27NPTF |
| 08IL18NPTF |
| 11IL27NPTF |
| 11IL18NPTF |
| 11IL14NPTF |
| 16IL27NPTF |
| 16IL18NPTF |
| 16IL14NPTF |
| 16IL11.5NPTF |
| 16IL8NPTF |

### Multi Tooth

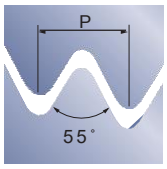
| Size | Description | T.P.I | X mm | Y mm |
|---|---|---|---|---|
| 22 | 22IR11,5NPT2M | 11.5 | 3,4 | 2,2 |
| 27 | 27IR11.5NPT3M | 11.5 | 3,5 | 5,6 |
| | 27IR8NPT2M | 8 | 2,9 | 4,7 |

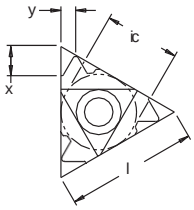



The left hand inserts table includes the same size, T.P.I and X, Y information as the right hand inserts table.

## *External* BSPT

Standard reference: B.S. 21:1985
Tolerance class: Standard BSPT



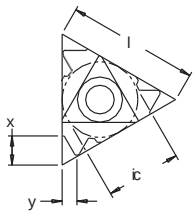




| Right Hand Inserts | | | | |
|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm |
| 16 | 16ER28BSPT | 28 | 0,7 | 0,8 |
| | 16ER19BSPT | 19 | 0,8 | 1,0 |
| | 16ER14BSPT | 14 | 0,9 | 1,2 |
| | 16ER11BSPT | 11 | 1,1 | 1,5 |

| Left Hand Inserts |
|---|
| Description |
| 16EL28BSPT |
| 16EL19BSPT |
| 16EL14BSPT |
| 16EL11BSPT |

## *Internal* BSPT

Standard reference: B.S. 21:1985
Tolerance class: Standard BSPT



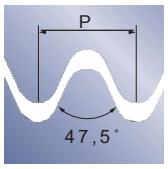

| Right Hand Inserts | | | | |
|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm |
| 6 | 06IR28BSPT | 28 | 0,6 | 0,6 |
| 8 | 08IR28BSPT | 28 | 0,6 | 0,6 |
| | 08IR19BSPT | 19 | 0,6 | 0,6 |
| 11 | 11IR28BSPT | 28 | 0,7 | 0,8 |
| | 11IR19BSPT | 19 | 0,8 | 1,0 |
| | 11IR14BSPT | 14 | 0,8 | 1,0 |
| 16 | 16IR28BSPT | 28 | 0,7 | 0,8 |
| | 16IR19BSPT | 19 | 0,8 | 1,0 |
| | 16IR14BSPT | 14 | 0,9 | 1,2 |
| | 16IR11BSPT | 11 | 1,1 | 1,5 |

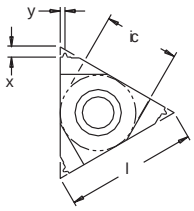
| Left Hand Inserts |
|---|
| Description |
| - |
| 08IL28BSPT |
| 08IL19BSPT |
| 11IL28BSPT |
| 11IL19BSPT |
| 11IL14BSPT |
| 16IL28BSPT |
| 16IL19BSPT |
| 16IL14BSPT |
| 16IL11BSPT |

The left hand inserts table includes the same size, T.P.I and X, Y information as the right hand inserts table.

# British Association

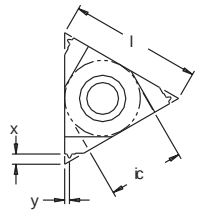
## *External* British Association
BA form




| Right Hand Inserts | | | | |
|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm |
| 11 | 11ER4BA | 38.48 | 0,8 | 0,5 |
| 16 | 16ER0BA | 25.40 | 0,8 | 0,7 |
| | 16ER2BA | 31.35 | 0,8 | 0,6 |
| | 16ER4BA | 38.48 | 0,8 | 0,5 |
| | 16ER6BA | 47.92 | 0,8 | 0,5 |
| | 16ER8BA | 59.07 | 0,8 | 0,4 |

## *Internal* British Association
BA form



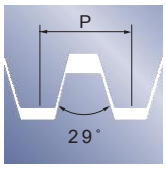

| Right Hand Inserts | | | | |
|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm |
| 11 | 11IR4BA | 38.48 | 0,8 | 0,5 |
| 16 | 16IR0BA | 25.40 | 0,8 | 0,7 |
| | 16IR2BA | 31.35 | 0,8 | 0,6 |
| | 16IR4BA | 38.48 | 0,8 | 0,5 |
| | 16IR6BA | 47.92 | 0,8 | 0,5 |
| | 16IR8BA | 59.07 | 0,8 | 0,4 |

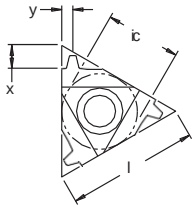
The left hand inserts table includes the same size, T.P.I and X, Y information as the right hand inserts table.

## *External* ACME Form

Standard reference: ANSI B1.5: 1988

Tolerance class: 3G

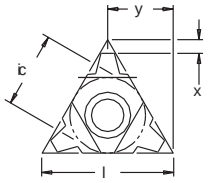



| Right Hand Inserts | | | | |
|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm |
| 11 | 11ER16ACME | 16 | 0,9 | 1,0 |
| 16 | 16ER16ACME | 16 | 0,9 | 1,0 |
| | 16ER14ACME | 14 | 1,0 | 1,2 |
| | 16ER12ACME | 12 | 1,1 | 1,2 |
| | 16ER10ACME | 10 | 1,3 | 1,3 |
| | 16ER8ACME | 8 | 1,5 | 1,5 |
| 22 | 22ER8ACME | 8 | 1,5 | 1,5 |
| | 22ER6ACME | 6 | 1,8 | 2,1 |
| | 22ER5ACME | 5 | 2,0 | 2,3 |
| 27 | 27ER4ACME | 4 | 2,3 | 2,7 |

| Left Hand Inserts |
|---|
| Description |
| 11EL16ACME |
| 16EL16ACME |
| 16EL14ACME |
| 16EL12ACME |
| 16EL10ACME |
| 16EL8ACME |
| 22EL8ACME |
| 22EL6ACME |
| 22EL5ACME |
| 27EL4ACME |

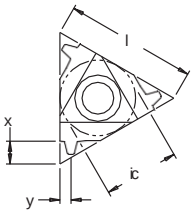
| U Style Inserts | | | | |
|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm |
| 22 | 22EILRU4ACME | 4 | 2,3 | 11,0 |
| 27 | 27EILRU3ACME | 3 | 2,8 | 13,7 |




## *Internal* ACME Form

Standard reference: ANSI B1.5: 1988

Tolerance class: 3G




| Right Hand Inserts | | | | |
|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm |
| 11 | 11IR16ACME | 16 | 0,9 | 1,0 |
| 16 | 16IR16ACME | 16 | 0,9 | 1,0 |
| | 16IR14ACME | 14 | 1,0 | 1,2 |
| | 16IR12ACME | 12 | 1,1 | 1,2 |
| | 16IR10ACME | 10 | 1,3 | 1,3 |
| | 16IR8ACME | 8 | 1,5 | 1,5 |
| 22 | 22IR8ACME | 8 | 1,5 | 1,5 |
| | 22IR6ACME | 6 | 1,8 | 2,1 |
| | 22IR5ACME | 5 | 2,0 | 2,3 |
| 27 | 27IR4ACME | 4 | 2,3 | 2,7 |

| Left Hand Inserts |
|---|
| Description |
| 11IL16ACME |
| 16IL16ACME |
| 16IL14ACME |
| 16IL12ACME |
| 16IL10ACME |
| 16IL8ACME |
| 22IL8ACME |
| 22IL6ACME |
| 22IL5ACME |
| 27IL4ACME |

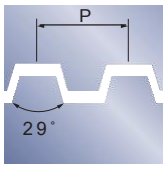
The left hand inserts table includes the same size, T.P.I and X, Y information as the right hand inserts table.

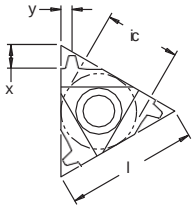
# STUB ACME External and Internal

## *External* STUB ACME

Standard reference: ANSI B1.8: 1988

Tolerance class: 2G

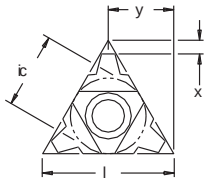



| Right Hand Inserts | | | | |
|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm |
| 11 | 11ER16STACME | 16 | 1,0 | 1,0 |
| 16 | 16ER16STACME | 16 | 1,0 | 1,0 |
| | 16ER14STACME | 14 | 1,1 | 1,1 |
| | 16ER12STACME | 12 | 1,2 | 1,2 |
| | 16ER10STACME | 10 | 1,3 | 1,3 |
| | 16ER8STACME | 8 | 1,5 | 1,5 |
| | 16ER6STACME | 6 | 1,8 | 1,8 |
| 22 | 22ER5STACME | 5 | 2,0 | 2,3 |
| | 22ER4STACME | 4 | 2,3 | 2,4 |
| 27 | 27ER4STACME | 4 | 2,3 | 2,4 |
| | 27ER3STACME | 3 | 2,8 | 2,9 |

| Left Hand Inserts |
|---|
| Description |
| 11EL16STACME |
| 16EL16STACME |
| 16EL14STACME |
| 16EL12STACME |
| 16EL10STACME |
| 16EL8STACME |
| 16EL6STACME |
| 22EL5STACME |
| 22EL4STACME |
| 27EL4STACME |
| 27EL3STACME |

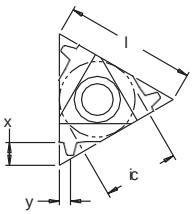
| U Style Inserts | | | | |
|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm |
| 22 | 22EILRU4STACME | 4 | 2,5 | 11,0 |
| 27 | 27EILRU3STACME | 3 | 3,3 | 13,7 |




## *Internal* STUB ACME

Standard reference: ANSI B1.8: 1988

Tolerance class: 2G



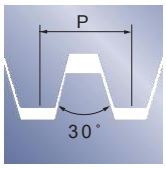

| Right Hand Inserts | | | | |
|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm |
| 11 | 11IR16STACME | 16 | 1,0 | 1,0 |
| 16 | 16IR16STACME | 16 | 1,0 | 1,0 |
| | 16IR14STACME | 14 | 1,1 | 1,1 |
| | 16IR12STACME | 12 | 1,2 | 1,2 |
| | 16IR10STACME | 10 | 1,3 | 1,3 |
| | 16IR8STACME | 8 | 1,5 | 1,5 |
| | 16IR6STACME | 6 | 1,8 | 1,8 |
| 22 | 22IR5STACME | 5 | 2,0 | 2,3 |
| | 22IR4STACME | 4 | 2,3 | 2,4 |
| 27 | 27IR4STACME | 4 | 2,3 | 2,4 |
| | 27IR3STACME | 3 | 2,8 | 2,9 |

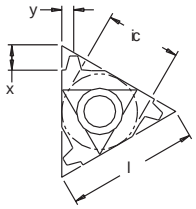
| Left Hand Inserts |
|---|
| Description |
| 11IL16STACME |
| 16IL16STACME |
| 16IL14STACME |
| 16IL12STACME |
| 16IL10STACME |
| 16IL8STACME |
| 16IL6STACME |
| 22IL5STACME |
| 22IL4STACME |
| 27IL4STACME |
| 27IL3STACME |

The left hand inserts table includes the same size, T.P.I and X, Y information as the right hand inserts table.

## *External* Trapezoidal

Standard reference: DIN 103
Tolerance class: 7e / 7H

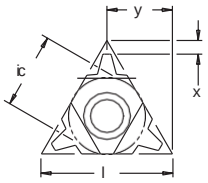



| Right Hand Inserts | | | | |
|---|---|---|---|---|
| Size | Description | Pitch mm | X mm | Y mm |
| 16 | 16ER1.5TR | 1,5 | 1,0 | 1,1 |
| | 16ER2.0TR | 2,0 | 1,0 | 1,3 |
| | 16ER3.0TR | 3,0 | 1,3 | 1,5 |
| 22 | 22ER4.0TR | 4,0 | 1,8 | 1,9 |
| | 22ER5.0TR | 5,0 | 2,0 | 2,4 |
| | 22ER6.0TR | 6,0 | 2,3 | 2,7 |
| 27 | 27ER6.0TR | 6,0 | 2,3 | 2,7 |

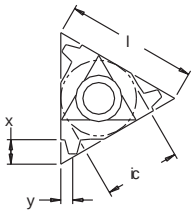
| Left Hand Inserts |
|---|
| Description |
| 16EL1.5TR |
| 16EL2.0TR |
| 16EL3.0TR |
| 22EL4.0TR |
| 22EL5.0TR |
| 22EL6.0TR |
| 27EL6.0TR |

| U Style Inserts | | | | |
|---|---|---|---|---|
| Size | Description | Pitch mm | X mm | Y mm |
| 22 | 22EILRU6.0TR | 6,0 | 2,0 | 11,0 |
| | 22EILRU8.0TR | 7,0 | 2,3 | 11,0 |
| 27 | 27EILRU8.0TR | 8,0 | 2,5 | 13,7 |
| | 27EILRU9.0TR | 9,0 | 3,0 | 13,7 |




## *Internal* Trapezoidal

Standard reference: DIN 103
Tolerance class: 7e / 7H




| Right Hand Inserts | | | | |
|---|---|---|---|---|
| Size | Description | Pitch mm | X mm | Y mm |
| 16 | 16IR1.5TR | 1,5 | 1,0 | 1,1 |
| | 16IR2.0TR | 2,0 | 1,0 | 1,3 |
| | 16IR3.0TR | 3,0 | 1,3 | 1,5 |
| 22 | 22IR4.0TR | 4,0 | 1,8 | 1,9 |
| | 22IR5.0TR | 5,0 | 2,0 | 2,4 |
| | 22IR6.0TR | 6,0 | 2,3 | 2,7 |
| 27 | 27IR6.0TR | 6,0 | 2,3 | 2,7 |

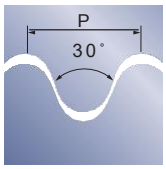
| Left Hand Inserts |
|---|
| Description |
| 16IL1.5TR |
| 16IL2.0TR |
| 16IL3.0TR |
| 22IL4.0TR |
| 22IL5.0TR |
| 2IL6.0TR |
| 27IL6.0TR |

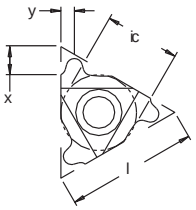
The left hand inserts table includes the same size, pitch and X, Y information as the right hand inserts table.

# Round Internal and External

## *External* Round

Standard reference: DIN 405
Tolerance class: 7h / 7H

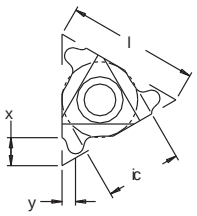



| Right Hand Inserts | | | | | Left Hand Inserts |
|---|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm | Description |
| 16 | 16ER6RD | 6 | 1,5 | 1,7 | 16EL6RD |
| | 16ER8RD | 8 | 1,4 | 1,3 | 16EL8RD |
| | 16ER10RD | 10 | 1,1 | 1,2 | 16EL10RD |
| 22 | 22ER6RD | 6 | 1,5 | 1,7 | 22EL6RD |
| | 22ER4RD | 4 | 2,2 | 2,3 | 22EL4RD |
| 27 | 27ER4RD | 4 | 2,2 | 2,3 | 27EL4RD |

## *Internal* Round

Standard reference: DIN 405
Tolerance class: 7h / 7H

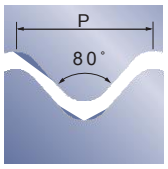


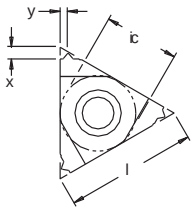

| Right Hand Inserts | | | | | Left Hand Inserts |
|---|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm | Description |
| 16 | 16IR6RD | 6 | 1,5 | 1,7 | 16IL6RD |
| | 16IR8RD | 8 | 1,4 | 1,3 | 16IL8RD |
| | 16IR10RD | 10 | 1,1 | 1,2 | 16IL10RD |
| 22 | 22IR6RD | 6 | 1,5 | 1,7 | 22IL6RD |
| | 22IR4RD | 4 | 2,2 | 2,3 | 22IL4RD |
| 27 | 27IR4RD | 4 | 2,2 | 2,3 | 27IL4RD |

The left hand inserts table includes the same size, T.P.I and X, Y information as the right hand inserts table.

## *External* PG

Standard reference: DIN 40430
Tolerance class: Standard

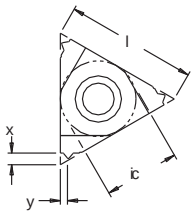



| Right Hand Inserts | | | | | | Left Hand Inserts |
|---|---|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm | Nominal Thread | Description |
| 16 | 16ER20PG | 20 | 0,7 | 0,8 | Pg 7 | 16EL20PG |
| | 16ER18PG | 18 | 0,8 | 0,9 | Pg 9/11/13.5/16 | 16EL18PG |
| | 16ER16PG | 16 | 0,8 | 1,0 | Pg 21/29/36/42/48 | 16EL16PG |

## *Internal* PG

Standard reference: DIN 40430
Tolerance class: Standard



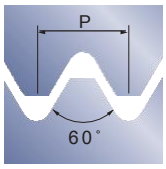

| Right Hand Inserts | | | | | | Left Hand Inserts |
|---|---|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm | Nominal Thread | Description |
| 8 | 08IR20PG | 20 | 0,6 | 0,7 | Pg 7 | 08IL20PG |
| 11 | 11IR20PG | 20 | 0,7 | 0,8 | Pg 7 | 11IL20PG |
| | 11IR18PG | 18 | 0,8 | 0,9 | Pg 9/11/13.5/16 | 11IL18PG |
| | 11IR16PG | 16 | 0,8 | 1,0 | Pg 21/29/36/42/48 | 11IL16PG |
| 16 | 16IR20PG | 20 | 0,7 | 0,8 | Pg 7 | 16IL20PG |
| | 16IR18PG | 18 | 0,8 | 0,9 | Pg 9/11/13.5/16 | 16IL18PG |
| | 16IR16PG | 16 | 0,8 | 1,0 | Pg 21/29/36/42/48 | 16IL16PG |

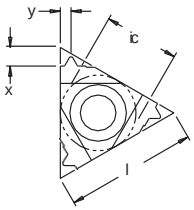
The left hand inserts table includes the same size, T.P.I and X, Y information as the right hand inserts table.

## *External* UNJ

Standard reference: MIL - S 8879C

Tolerance class: 3A / 3B




| Right Hand Inserts | | | | | Left Hand Inserts |
|---|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm | Description |
| 11 | 11ER48UNJ | 48 | 0,6 | 0,6 | 11EL48UNJ |
| | 11ER44UNJ | 44 | 0,6 | 0,6 | 11EL44UNJ |
| | 11ER40UNJ | 40 | 0,6 | 0,6 | 11EL40UNJ |
| | 11ER36UNJ | 36 | 0,6 | 0,6 | 11EL36UNJ |
| | 11ER32UNJ | 32 | 0,6 | 0,6 | 11EL32UNJ |
| | 11ER28UNJ | 28 | 0,6 | 0,6 | 11EL28UNJ |
| | 11ER24UNJ | 24 | 0,7 | 0,8 | 11EL24UNJ |
| | 11ER20UNJ | 20 | 0,8 | 0,9 | 11EL20UNJ |
| | 11ER18UNJ | 18 | 0,8 | 1,0 | 11EL18UNJ |
| | 11ER16UNJ | 16 | 0,8 | 1,0 | 11EL16UNJ |
| | 11ER14UNJ | 14 | 0,9 | 1,0 | 11EL14UNJ |
| 16 | 16ER48UNJ | 48 | 0,6 | 0,6 | 16EL48UNJ |
| | 16ER44UNJ | 44 | 0,6 | 0,6 | 16EL44UNJ |
| | 16ER40UNJ | 40 | 0,6 | 0,6 | 16EL40UNJ |
| | 16ER36UNJ | 36 | 0,6 | 0,6 | 16EL36UNJ |
| | 16ER32UNJ | 32 | 0,6 | 0,6 | 16EL32UNJ |
| | 16ER28UNJ | 28 | 0,6 | 0,6 | 16EL28UNJ |
| | 16ER24UNJ | 24 | 0,7 | 0,8 | 16EL24UNJ |
| | 16ER20UNJ | 20 | 0,8 | 0,9 | 16EL20UNJ |
| | 16ER18UNJ | 18 | 0,8 | 1,0 | 16EL18UNJ |
| | 16ER16UNJ | 16 | 0,8 | 1,0 | 16EL16UNJ |
| | 16ER14UNJ | 14 | 1,0 | 1,2 | 16EL14UNJ |
| | 16ER13UNJ | 13 | 1,0 | 1,3 | 16EL13UNJ |
| | 16ER12UNJ | 12 | 1,1 | 1,4 | 16EL12UNJ |
| | 16ER11UNJ | 11 | 1,1 | 1,5 | 16EL11UNJ |
| | 16ER10UNJ | 10 | 1,1 | 1,5 | 16EL10UNJ |
| | 16ER9UNJ | 9 | 1,2 | 1,6 | 16EL9UNJ |
| | 16ER8UNJ | 8 | 1,2 | 1,6 | 16EL8UNJ |

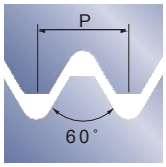
To machine internal UNJ, use standard UN insert and produce bore to give correct thread truncation.

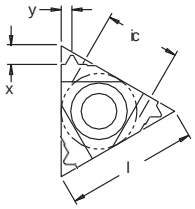
The left hand inserts table includes the same size, T.P.I and X, Y information as the right hand inserts table.

## *External* MJ

Standard reference: ISO 5855

Tolerance class: 4h / 6h - 4H / 5H




| Right Hand Inserts | | | | |
|---|---|---|---|---|
| Size | Description | Pitch mm | X mm | Y mm |
| 16 | 16ER1.0MJ | 1,0 | 0,6 | 0,7 |
| | 16ER1.25MJ | 1,25 | 0,7 | 0,9 |
| | 16ER1.5MJ | 1,5 | 0,8 | 1,0 |
| | 16ER2.0MJ | 2,0 | 1,0 | 1,3 |
| | 16ER2.5MJ | 2,5 | 1,1 | 1,5 |
| | 16ER3.0MJ | 3,0 | 1,2 | 1,6 |

| Left Hand Inserts |
|---|
| Description |
| 16EL1.0MJ |
| 16EL1.25MJ |
| 16EL1.5MJ |
| 16EL2.0MJ |
| 16EL2.5MJ |
| 16EL3.0MJ |

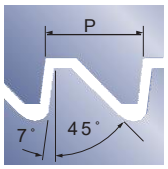
To machine MJ, use standard ISO insert and produce bore to give correct thread truncation.

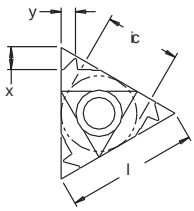
The left hand inserts table includes the same size, pitch and X, Y information as the right hand inserts table.

# British Buttress

## *External* British Buttress

Tolerance class: Medium Class

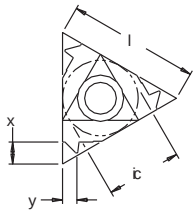



| Right Hand Inserts | | | | | Left Hand Inserts |
|---|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm | Description |
| 16 | 16ER20BBUTT | 20 | 1,0 | 1,4 | 16EL20BBUTT |
| | 16ER16BBUTT | 16 | 1,3 | 1,9 | 16EL16BBUTT |
| | 16ER12BBUTT | 12 | 1,4 | 2,0 | 16EL12BBUTT |
| | 16ER10BBUTT | 10 | 1,5 | 2,3 | 16EL10BBUTT |
| 22 | 22ER8BBUTT | 8 | 2,0 | 3,2 | 22EL8BBUTT |
| | 22ER6BBUTT | 6 | 2,2 | 3,5 | 22EL6BBUTT |
| 27 | 27ER4BBUTT | 4 | 2,2 | 3,5 | 27EL4BBUTT |

## *Internal* British Buttress

Tolerance class: Medium Class

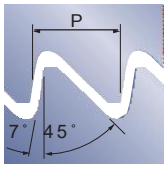


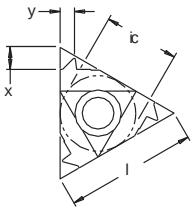

| Right Hand Inserts | | | | | Left Hand Inserts |
|---|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm | Description |
| 16 | 16IR20BBUTT | 20 | 1,0 | 1,4 | 16IL20BBUTT |
| | 16IR16BBUTT | 16 | 1,3 | 1,9 | 16IL16BBUTT |
| | 16IR12BBUTT | 12 | 1,4 | 2,0 | 16IL12BBUTT |
| | 16IR10BBUTT | 10 | 1,5 | 2,3 | 16IL10BBUTT |
| 22 | 22IR8BBUTT | 8 | 2,0 | 3,2 | 22IL8BBUTT |
| | 22IR6BBUTT | 6 | 2,2 | 3,5 | 22IL6BBUTT |
| 27 | 27IR4BBUTT | 4 | 2,2 | 3,5 | 27IL4BBUTT |

The left hand inserts table includes the same size, pitch and X, Y information as the right hand inserts table.

## *External* American Buttress

Standard reference: ANSI B1.9.1973
Tolerance class: Class 2



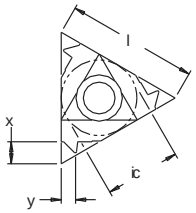

| Right Hand Inserts | | | | |
|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm |
| 11 | 11ER20ABUTT | 20 | 1,0 | 1,3 |
| | 11ER16ABUTT | 16 | 1,0 | 1,5 |
| 16 | 16ER20ABUTT | 20 | 1,0 | 1,3 |
| | 16ER16ABUTT | 16 | 1,0 | 1,5 |
| | 16ER12ABUTT | 12 | 1,4 | 2,0 |
| | 16ER10ABUTT | 10 | 1,5 | 2,3 |
| 22 | 22ER8ABUTT | 8 | 2,1 | 3,3 |
| | 22ER6ABUTT | 6 | 2,1 | 3,4 |

| Left Hand Inserts |
|---|
| Description |
| 11EL20ABUTT |
| 11EL16ABUTT |
| 16EL20ABUTT |
| 16EL16ABUTT |
| 16EL12ABUTT |
| 16EL10ABUTT |
| 22EL8ABUTT |
| 22EL6ABUTT |

| U Style Inserts | | | | |
|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm |
| 27 | 27ERU3ABUTT | 3 | 3,1 | 11,7 |

## *Internal* American Buttress

Standard reference: ANSI B1.9.1973
Tolerance class: Class 2




| Right Hand Inserts | | | | |
|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm |
| 11 | 11IR20ABUTT | 20 | 1,0 | 1,3 |
| | 11IR16ABUTT | 16 | 1,0 | 1,5 |
| 16 | 16IR20ABUTT | 20 | 1,0 | 1,3 |
| | 16IR16ABUTT | 16 | 1,0 | 1,5 |
| | 16IR12ABUTT | 12 | 1,4 | 2,0 |
| | 16IR10ABUTT | 10 | 1,5 | 2,3 |
| 22 | 22IR8ABUTT | 8 | 2,1 | 3,3 |
| | 22IR6ABUTT | 6 | 2,1 | 3,4 |

| Left Hand Inserts |
|---|
| Description |
| 11IL20ABUTT |
| 11IL16ABUTT |
| 16IL20ABUTT |
| 16IL16ABUTT |
| 16IL12ABUTT |
| 16IL10ABUTT |
| 22IL8ABUTT |
| 22IL6ABUTT |

| U Style Inserts | | | | |
|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm |
| 27 | 27IRU3ABUTT | 3 | 3,1 | 11,7 |

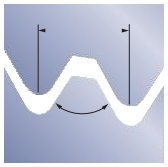
The left hand inserts table includes the same size, T.P.I and X, Y information as the right hand inserts table.

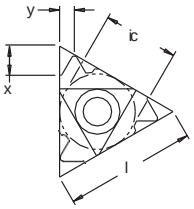
# API (Oilfield)

## *External* API

Standard reference: API specification 7:1990

Tolerance class: Standard API



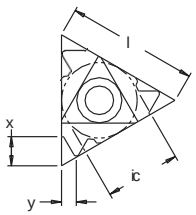



| Right Hand Inserts | | | | | | | Left Hand Inserts |
|---|---|---|---|---|---|---|---|
| Size | Description | T.P.I | Taper I.P.F | Taper angle | X mm | Y mm | Description |
| 22 | 22ER4API382 | 4 | 2 | 4º - 43' | 2,1 | 2,8 | 22EL4API382 |
| | 22ER4API383 | 4 | 3 | 7º - 1' | 2,1 | 2,8 | 22EL4API383 |
| | 22ER4API502 | 4 | 3 | 7º - 1' | 2,0 | 3,0 | 22EL4API502 |
| | 22ER4API503 | 4 | 3 | 7º - 1' | 2,0 | 3,0 | 22EL4API503 |
| | 22ER5API403 | 5 | 3 | 7º - 1' | 1,8 | 2,5 | 22EL5API403 |
| | 22ER6API551.5 | 6 | 1.5 | 3º - 33' | 1,8 | 2,6 | 22EL6API551.5 |
| 27 | 27ER4API380.5 | 4 | 0.5 | 1º - 1' | 2,1 | 2,8 | 27EL4API380.5 |
| | 27ER4API382 | 4 | 2 | 4º - 43' | 2,1 | 2,8 | 27EL4API382 |
| | 27ER4API383 | 4 | 3 | 7º - 1' | 2,1 | 2,8 | 27EL4API383 |
| | 27ER4API502 | 4 | 2 | 4º - 43' | 2,0 | 3,0 | 27EL4API502 |
| | 27ER4API503 | 4 | 3 | 7º - 1' | 2,0 | 2,0 | 27EL4API503 |
| | 27ER4API652 | 4 | 2 | 4º - 43' | 2,1 | 3,1 | 27EL4API652 |

## *Internal* API

Standard reference: API specification 7:1990

Tolerance class: Standard API



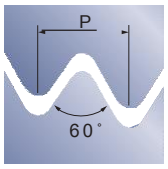

| Right Hand Inserts | | | | | | | Left Hand Inserts |
|---|---|---|---|---|---|---|---|
| Size | Description | T.P.I | Taper I.P.F | Taper angle | X mm | Y mm | Description |
| 22 | 22IR4API382 | 4 | 2 | 4º - 43' | 2,1 | 2,8 | 22IL4API382 |
| | 22IR4API383 | 4 | 3 | 7º - 1' | 2,1 | 2,8 | 22IL4API383 |
| | 22IR4API502 | 4 | 2 | 4º - 43' | 2,0 | 3,0 | 22IL4API502 |
| | 22IR4API503 | 4 | 3 | 7º - 1' | 2,0 | 3,0 | 22IL4API503 |
| | 22IR5API403 | 5 | 3 | 7º - 1' | 1,8 | 2,5 | 22IL5API403 |
| | 22IR6API551.5 | 6 | 1.5 | 3º - 33' | 1,8 | 2,6 | 22IL6API551.5 |
| 27 | 27IR4API380.5 | 4 | 0.5 | 1º - 11' | 2,1 | 2,8 | 27IL4API380.5 |
| | 27IR4API382 | 4 | 2 | 4º - 43' | 2,1 | 2,8 | 27IL4API382 |
| | 27IR4API383 | 4 | 3 | 7º - 1' | 2,1 | 2,8 | 27IL4API383 |
| | 27IR4API502 | 4 | 2 | 4º - 43' | 2,0 | 3,0 | 27IL4API502 |
| | 27IR4API503 | 4 | 3 | 7º - 1' | 2,0 | 2,0 | 27IL4API503 |
| | 27IR4API652 | 4 | 2 | 4º - 43' | 2,1 | 3,1 | 27IL4API652 |

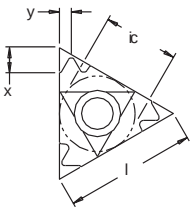
The left hand inserts table includes the same size, T.P.I and X, Y information as the right hand inserts table.

## *External* API Round

Standard reference: API Standard 5B: 1979

Tolerance class: Standard API round



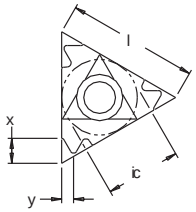

| Right Hand Inserts | | | | |
|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm |
| 16 | 16ER10APIRD | 10 | 1,2 | 1,4 |
| | 16ER8APIRD | 8 | 1,3 | 1,5 |
| 22 | 22ER8APIRD | 8 | 1,3 | 1,5 |

| Left Hand Inserts |
|---|
| Description |
| 16EL10APIRD |
| 16EL8APIRD |
| 22EL8APIRD |

## *Internal* API Round

Standard reference: API Standard 5B:1979

Tolerance class: Standard API round




| Right Hand Inserts | | | | |
|---|---|---|---|---|
| Size | Description | T.P.I | X mm | Y mm |
| 16 | 16IR10APIRD | 10 | 1,2 | 1,4 |
| | 16IR8APIRD | 8 | 1,3 | 1,5 |
| 22 | 22IR8APIRD | 8 | 1,3 | 1,5 |

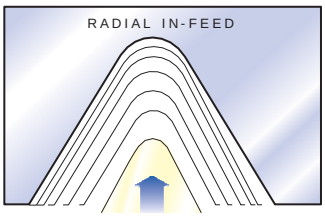
| Left Hand Inserts |
|---|
| Description |
| 16IL10APIRD |
| 16IL8APIRD |
| 22IL8APIRD |

The left hand inserts table includes the same size, T.P.I range, I.P.F and X, Y information as the right hand inserts table.

# Oilfield Connectors

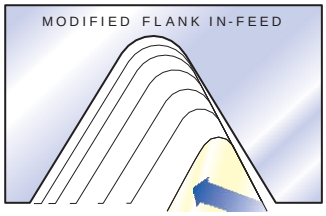
| Oilfield Connectors | | | |
|---|---|---|---|
| Reference to Part Number | T.P.I | Taper I.P.F | CONNECTOR No. or Size |
| API V 0.038R | 4 | 2 | NC23, NC28, NC31, NC35, NC38, NC40, NC44, NC46 NC50, 4FH, 2-3 /8IF, 3-1/2IF,4IF, 4-1/2IF, 5-1/2IF |
| API V 0.038R | 4 | 3 | NC56, NC61, NC70, NC77 |
| API V 0.040 | 5 | 3 | 2-3/8REG, 2-7/8 REG, 3-1/2REG, 4-1/2 REG, 3-1/2FH, 4-1/2 FH |
| API V 0.050 | 4 | 3 | 5-1/2 REG, 7-5/8 REG, 8-5/8 REG |
| API V 0.050 | 4 | 2 | 6-5/8 REG, 5-1/2 FH, 6-5/8 FH |
| API V 0.055 | 6 | 1.5 | NC10, NC12, NC13, NC16 |
| API V 0.065 | 4 | 2 | Superceded by API V 0.038R |

# In-Feed & Recommendations



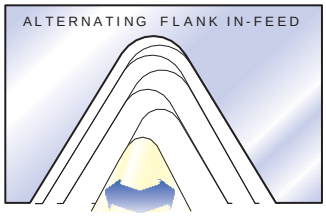

**Radial In-Feed**

- Most commonly used method on manual lathes.
- Equal wear on leading and trailing edge.
- Good surface finish on trailing edge.
- Use on work hardening materials.
- Use on short chipping materials.
- For pitches of less than 1,5mm or 16 T.P.I.




**Modified Flank In-Feed**

- For threads greater than 1,5mm or 16 T.P.I.
- Reduced cutting pressure on larger pitches.
- Reduced chatter.
- Directs chip away from the cutting edge.
- Displaced in-feed angle improves surface finish.
- First choice for internal threading.

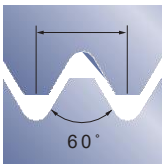



**Alternating Flank In-Feed**

- Recommended for large pitches, square ACME and trapezoidal forms.
- Recommended for long chipping materials.
- Method divides the work between both flanks.
- Results in equal wear.
- Less cutting pressure.
- Not available on all lathes.

## Threading

The table below provides recommendations for depths of cut for the different passes. These recommendations are intended as starting values for machining in steel and include stock 0,020 - 0,075mm above crest. The suitable number of passes must be determined by trial and error.




## I.S.O Metric (ISO) 60°, External

| No. of Passes | Pitch (mm) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0,5 | 0,75 | 0,8 | 1,0 | 1,25 | 1,5 | 1,75 | 2,0 | 2,5 | 3,0 | 3,5 | 4,0 | 4,5 | 5,0 | 5,5 | 6,0 |
| | Radial infeed per pass (mm) | | | | | | | | | | | | | | | |
| 1 | 0,102 | 0,178 | 0,178 | 0,178 | 0,178 | 0,229 | 0,229 | 0,254 | 0,279 | 0,279 | 0,330 | 0,330 | 0,381 | 0,406 | 0,432 | 0,457 |
| 2 | 0,102 | 0,152 | 0,152 | 0,178 | 0,178 | 0,203 | 0,203 | 0,229 | 0,254 | 0,254 | 0,305 | 0,330 | 0,330 | 0,381 | 0,406 | 0,432 |
| 3 | 0,076 | 0,102 | 0,127 | 0,127 | 0,152 | 0,178 | 0,152 | 0,178 | 0,203 | 0,203 | 0,254 | 0,254 | 0,279 | 0,330 | 0,330 | 0,356 |
| 4 | 0,076 | 0,076 | 0,076 | 0,102 | 0,127 | 0,152 | 0,152 | 0,152 | 0,178 | 0,178 | 0,203 | 0,229 | 0,229 | 0,279 | 0,279 | 0,305 |
| 5 | **0,356** | **0,508** | **0,533** | 0,076 | 0,102 | 0,127 | 0,127 | 0,152 | 0,152 | 0,152 | 0,178 | 0,178 | 0,229 | 0,229 | 0,229 | 0,279 |
| 6 | | | | **0,660** | 0,076 | 0,076 | 0,102 | 0,127 | 0,127 | 0,152 | 0,178 | 0,178 | 0,203 | 0,229 | 0,229 | 0,229 |
| 7 | | | | | **0,813** | **0,965** | 0,102 | 0,102 | 0,127 | 0,127 | 0,152 | 0,152 | 0,178 | 0,203 | 0,203 | 0,229 |
| 8 | | | | | | | 0,076 | 0,076 | 0,102 | 0,127 | 0,152 | 0,152 | 0,178 | 0,178 | 0,178 | 0,203 |
| 9 | | | | | | | **1,143** | **1,270** | 0,102 | 0,127 | 0,152 | 0,152 | 0,152 | 0,178 | 0,178 | 0,203 |
| 10 | | | | | | | | | 0,076 | 0,102 | 0,127 | 0,127 | 0,152 | 0,178 | 0,178 | 0,178 |
| 11 | | | | | | | | | **1,600** | 0,102 | 0,102 | 0,127 | 0,152 | 0,152 | 0,152 | 0,178 |
| 12 | | | | | | | | | | 0,076 | 0,076 | 0,127 | 0,127 | 0,152 | 0,152 | 0,152 |
| 13 | | | | | | | | | | **1,880** | **2,210** | 0,102 | 0,127 | 0,127 | 0,127 | 0,152 |
| 14 | | | | | | | | | | | | 0,076 | 0,102 | 0,102 | 0,127 | 0,152 |
| 15 | | | | | | | | | | | | **2,515** | **2,819** | **3,124** | 0,127 | 0,127 |
| 16 | | | | | | | | | | | | | | | 0,102 | 0,102 |
| | | | | | | | | | | | | | | | **3,429** | **3,734** |

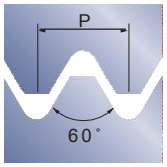
Last pass equals total depth of thread.

## I.S.O Metric (ISO) 60°, Internal

| No. of Passes | Pitch (mm) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0,5 | 0,75 | 1,0 | 1,25 | 1,5 | 1,75 | 2,0 | 2,5 | 3,0 | 3,5 | 4,0 | 4,5 | 5,0 | 5,5 | 6,0 |
| | Radial infeed per pass (mm) | | | | | | | | | | | | | | |
| 1 | 0,102 | 0,178 | 0,178 | 0,203 | 0,254 | 0,229 | 0,254 | 0,279 | 0,279 | 0,305 | 0,330 | 0,356 | 0,381 | 0,381 | 0,406 |
| 2 | 0,102 | 0,127 | 0,152 | 0,178 | 0,203 | 0,203 | 0,229 | 0,229 | 0,229 | 0,279 | 0,305 | 0,330 | 0,356 | 0,356 | 0,406 |
| 3 | 0,076 | 0,102 | 0,102 | 0,127 | 0,152 | 0,152 | 0,178 | 0,178 | 0,203 | 0,229 | 0,229 | 0,279 | 0,305 | 0,305 | 0,356 |
| 4 | 0,076 | 0,076 | 0,102 | 0,102 | 0,102 | 0,127 | 0,152 | 0,152 | 0,152 | 0,203 | 0,203 | 0,229 | 0,254 | 0,254 | 0,279 |
| 5 | **0,356** | **0,483** | 0,076 | 0,102 | 0,102 | 0,102 | 0,127 | 0,152 | 0,152 | 0,178 | 0,178 | 0,203 | 0,229 | 0,229 | 0,229 |
| 6 | | | **0,610** | 0,076 | 0,076 | 0,102 | 0,102 | 0,127 | 0,152 | 0,152 | 0,152 | 0,178 | 0,203 | 0,203 | 0,229 |
| 7 | | | | **0,787** | **0,889** | 0,102 | 0,102 | 0,102 | 0,127 | 0,152 | 0,152 | 0,152 | 0,178 | 0,178 | 0,203 |
| 8 | | | | | | 0,076 | 0,076 | 0,102 | 0,102 | 0,152 | 0,152 | 0,152 | 0,152 | 0,178 | 0,178 |
| 9 | | | | | | **1,092** | **1,219** | 0,102 | 0,102 | 0,127 | 0,127 | 0,152 | 0,152 | 0,152 | 0,178 |
| 10 | | | | | | | | 0,076 | 0,102 | 0,102 | 0,127 | 0,152 | 0,152 | 0,152 | 0,152 |
| 11 | | | | | | | | **1,499** | 0,102 | 0,102 | 0,102 | 0,127 | 0,152 | 0,152 | 0,152 |
| 12 | | | | | | | | | 0,076 | 0,076 | 0,102 | 0,127 | 0,152 | 0,152 | 0,152 |
| 13 | | | | | | | | | **1,778** | **2,057** | 0,102 | 0,102 | 0,127 | 0,152 | 0,152 |
| 14 | | | | | | | | | | | 0,076 | 0,102 | 0,102 | 0,127 | 0,152 |
| 15 | | | | | | | | | | | **2,337** | **2,642** | **2,896** | 0,127 | 0,127 |
| 16 | | | | | | | | | | | | | | 0,102 | 0,102 |
| | | | | | | | | | | | | | | **3,200** | **3,454** |

Last pass equals total depth of thread.

# In-Feed Recommendations




## UNIFIED (UN) 60°, External

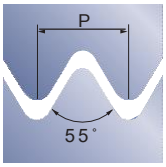
| No. of Passes | T.P.I | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 32 | 28 | 24 | 20 | 18 | 16 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4.5 | 4 |
| | Radial infeed per pass (mm) | | | | | | | | | | | | | | | | | |
| 1 | 0,178 | 0,178 | 0,178 | 0,203 | 0,229 | 0,229 | 0,229 | 0,254 | 0,279 | 0,279 | 0,279 | 0,279 | 0,305 | 0,356 | 0,356 | 0,432 | 0,406 | 0,483 |
| 2 | 0,152 | 0,152 | 0,178 | 0,178 | 0,203 | 0,203 | 0,229 | 0,229 | 0,229 | 0,254 | 0,229 | 0,229 | 0,254 | 0,330 | 0,330 | 0,406 | 0,381 | 0,432 |
| 3 | 0,127 | 0,127 | 0,152 | 0,152 | 0,152 | 0,152 | 0,178 | 0,178 | 0,203 | 0,203 | 0,203 | 0,203 | 0,229 | 0,254 | 0,254 | 0,330 | 0,330 | 0,356 |
| 4 | 0,076 | 0,102 | 0,127 | 0,127 | 0,152 | 0,152 | 0,152 | 0,152 | 0,152 | 0,178 | 0,178 | 0,178 | 0,178 | 0,229 | 0,229 | 0,279 | 0,279 | 0,330 |
| 5 | **0,533** | 0,076 | 0,076 | 0,102 | 0,127 | 0,127 | 0,127 | 0,152 | 0,152 | 0,152 | 0,152 | 0,152 | 0,178 | 0,178 | 0,203 | 0,229 | 0,254 | 0,305 |
| 6 | | **0,635** | **0,711** | 0,076 | 0,076 | 0,102 | 0,102 | 0,127 | 0,152 | 0,152 | 0,152 | 0,152 | 0,152 | 0,178 | 0,178 | 0,229 | 0,229 | 0,254 |
| 7 | | | | **0,838** | **0,940** | 0,076 | 0,102 | 0,102 | 0,127 | 0,127 | 0,152 | 0,152 | 0,152 | 0,152 | 0,178 | 0,203 | 0,203 | 0,229 |
| 8 | | | | | | **1,041** | 0,076 | 0,076 | 0,076 | 0,102 | 0,127 | 0,127 | 0,152 | 0,152 | 0,152 | 0,178 | 0,203 | 0,229 |
| 9 | | | | | | | **1,194** | **1,270** | **1,372** | 0,076 | 0,102 | 0,127 | 0,127 | 0,152 | 0,152 | 0,178 | 0,178 | 0,229 |
| 10 | | | | | | | | | | **1,499** | 0,076 | 0,102 | 0,127 | 0,127 | 0,152 | 0,178 | 0,178 | 0,203 |
| 11 | | | | | | | | | | | **1,651** | 0,076 | 0,102 | 0,102 | 0,152 | 0,178 | 0,152 | 0,178 |
| 12 | | | | | | | | | | | | **1,778** | 0,076 | 0,076 | 0,127 | 0,152 | 0,152 | 0,178 |
| 13 | | | | | | | | | | | | | **2,032** | **2,286** | 0,102 | 0,127 | 0,152 | 0,152 |
| 14 | | | | | | | | | | | | | | | 0,102 | 0,102 | 0,152 | 0,152 |
| 15 | | | | | | | | | | | | | | | **2,667** | **3,200** | 0,152 | 0,127 |
| 16 | | | | | | | | | | | | | | | | | 0,127 | 0,102 |
| | | | | | | | | | | | | | | | | | **3,531** | **3,937** |

Last pass equals total depth of thread.

## UNIFIED (UN) 60°, Internal

| No. of Passes | T.P.I | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 32 | 28 | 24 | 20 | 18 | 16 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4.5 | 4 |
| | Radial infeed per pass (mm) | | | | | | | | | | | | | | | | | |
| 1 | 0,178 | 0,178 | 0,178 | 0,203 | 0,229 | 0,229 | 0,229 | 0,254 | 0,279 | 0,279 | 0,279 | 0,279 | 0,305 | 0,330 | 0,356 | 0,406 | 0,406 | 0,457 |
| 2 | 0,152 | 0,152 | 0,152 | 0,178 | 0,178 | 0,178 | 0,203 | 0,229 | 0,229 | 0,229 | 0,229 | 0,229 | 0,279 | 0,305 | 0,330 | 0,356 | 0,406 | 0,432 |
| 3 | 0,102 | 0,102 | 0,152 | 0,127 | 0,152 | 0,152 | 0,152 | 0,152 | 0,178 | 0,178 | 0,152 | 0,178 | 0,203 | 0,229 | 0,229 | 0,305 | 0,330 | 0,356 |
| 4 | 0,076 | 0,102 | 0,102 | 0,102 | 0,127 | 0,127 | 0,152 | 0,152 | 0,152 | 0,152 | 0,152 | 0,152 | 0,178 | 0,203 | 0,203 | 0,254 | 0,254 | 0,305 |
| 5 | **0,508** | 0,076 | 0,076 | 0,102 | 0,102 | 0,102 | 0,102 | 0,127 | 0,127 | 0,152 | 0,152 | 0,152 | 0,152 | 0,178 | 0,178 | 0,229 | 0,229 | 0,254 |
| 6 | | **0,610** | **0,660** | 0,076 | 0,076 | 0,102 | 0,102 | 0,102 | 0,102 | 0,127 | 0,127 | 0,152 | 0,152 | 0,152 | 0,152 | 0,203 | 0,203 | 0,229 |
| 7 | | | | **0,787** | **0,864** | 0,076 | 0,102 | 0,102 | 0,102 | 0,102 | 0,102 | 0,127 | 0,127 | 0,152 | 0,152 | 0,178 | 0,178 | 0,229 |
| 8 | | | | | | **0,940** | 0,076 | 0,076 | 0,076 | 0,102 | 0,102 | 0,102 | 0,102 | 0,152 | 0,152 | 0,178 | 0,178 | 0,178 |
| 9 | | | | | | | **1,118** | **1,194** | **1,245** | 0,076 | 0,102 | 0,102 | 0,102 | 0,127 | 0,152 | 0,152 | 0,178 | 0,178 |
| 10 | | | | | | | | | | **1,397** | 0,076 | 0,102 | 0,102 | 0,127 | 0,127 | 0,152 | 0,152 | 0,178 |
| 11 | | | | | | | | | | | **1,499** | 0,076 | 0,102 | 0,102 | 0,127 | 0,152 | 0,152 | 0,178 |
| 12 | | | | | | | | | | | | **1,651** | 0,076 | 0,076 | 0,102 | 0,152 | 0,152 | 0,152 |
| 13 | | | | | | | | | | | | | **1,880** | **2,134** | 0,102 | 0,127 | 0,152 | 0,152 |
| 14 | | | | | | | | | | | | | | | 0,102 | 0,102 | 0,127 | 0,152 |
| 15 | | | | | | | | | | | | | | | **2,464** | **2,946** | 0,127 | 0,127 |
| 16 | | | | | | | | | | | | | | | | | 0,102 | 0,102 |
| 17 | | | | | | | | | | | | | | | | | **3,277** | **3,658** |

Last pass equals total depth of thread.

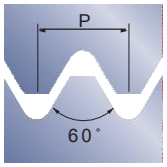



## Whitworth

| No. of Passes | T.P.I | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 28 | 26 | 20 | 19 | 18 | 16 | 14 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4.5 | 4 |
| | Radial infeed per pass (mm) | | | | | | | | | | | | | | | | |
| 1 | 0,203 | 0,203 | 0,203 | 0,229 | 0,229 | 0,203 | 0,254 | 0,279 | 0,279 | 0,305 | 0,279 | 0,305 | 0,356 | 0,356 | 0,381 | 0,406 | 0,457 |
| 2 | 0,178 | 0,152 | 0,203 | 0,203 | 0,203 | 0,203 | 0,229 | 0,254 | 0,254 | 0,254 | 0,229 | 0,279 | 0,305 | 0,305 | 0,381 | 0,406 | 0,432 |
| 3 | 0,127 | 0,152 | 0,152 | 0,152 | 0,178 | 0,152 | 0,178 | 0,203 | 0,203 | 0,203 | 0,229 | 0,229 | 0,279 | 0,279 | 0,356 | 0,356 | 0,356 |
| 4 | 0,102 | 0,102 | 0,127 | 0,127 | 0,152 | 0,152 | 0,152 | 0,178 | 0,178 | 0,178 | 0,203 | 0,203 | 0,229 | 0,254 | 0,305 | 0,305 | 0,330 |
| 5 | 0,076 | 0,076 | 0,102 | 0,127 | 0,127 | 0,127 | 0,127 | 0,152 | 0,152 | 0,152 | 0,178 | 0,178 | 0,203 | 0,203 | 0,279 | 0,279 | 0,330 |
| 6 | **0,635** | **0,686** | 0,076 | 0,076 | 0,102 | 0,127 | 0,127 | 0,152 | 0,152 | 0,127 | 0,152 | 0,152 | 0,203 | 0,203 | 0,254 | 0,254 | 0,279 |
| 7 | | | **0,864** | **0,914** | 0,076 | 0,102 | 0,102 | 0,127 | 0,127 | 0,127 | 0,152 | 0,152 | 0,178 | 0,203 | 0,229 | 0,229 | 0,279 |
| 8 | | | | | **1,067** | 0,076 | 0,076 | 0,076 | 0,127 | 0,127 | 0,127 | 0,152 | 0,152 | 0,178 | 0,203 | 0,229 | 0,254 |
| 9 | | | | | | **1,143** | **1,245** | **1,422** | 0,076 | 0,127 | 0,127 | 0,127 | 0,152 | 0,152 | 0,203 | 0,203 | 0,254 |
| 10 | | | | | | | | | **1,549** | 0,076 | 0,127 | 0,127 | 0,152 | 0,152 | 0,203 | 0,178 | 0,229 |
| 11 | | | | | | | | | | **1,676** | 0,076 | 0,127 | 0,127 | 0,152 | 0,178 | 0,178 | 0,203 |
| 12 | | | | | | | | | | | **1,880** | 0,076 | 0,076 | 0,152 | 0,152 | 0,152 | 0,203 |
| 13 | | | | | | | | | | | | **2,108** | **2,413** | 0,127 | 0,127 | 0,152 | 0,178 |
| 14 | | | | | | | | | | | | | | 0,102 | 0,102 | 0,152 | 0,152 |
| 15 | | | | | | | | | | | | | | **2,819** | **3,353** | 0,147 | 0,127 |
| 16 | | | | | | | | | | | | | | | | 0,102 | 0,102 |
| | | | | | | | | | | | | | | | | **3,708** | **4,166** |

Last pass equals total depth of thread.

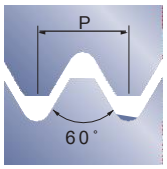
# In-Feed Recommendations




## UNIFIED "J" for Aircraft (UNJ), External

| No. of Passes | T.P.I | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 32 | 28 | 24 | 20 | 18 | 16 | 14 | 12 | 10 | 8 |
| | Radial infeed per pass (mm) | | | | | | | | | |
| 1 | 0,178 | 0,178 | 0,178 | 0,203 | 0,229 | 0,229 | 0,229 | 0,279 | 0,279 | 0,305 |
| 2 | 0,152 | 0,152 | 0,152 | 0,178 | 0,203 | 0,203 | 0,203 | 0,229 | 0,229 | 0,279 |
| 3 | 0,127 | 0,102 | 0,152 | 0,152 | 0,152 | 0,152 | 0,152 | 0,203 | 0,203 | 0,203 |
| 4 | 0,076 | 0,102 | 0,102 | 0,102 | 0,127 | 0,127 | 0,127 | 0,152 | 0,152 | 0,178 |
| 5 | **0,533** | 0,076 | 0,076 | 0,102 | 0,102 | 0,102 | 0,127 | 0,152 | 0,152 | 0,152 |
| 6 | | **0,610** | **0,660** | 0,076 | 0,076 | 0,102 | 0,102 | 0,102 | 0,127 | 0,152 |
| 7 | | | | **0,813** | **0,889** | 0,076 | 0,102 | 0,102 | 0,127 | 0,127 |
| 8 | | | | | | **0,991** | 0,076 | 0,076 | 0,102 | 0,127 |
| 9 | | | | | | | **1,118** | **1,295** | 0,102 | 0,127 |
| 10 | | | | | | | | | 0,076 | 0,102 |
| 11 | | | | | | | | | **1,549** | 0,102 |
| 12 | | | | | | | | | | 0,076 |
| | | | | | | | | | | **1,930** |

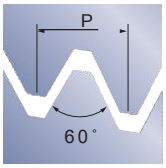
Last pass equals total depth of thread.




## Metric "J" for Aircraft (MJ), External

| No. of Passes | Pitch (mm) | | | | |
|---|---|---|---|---|---|
| | 1,0 | 1,5 | 1,75 | 2,0 | 2,5 |
| | Radial infeed per pass, (mm) | | | | |
| 1 | - | - | 0,2286 | 0,254 | - |
| 2 | - | - | 0,2032 | 0,2286 | - |
| 3 | - | - | 0,1524 | 0,1778 | - |
| 4 | - | - | 0,1524 | 0,1524 | - |
| 5 | - | - | 0,127 | 0,127 | - |
| 6 | - | - | 0,0762 | 0,127 | - |
| 7 | - | - | **0,9398** | 0,1016 | - |
| 8 | - | - | - | 0,0762 | - |
| | - | - | - | **1,2446** | - |

Last pass equals total depth of thread.

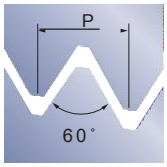



## National Pipe Taper Dryseal (NPTF) External and Internal

| No. of Passes | T.P.I | | | | |
|---|---|---|---|---|---|
| | 27 | 18 | 14 | 11.5 | 8 |
| | Radial infeed per pass (mm) | | | | |
| 1 | 0,178 | 0,229 | 0,254 | 0,254 | 0,254 |
| 2 | 0,152 | 0,203 | 0,229 | 0,254 | 0,229 |
| 3 | 0,127 | 0,152 | 0,152 | 0,203 | 0,229 |
| 4 | 0,102 | 0,127 | 0,152 | 0,152 | 0,203 |
| 5 | 0,102 | 0,102 | 0,127 | 0,152 | 0,178 |
| 6 | 0,076 | 0,102 | 0,127 | 0,127 | 0,152 |
| 7 | **0,737** | 0,102 | 0,102 | 0,102 | 0,152 |
| 8 | | 0,076 | 0,102 | 0,102 | 0,152 |
| 9 | | **1,092** | 0,102 | 0,102 | 0,127 |
| 10 | | | 0,076 | 0,102 | 0,127 |
| 11 | | | **1,422** | 0,102 | 0,127 |
| 12 | | | | 0,076 | 0,127 |
| 13 | | | | **1,727** | 0,102 |
| 14 | | | | | 0,102 |
| 15 | | | | | 0,102 |
| 16 | | | | | 0,102 |
| | | | | | **2,464** |

Last pass equals total depth of thread.

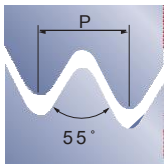
# In-Feed Recommendations




## National Pipe Taper (NPT) External & Internal

| No. of Passes | T.P.I | | | | |
|---|---|---|---|---|---|
| | 27 | 18 | 14 | 11.5 | 8 |
| | Radial infeed per pass (mm) | | | | |
| 1 | 0,203 | 0,229 | 0,229 | 0,229 | 0,254 |
| 2 | 0,152 | 0,178 | 0,203 | 0,203 | 0,229 |
| 3 | 0,127 | 0,152 | 0,178 | 0,178 | 0,203 |
| 4 | 0,102 | 0,152 | 0,152 | 0,152 | 0,203 |
| 5 | 0,102 | 0,127 | 0,152 | 0,152 | 0,178 |
| 6 | 0,076 | 0,127 | 0,127 | 0,152 | 0,178 |
| 7 | **0,762** | 0,102 | 0,127 | 0,152 | 0,178 |
| 8 | | 0,076 | 0,102 | 0,127 | 0,178 |
| 9 | | **1,143** | 0,102 | 0,127 | 0,152 |
| 10 | | | 0,076 | 0,102 | 0,152 |
| 11 | | | **1,448** | 0,102 | 0,152 |
| 12 | | | | 0,076 | 0,127 |
| 13 | | | | **1,753** | 0,127 |
| 14 | | | | | 0,102 |
| 15 | | | | | 0,076 |
| | | | | | **2,489** |

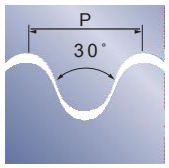
Last pass equals total depth of thread.




## British Standard Pipe Taper (BSPT) External & Internal

| No of Passes | T.P.I | | | | |
|---|---|---|---|---|---|
| | 28 | 19 | 14 | 11 | 8 |
| | Radial infeed per pass (mm) | | | | |
| 1 | 0,178 | 0,229 | 0,254 | 0,254 | 0,279 |
| 2 | 0,152 | 0,203 | 0,203 | 0,229 | 0,279 |
| 3 | 0,127 | 0,152 | 0,178 | 0,203 | 0,229 |
| 4 | 0,102 | 0,127 | 0,152 | 0,178 | 0,203 |
| 5 | 0,076 | 0,127 | 0,127 | 0,152 | 0,178 |
| 6 | **0,660** | 0,076 | 0,127 | 0,152 | 0,152 |
| 7 | | **0,914** | 0,102 | 0,127 | 0,152 |
| 8 | | | 0,076 | 0,127 | 0,152 |
| 9 | | | **1,219** | 0,076 | 0,127 |
| 10 | | | | **1,499** | 0,127 |
| 11 | | | | | 0,127 |
| 12 | | | | | 0,076 |
| | | | | | **2,083** |

Last pass equals total depth of thread.

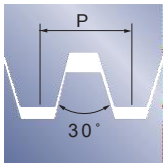



## Round DIN 405, External & Internal

| No of Passes | T.P.I | | | |
|---|---|---|---|---|
| | 10 | 8 | 6 | 4 |
| | Radial infeed per pass (mm) | | | |
| 1 | 0,229 | 0,229 | 0,279 | 0,356 |
| 2 | 0,229 | 0,229 | 0,254 | 0,330 |
| 3 | 0,203 | 0,203 | 0,229 | 0,305 |
| 4 | 0,203 | 0,203 | 0,229 | 0,279 |
| 5 | 0,152 | 0,178 | 0,203 | 0,279 |
| 6 | 0,127 | 0,152 | 0,203 | 0,254 |
| 7 | 0,102 | 0,152 | 0,178 | 0,254 |
| 8 | 0,076 | 0,127 | 0,152 | 0,229 |
| 9 | **1,321** | 0,102 | 0,152 | 0,203 |
| 10 | | 0,076 | 0,127 | 0,178 |
| 11 | | **1,651** | 0,102 | 0,152 |
| 12 | | | 0,076 | 0,127 |
| 13 | | | **2,184** | 0,127 |
| 14 | | | | 0,102 |
| | | | | **3,200** |

Last pass equals total depth of thread.

# In-Feed Recommendations

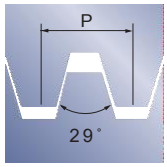



## Trapezoidal DIN 103

| No. of passes | Pitch (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1,5 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | Radial infeed per pass (mm) | | | | | | | |
| 1 | 0,229 | 0,254 | 0,279 | 0,279 | 0,305 | 0,356 | 0,356 | 0,381 |
| 2 | 0,203 | 0,229 | 0,229 | 0,229 | 0,305 | 0,330 | 0,330 | 0,330 |
| 3 | 0,152 | 0,178 | 0,203 | 0,229 | 0,254 | 0,305 | 0,305 | 0,330 |
| 4 | 0,127 | 0,152 | 0,152 | 0,203 | 0,229 | 0,279 | 0,279 | 0,330 |
| 5 | 0,102 | 0,127 | 0,152 | 0,178 | 0,203 | 0,254 | 0,254 | 0,279 |
| 6 | 0,076 | 0,127 | 0,127 | 0,178 | 0,203 | 0,254 | 0,254 | 0,279 |
| 7 | **0,889** | 0,102 | 0,127 | 0,152 | 0,203 | 0,203 | 0,254 | 0,254 |
| 8 | | 0,076 | 0,102 | 0,152 | 0,203 | 0,203 | 0,229 | 0,254 |
| 9 | | **1,245** | 0,102 | 0,152 | 0,178 | 0,203 | 0,203 | 0,229 |
| 10 | | | 0,102 | 0,152 | 0,152 | 0,203 | 0,203 | 0,229 |
| 11 | | | 0,102 | 0,127 | 0,152 | 0,178 | 0,203 | 0,229 |
| 12 | | | 0,076 | 0,127 | 0,127 | 0,152 | 0,203 | 0,203 |
| 13 | | | **1,753** | 0,102 | 0,127 | 0,152 | 0,178 | 0,203 |
| 14 | | | | **2,261** | 0,102 | 0,152 | 0,178 | 0,178 |
| 15 | | | | | **2,743** | 0,152 | 0,178 | 0,178 |
| 16 | | | | | | 0,127 | 0,127 | 0,178 |
| 17 | | | | | | **3,505** | **3,734** | 0,152 |
| 18 | | | | | | | | 0,152 |
| 19 | | | | | | | | 0,127 |
| | | | | | | | | **4,496** |

Last pass equals total depth of thread.

# In-Feed Recommendations

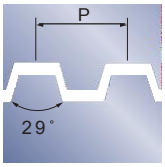



## ACME

| No. of Passes | Pitch (T.P.I) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 16 | 14 | 12 | 10 | 8 | 6 | 5 | 4 | 3 |
| | Radial infeed per pass (mm) | | | | | | | | |
| 1 | 0,229 | 0,229 | 0,254 | 0,254 | 0,279 | 0,330 | 0,356 | 0,356 | 0,381 |
| 2 | 0,203 | 0,203 | 0,203 | 0,229 | 0,254 | 0,279 | 0,330 | 0,330 | 0,356 |
| 3 | 0,178 | 0,178 | 0,178 | 0,203 | 0,203 | 0,229 | 0,254 | 0,305 | 0,330 |
| 4 | 0,152 | 0,152 | 0,152 | 0,178 | 0,178 | 0,203 | 0,229 | 0,279 | 0,279 |
| 5 | 0,127 | 0,127 | 0,127 | 0,152 | 0,152 | 0,178 | 0,229 | 0,254 | 0,279 |
| 6 | 0,076 | 0,102 | 0,127 | 0,127 | 0,127 | 0,178 | 0,203 | 0,254 | 0,279 |
| 7 | **0,965** | 0,076 | 0,102 | 0,127 | 0,127 | 0,152 | 0,203 | 0,203 | 0,279 |
| 8 | | **1,067** | 0,102 | 0,102 | 0,127 | 0,152 | 0,203 | 0,203 | 0,254 |
| 9 | | | **1,245** | 0,102 | 0,127 | 0,152 | 0,178 | 0,203 | 0,229 |
| 10 | | | | 0,102 | 0,102 | 0,152 | 0,152 | 0,178 | 0,229 |
| 11 | | | | **1,575** | 0,102 | 0,152 | 0,152 | 0,178 | 0,229 |
| 12 | | | | | 0,102 | 0,127 | 0,152 | 0,152 | 0,203 |
| 13 | | | | | **1,880** | 0,102 | 0,127 | 0,152 | 0,203 |
| 14 | | | | | | **2,515** | 0,102 | 0,152 | 0,178 |
| 15 | | | | | | | **2,845** | 0,152 | 0,178 |
| 16 | | | | | | | | 0,127 | 0,178 |
| 17 | | | | | | | | **3,480** | 0,178 |
| 18 | | | | | | | | | 0,152 |
| 19 | | | | | | | | | 0,127 |
| | | | | | | | | | **4,521** |

Last pass equals total depth of thread.

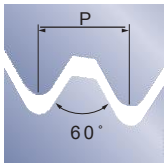
# In-Feed Recommendations




## STUB-ACME

| No. of passes | T.P.I | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 16 | 14 | 12 | 10 | 8 | 6 | 5 | 4 | 3 |
| | Radial infeed per pass (mm) | | | | | | | | |
| 1 | 0,203 | 0,229 | 0,229 | 0,229 | 0,254 | 0,279 | 0,279 | 0,305 | 0,356 |
| 2 | 0,152 | 0,178 | 0,178 | 0,203 | 0,203 | 0,203 | 0,254 | 0,279 | 0,279 |
| 3 | 0,127 | 0,152 | 0,152 | 0,178 | 0,203 | 0,203 | 0,203 | 0,254 | 0,279 |
| 4 | 0,102 | 0,127 | 0,127 | 0,152 | 0,178 | 0,178 | 0,203 | 0,203 | 0,229 |
| 5 | 0,102 | 0,102 | 0,102 | 0,152 | 0,152 | 0,152 | 0,178 | 0,203 | 0,203 |
| 6 | **0,686** | **0,787** | 0,102 | 0,127 | 0,152 | 0,152 | 0,152 | 0,178 | 0,203 |
| 7 | | | **0,889** | 0,102 | 0,127 | 0,152 | 0,152 | 0,152 | 0,203 |
| 8 | | | | **1,143** | 0,102 | 0,127 | 0,152 | 0,152 | 0,203 |
| 9 | | | | | **1,372** | 0,102 | 0,127 | 0,127 | 0,178 |
| 10 | | | | | | **1,549** | 0,102 | 0,127 | 0,152 |
| 11 | | | | | | | **1,803** | 0,102 | 0,127 |
| 12 | | | | | | | | 0,102 | 0,127 |
| 13 | | | | | | | | **2,184** | 0,127 |
| 14 | | | | | | | | | 0,102 |
| 15 | | | | | | | | | 0,102 |
| | | | | | | | | | **3,099** |

Last pass equals total depth of thread.




## API Thread Forms

| API Thread Forms | No. of passes/radial infeed per pass (mm) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Infeed | Passes | | | | | | | | | | | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **API-Buttress** 22ER5BUTT0.75 22IR5BUTT0.75 | **1,651** | 0,279 | 0,229 | 0,178 | 0,152 | 0,127 | 0,127 | 0,127 | 0,127 | 0,127 | 0,102 | 0,076 | - | - | - | - |
| 22ER5BUTT1.0 22IR5BUTT1.0 | **1,651** | 0,279 | 0,229 | 0,178 | 0,152 | 0,127 | 0,127 | 0,127 | 0,127 | 0,127 | 0,102 | 0,076 | - | - | - | - |
| **API Rd** 16ER10APIRD 16IR10APIRD | **1,448** | 0,279 | 0,203 | 0,152 | 0,152 | 0,127 | 0,127 | 0,127 | 0,102 | 0,102 | 0,076 | - | - | - | - | - |
| 16ER8APIRD 16IR8APIRD | **1,854** | 0,279 | 0,229 | 0,203 | 0,152 | 0,152 | 0,152 | 0,127 | 0,127 | 0,127 | 0,127 | 0,102 | 0,076 | - | - | - |
| **API-V-0.038R** 22ER4API382 22IR4API382 | **3,175** | 0,457 | 0,381 | 0,381 | 0,330 | 0,305 | 0,305 | 0,254 | 0,254 | 0,203 | 0,127 | 0,102 | 0,076 | - | - | - |
| 22ER4API383 22IR4API383 | **3,175** | 0,457 | 0,381 | 0,381 | 0,330 | 0,305 | 0,305 | 0,254 | 0,254 | 0,203 | 0,127 | 0,102 | 0,076 | - | - | - |
| **API-V-0.050** 27ER4API502 27IR4API502 | **3,861** | 0,457 | 0,381 | 0,356 | 0,330 | 0,305 | 0,305 | 0,279 | 0,254 | 0,254 | 0,229 | 0,203 | 0,203 | 0,127 | 0,102 | 0,076 |
| 27ER4API503 27IR4API503 | **3,835** | 0,457 | 0,381 | 0,356 | 0,330 | 0,305 | 0,279 | 0,279 | 0,254 | 0,254 | 0,229 | 0,203 | 0,203 | 0,127 | 0,102 | 0,076 |
| **API-V-0.040** 22ER5API403 22IR5API403 | **3,073** | 0,432 | 0,381 | 0,381 | 0,330 | 0,279 | 0,279 | 0,254 | 0,254 | 0,178 | 0,127 | 0,102 | 0,076 | - | - | - |

# In-Feed Recommendations

## Multi-point inserts

| External | Metric 60° (I.S.O) Pitch (mm) | | | | | Unified 60° (UN) T.P.I | | | | | Whitworth (W) T.P.I | | | NPT T.P.I |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1,0 | 1,5 | 2,0 | 2,5 | 3,0 | 20 | 18 | 16 | 14 | 12 | 19 | 14 | 11 | 11.5 |
| No. of Passes | Radial infeed per pass (mm) | | | | | Radial infeed per pass (mm) | | | | | Radial infeed per pass (mm) | | | |
| 1 | 0,356 | 0,356 | 0,483 | 0,457 | 0,559 | 0,432 | 0,483 | 0,381 | 0,432 | 0,533 | 0,483 | 0,483 | 0,457 | 0,508 |
| 2 | 0,330 | 0,330 | 0,483 | 0,432 | 0,533 | 0,381 | 0,432 | 0,356 | 0,406 | 0,483 | 0,432 | 0,432 | 0,432 | 0,019 |
| 3 | **0,686** | 0,279 | 0,330 | 0,406 | 0,483 | **0,813** | **0,914** | 0,279 | 0,330 | 0,356 | **0,914** | 0,330 | 0,381 | 0,432 |
| 4 | | **0,965** | **1,295** | 0,279 | 0,330 | | | **1,016** | **1,168** | **1,372** | | **1,245** | 0,279 | 0,254 |
| | | | | **1,575** | **1,905** | | | | | | | | **1,549** | **1,676** |

| Internal | Pitch (mm) | | | | | T.P.I | | | | | T.P.I | | | T.P.I |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1,0 | 1,5 | 2,0 | 2,5 | 3,0 | 20 | 18 | 16 | 14 | 12 | 19 | 14 | 11 | 11,5 |
| No. of Passes | Radial infeed per pass (mm) | | | | | Radial infeed per pass (mm) | | | | | Radial infeed per pass (mm) | | | |
| 1 | 0,330 | 0,330 | 0,457 | | | 0,356 | 0,483 | | | | 0,356 | 0,483 | 0,457 | 0,508 |
| 2 | 0,305 | 0,305 | 0,432 | | | 0,330 | 0,432 | | | | 0,305 | 0,432 | 0,432 | 0,483 |
| 3 | **0,635** | 0,254 | 0,330 | | | 0,254 | 0,330 | | | | 0,254 | 0,330 | 0,381 | 0,432 |
| 4 | | **0,889** | **1,219** | | | **0,940** | **1,245** | | | | **0,914** | **1,245** | 0,279 | 0,254 |
| | | | | | | | | | | | | | **1,549** | **1,676** |

# Recommended Number of Passes

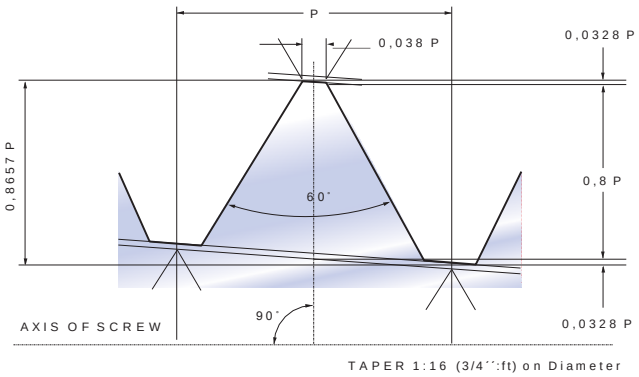
## Material group specific

| Threads Per Inch (T.P.I) | | | 24 | 20 | 16 | 14 | 12 | 10 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| Pitch (mm) | | | 1,0 | 1,25 | 1,5 | 1,75 | 2,0 | 2,5 | 3,0 |
| ISO | Material | Tensile Strength & Hardness | Recommended Number of Passes | | | | | | |
| P | Unalloyed Steels | <600 N/mm² <180HBN | 4 - 5 | 5 - 6 | 6 - 7 | 7 - 8 | 7 - 8 | 8 - 9 | 10 - 11 |
| | | <950 N/mm² <280HBN | 4 - 6 | 5 - 7 | 7 - 8 | 7 - 9 | 7 - 9 | 9 - 10 | 11 - 12 |
| | Alloyed Steels | 700 - 950 N/mm² 200 - 280 HBN | 4 - 6 | 5 - 7 | 7 - 8 | 7 - 9 | 7 - 9 | 9 - 10 | 11 - 12 |
| | | 950 - 1200 N/mm² 280 - 355 HBN | 5 - 6 | 6 - 9 | 7 - 10 | 8 - 10 | 8 - 10 | 10 - 12 | 112 - 14 |
| | | 1200 - 1400 N/mm² 355 - 415 HBN | 5 - 6 | 6 - 9 | 7 - 10 | 8 - 12 | 8 - 12 | 12 - 14 | 13 - 16 |
| M | Stainless Steels | Austenitic + Ferritic 300 series | 4 - 6 | 5 - 7 | 7 - 8 | 8 - 9 | 8 - 9 | 10 - 13 | 12 - 15 |
| | | Martensitic 400 series | 5 - 6 | 6 - 9 | 7 - 10 | 8 - 10 | 8 - 10 | 9 - 11 | 9 - 12 |
| | | Refractory P.H. | 5 - 8 | 6 - 10 | 7 - 12 | 8 - 11 | 8 - 11 | 9 - 12 | 10 - 14 |
| K | Cast Irons | Grey GG-Ft | 4 - 6 | 5 - 7 | 7 - 8 | 8 - 11 | 8 - 11 | 10 - 14 | 12 - 16 |
| | | Spheroidal-Ductile GGG-FGS | 4 - 8 | 5 - 9 | 7 - 10 | 8 - 11 | 8 - 11 | 8 - 14 | 10 - 16 |
| | | Malleable GTS - MN/MP | | | | | | | |
| N | Aluminium & Alloys | < 16% Si116HBN | 4 - 6 | 5 - 7 | 7 - 10 | 8 - 11 | 8 - 11 | 8 - 14 | 10 - 16 |
| | Aluminium & Silicon | > 16% Si92HBN | | | | | | | |
| S | High Temperature Alloys | Iron Based Cobalt Based | 4 - 6 | 5 - 7 | 7 - 8 | 8 - 10 | 8 - 10 | 9 - 11 | 9 - 12 |
| | | Nickel Based Titanium Based | 5 - 6 | 6 - 9 | 7 - 10 | 8 - 11 | 8 - 11 | 9 - 12 | 10 - 14 |
| H | Hard Steel | >1400 N/mm² >415 HBN | 6 - 8 | 6 - 10 | 7 - 12 | 9 - 12 | 9 - 12 | 13 - 14 | 14 - 16 |
| | Chilled Cast Iron | 1400 N/mm² 400 HBN | 6 - 8 | 6 - 10 | 7 - 12 | 9 - 12 | 9 - 12 | 13 - 14 | 14 - 16 |

## Recommended Number of Passes

| Threading Pitch (mm) | Threading T.P.I | Recommended No: of Passes |
|---|---|---|
| 0,5 | 48 | 4 - 6 |
| 1,0 | 24 | 4 - 8 |
| 1,25 | 20 | 5 - 10 |
| 1,5 | 16 | 6 - 12 |
| 2 | 12 | 7 - 12 |
| 3 | 8 | 9 - 16 |
| 4 | 6 | 11 - 18 |
| 5 | 5 | 12 - 20 |
| 6 | 4 | 12 - 22 |
| 8 | 3 | 15 - 24 |

# American Taper Pipe Threads




## American Taper Pipe Threads

**NPT - National Taper Pipe Threads**

NPTF - Dryseal National Taper Pipe Threads

API - (American Petroleum Institute) Line Pipe Threads

Many of the basic dimensions are common on these threads.

The critical difference is the tolerance limit of truncation at the root and crest of thread which alters its sealing characteristics when assembled.

## Limits of Truncation

### NPT - National Taper Pipe Threads

| | Truncation at Crest | | Truncation at Root | |
|---|---|---|---|---|
| T.P.I | Minimum Inch | Maximum Inch | Minimum Inch | Maximum Inch |
| 27 | 0.0012 | 0.0036 | 0.0012 | 0.0036 |
| 18 | 0.0018 | 0.0049 | 0.0018 | 0.0049 |
| 14 | 0.0024 | 0.0056 | 0.0024 | 0.0056 |
| 11.5 | 0.0029 | 0.0063 | 0.0029 | 0.0063 |
| 8 | 0.0041 | 0.0078 | 0.0041 | 0.0078 |

### NPTF - Dryseal National Taper Pipe Threads

| | Truncation at Crest | | Truncation at Root | |
|---|---|---|---|---|
| T.P.I | Minimum Inch | Maximum Inch | Minimum Inch | Maximum Inch |
| 27 | 0.0017 | 0.0035 | 0.0035 | 0.0052 |
| 18 | 0.0026 | 0.0043 | 0.0043 | 0.0061 |
| 14 | 0.0026 | 0.0043 | 0.0043 | 0.0061 |
| 11.5 | 0.0035 | 0.0052 | 0.0052 | 0.0078 |
| 8 | 0.0052 | 0.0069 | 0.0069 | 0.0095 |

### API - (American Petroleum Institute) Line Pipe Threads

| | Truncation at Crest | Truncation at Root |
|---|---|---|
| T.P.I | Inch | Inch |
| 27 | 0.0027 | 0.0012 |
| 18 | 0.0041 | 0.0018 |
| 14 | 0.0052 | 0.0024 |
| 11.5 | 0.0063 | 0.0029 |
| 8 | 0.0091 | 0.0041 |

## Thread Form Sizes

National Taper Pipe Thread, Dryseal Pipe Threads and API Linepipe Threads.

### NPT, NPTF & API Basic Sizes

| Nominal Diameter | Threads Per Inch |
|---|---|
| Inch | T.P.I |
| 1/8 & smaller | 27 |
| 1/4 | 18 |
| 3/8 | 18 |
| 1/2 | 14 |
| 3/4 | 14 |
| 1 | 11 1/2 |
| 1 1/4 | 11 1/2 |
| 1 1/2 | 11 1/2 |
| 2 | 11 1/2 |
| 2 1/2 & larger | 8 |

### British Standard Whitworth Series

| BSW basic sizes | |
|---|---|
| Nominal Diameter | Threads Per Inch |
| Inch | T.P.I |
| 1/8 | 40 |
| 3/16 | 24 |
| 1/4 | 20 |
| 5/16 | 18 |
| 3/8 | 16 |
| 7/16 | 14 |
| 1/2 | 12 |
| 9/16 | 12 |
| 5/8 | 11 |
| 11/16 | 11 |
| 3/4 | 10 |
| 7/8 | 9 |
| 1 | 9 |
| 1 1/8 | 7 |
| 1 1/4 | 7 |
| 1 1/2 | 6 |
| 1 3/4 | 5 |
| 2 | 4.5 |
| 2 1/4 | 4 |
| 2 1/2 | 4 |
| 2 3/4 | 3.5 |
| 3 | 3.5 |

### British Standard Fine Series

| BSF basic sizes | |
|---|---|
| Nominal Diameter | Threads Per Inch |
| Inch | T.P.I |
| 3/16 | 32 |
| 7/32 | 28 |
| 1/4 | 26 |
| 9/32 | 26 |
| 5/16 | 22 |
| 3/8 | 20 |
| 7/16 | 18 |
| 1/2 | 16 |
| 9/16 | 16 |
| 5/8 | 14 |
| 11/16 | 14 |
| 3/4 | 12 |
| 13/16 | 12 |
| 7/8 | 11 |
| 1 | 10 |
| 1 1/8 | 9 |
| 1 1/4 | 9 |
| 1 1/2 | 8 |
| 1 3/4 | 8 |

### British Standard Pipe Thread Series

| BSP & BSPT basic sizes | |
|---|---|
| Nominal Diameter | Threads Per Inch |
| Inch | T.P.I |
| 1/8 | 28 |
| 1/4 | 19 |
| 3/8 | 19 |
| 1/2 | 14 |
| 3/4 | 14 |
| 1 | 11 |
| 1 1/4 | 11 |
| 1 1/2 | 11 |
| 2 | 11 |
| 2 1/2 | 11 |
| 3 | 11 |
| 3 1/2 | 11 |
| 4 | 11 |
| 5 | 11 |
| 6 | 11 |

**Other Threads with Whitworth Form**

| | |
|---|---|
| BS Con/ BS Conduit | British Standard Conduit Thread |
| BSP.F | British Standard Pipe Fastening |
| BSP.L | British Standard Pipe Longscrew |
| Cycle | British Standard Cycle Threads |
| Gas/G series | British Standard Gas Threads |

### American Unified Coarse Series Threads

| UNC basic sizes | |
|---|---|
| Nominal Diameter | Threads Per Inch |
| Inch | T.P.I |
| No. 5 | 40 |
| No. 6 | 32 |
| No. 8 | 32 |
| No. 10 | 24 |
| No. 12 | 24 |
| 1/4 | 20 |
| 5/16 | 18 |
| 3/8 | 16 |
| 7/16 | 14 |
| 1/2 | 13 |
| 9/16 | 12 |
| 5/8 | 11 |
| 3/4 | 10 |
| 7/8 | 9 |
| 1 | 8 |
| 1 1/8 | 7 |
| 1 1/4 | 7 |
| 1 3/8 | 6 |
| 1 1/2 | 6 |
| 1 3/4 | 5 |
| 2 | 4.5 |
| 2 1/4 | 4.5 |

### American Unified Fine Series Threads

| UNF basic sizes | |
|---|---|
| Nominal Diameter | Threads Per Inch |
| Inch | T.P.I |
| No. 5 | 44 |
| No. 6 | 40 |
| No. 8 | 36 |
| No. 10 | 32 |
| No. 12 | 28 |
| 1/4 | 28 |
| 5/16 | 24 |
| 3/8 | 24 |
| 7/16 | 20 |
| 1/2 | 20 |
| 9/16 | 18 |
| 5/8 | 18 |
| 3/4 | 16 |
| 7/8 | 14 |
| 1 | 14 |
| 1 1/8 | 12 |
| 1 1/4 | 12 |
| 1 3/8 | 12 |
| 1 1/2 | 12 |

# Nomenclature



**Major Diameter**
The largest diameter of a screw thread.

**Pitch or Effective Diameter**
On straight threads it is where the thread profile and grooves are the same width.

**Minor or Root Diameter**
The smallest diameter of a screw thread.

**External Thread**
A thread produced on the external surface of a cylinder or cone.

**Depth of Thread**
The measured distance between the crest and root of the thread.

**Pitch**
A measured distance between corresponding points on adjacent thread forms when parallel to the centreline. Can be specified in millimetre or T.P.I.

**Root**
The innermost surface of the thread connecting the flanks.

**Crest**
The outermost surface of the thread connecting the flanks.

**Nominal Diameter**
The thread size from which all tolerances and limits are calculated.

**Internal Thread**
A thread produced on the internal surface of a cylinder or cone.

**Thread Angle**
The included angle between the individual flanks.

**Helix**
The angle of inclination when one rotation of the thread advances. This is the opposing angle where the thread lead and pitch diameter create a right angle triangle.

**Parallel Thread**
A thread produced around a cylinder.

**Taper Thread**
A thread produced around a cone of predetermined angle.

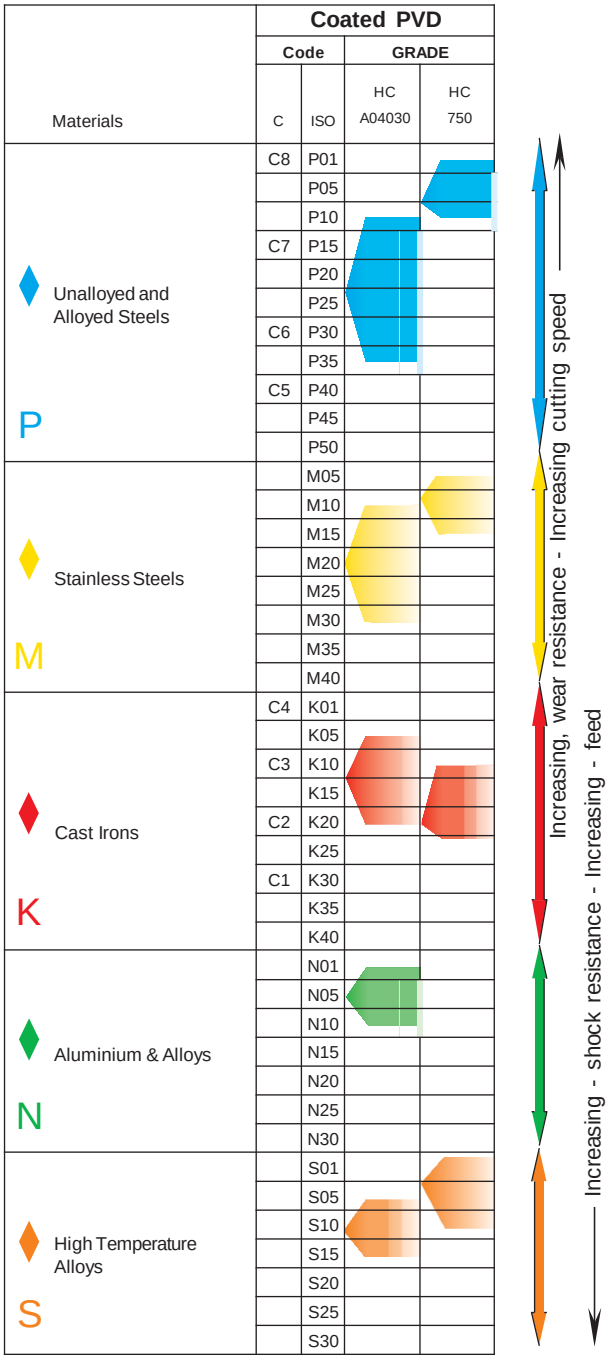
## Threading Grade Descriptions

- A04030 – A TiN PVD coated grade with a micrograin substrate for machining at lower speeds. Ideal for stainless steels and ductile materials.

- 750 – A TiAlN PVD coated grade with a micrograin substrate offering high temperature stability and a low coefficient of friction. Ideal for machining most materials at higher speeds.

| Cutting Speed (Vc) m/min | | | PVD Coated | | | |
|---|---|---|---|---|---|---|
| ISO | Material | Rm and Hardness | A04030 Max - Min HC Max | A04030 Max - Min HC Min | 750 Max - Min HC Max | 750 Max - Min HC Min |
| P | Unalloyed Steels | 600 N/mm² 180HBN | 270 | 135 | 450 | 200 |
| | | 950 N/mm² 280HBN | - | - | 290 | 130 |
| | Alloyed Steels | 700 - 950 N/mm² 200 - 280 HBN | - | - | 260 | 120 |
| M | Stainless Steels | Austenitic + Ferritic 300 series | - | - | 300 | 140 |
| | | Martensitic 400 series | - | - | 310 | 150 |
| | | Refractory P.H. | 100 | 50 | 160 | 75 |
| K | Cast Irons | Grey GG-Ft | 270 | 135 | 440 | 200 |
| | | Spheroidal-Ductile GGG-FGS | 230 | 115 | 380 | 180 |
| | | Malleable GTS - MN/MP | 155 | 80 | 260 | 120 |
| N | Aluminium & Alloys | < 16% Si116HBN | 915 | 365 | - | - |
| | Aluminium & Silicon | > 16% Si92HBN | 610 | 245 | - | - |
| S | High Temperature Alloys | Iron Based | 40 | 20 | 65 | 30 |
| | | Cobalt Based | 30 | 15 | 50 | 25 |
| | | Nickel Based | 35 | 20 | 55 | 25 |
| | | Titanium Based | 55 | 25 | 90 | 40 |

*Optimum Grade Performance*





A new range of indexable-insert drills has been introduced by H.BILZ for the efficient production of holes from 13.5mm to 63mm diameter in ductile, long chipping materials such as stainless steels.

Called Posidrill Plus™, it is intended for producing short holes up to three times (optionally four times) diameter. The system is ideal for drilling stacked material, as the positioning of the inserts in the body renders all the machined material to chips, allowing a smooth transition from plate to plate by avoiding the formation of slugs that would otherwise impede the drill.

The drills use JEMX-style inserts with three cutting edges in four sizes, with up to 4 inserts loaded on alternate flutes to cover the range of diameters. The inserts are available in grade ST100 , a wear resistant, micrograin structure combining hardness and toughness. It has a titanium-aluminium-nitride PVD coating offering high lubricity and hence low friction cutting. Both carbide structure and coating process are proprietary to H . B I L Z .

The sharp, positive top rake of the -60 geometry affords a high density of carbide grains at the cutting edge where it is most needed for cutting strong, abrasive, ductile materials. Identical inserts may be used on the inner and outer positions of the drill body, as toughness for cutting the hole centre is combined with wear resistance for cutting the periphery.

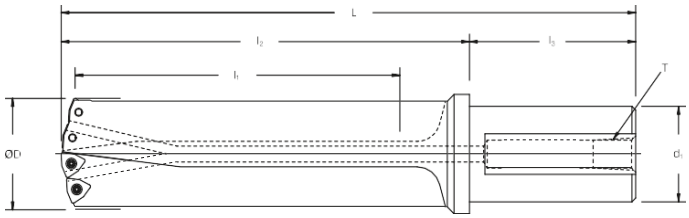
In each flute of larger diameter drills, multiple inserts may be used to break the cut into smaller sections, creating more manageable, easily evacuated chips.

Another benefit is a reduction in power consumption of the machine tool, which is already reduced owing to the positive geometry, irrespective of whether one is drilling on a lathe or a mill.

For example, when machining a 316 stainless steel valve body on a machining centre at 135 m/min surface speed using a 25 mm diameter drill, power consumption is only 10.4kW. During comparative tests on the valve, drilling an 18 mm diameter hole to a depth of 27 mm, Stellram was able to increase feed rate by 50 per cent and surface speed by 84 per cent compared with the incumbent tool used for the application. The resulting cycle time reduction from 28.4 to 9.5 seconds represented a three-fold saving.

An integral round shank is standard on Posidrill Plus™, although special connections such as ABS and HSK are available.

The new Posidrill Plus™ indexable-insert drilling system from H.BILZ is ideal for machining stacked stainless steel plates.




## Drill Bodies

| | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| EDP | Part Number | ØD | $d_1$ | L | $l_1$ | $l_2$ | $l_3$ | T | No of inserts | JEMX Size |
| 029571 | **P69003JEMX1350W040** | 13,5 | 20,0 | 109,3 | 40,5 | 57,5 | 50,0 | 1/8" NPT | 2 | JEMX0302..F |
| *029572 | **P69003JEMX1400W042** | 14,0 | 20,0 | 110,9 | 42,0 | 59,0 | 50,0 | 1/8" NPT | 2 | JEMX0302..F |
| *029573 | **P69003JEMX1450W043** | 14,5 | 20,0 | 112,5 | 43,5 | 60,5 | 50,0 | 1/8" NPT | 2 | JEMX0302..F |
| 029574 | **P69003JEMX1500W045** | 15,0 | 20,0 | 114,1 | 45,0 | 62,0 | 50,0 | 1/8" NPT | 2 | JEMX0302..F |
| *029575 | **P69003JEMX1550W046** | 15,5 | 20,0 | 115,7 | 46,5 | 63,5 | 50,0 | 1/8" NPT | 2 | JEMX0302..F |
| 029576 | **P69003JEMX1600W048** | 16,0 | 20,0 | 117,2 | 48,0 | 65,0 | 50,0 | 1/8" NPT | 2 | JEMX0302..F |
| *029577 | **P69003JEMX1650W049** | 16,5 | 20,0 | 118,8 | 49,5 | 66,5 | 50,0 | 1/8" NPT | 2 | JEMX0302..F |
| 029578 | **P69003JEMX1700W051** | 17,0 | 20,0 | 120,4 | 51,0 | 68,0 | 50,0 | 1/8" NPT | 2 | JEMX0302..F |
| 029579 | **P69004JEMX1750W052** | 17,5 | 20,0 | 124,8 | 52,5 | 72,5 | 50,0 | 1/8" NPT | 2 | JEMX0402..F |
| 029580 | **P69004JEMX1800W053** | 18,0 | 20,0 | 126,3 | 54,0 | 74,0 | 50,0 | 1/8" NPT | 2 | JEMX0402..F |
| 029581 | **P69004JEMX1850W055** | 18,5 | 20,0 | 127,9 | 55,5 | 75,5 | 50,0 | 1/8" NPT | 2 | JEMX0402..F |
| 029582 | **P69004JEMX1900W057** | 19,0 | 20,0 | 129,6 | 57,0 | 77,0 | 50,0 | 1/8" NPT | 2 | JEMX0402..F |
| 029583 | **P69004JEMX1950W058** | 19,5 | 20,0 | 131,1 | 58,5 | 78,5 | 50,0 | 1/8" NPT | 2 | JEMX0402..F |
| 029584 | **P69004JEMX2000W060** | 20,0 | 20,0 | 132,7 | 60,0 | 80,0 | 50,0 | 1/8" NPT | 2 | JEMX0402..F |
| 029585 | **P69004JEMX2050W061** | 20,5 | 20,0 | 134,3 | 61,5 | 81,5 | 50,0 | 1/8" NPT | 2 | JEMX0402..F |
| 029586 | **P69004JEMX2100W063** | 21,0 | 20,0 | 135,8 | 63,0 | 83,0 | 50,0 | 1/8" NPT | 2 | JEMX0402..F |
| 029587 | **P69004JEMX2150W064** | 21,5 | 20,0 | 137,4 | 64,5 | 84,5 | 50,0 | 1/8" NPT | 2 | JEMX0402..F |
| 029588 | **P69005JEMX2200W066** | 22,0 | 25,0 | 145,3 | 66,0 | 86,0 | 56,0 | 1/8" NPT | 2 | JEMX0503..F |
| 029589 | **P69005JEMX2250W067** | 22,5 | 25,0 | 146,9 | 67,5 | 87,5 | 56,0 | 1/8" NPT | 2 | JEMX0503..F |
| 029590 | **P69005JEMX2300W069** | 23,0 | 25,0 | 148,4 | 69,0 | 89,0 | 56,0 | 1/8" NPT | 2 | JEMX0503..F |
| 029591 | **P69005JEMX2350W070** | 23,5 | 25,0 | 150.0 | 70,5 | 90,5 | 56,0 | 1/8" NPT | 2 | JEMX0503..F |
| 029592 | **P69005JEMX2400W072** | 24,0 | 25,0 | 151,6 | 72,0 | 92,0 | 56,0 | 1/8" NPT | 2 | JEMX0503..F |
| 029593 | **P69005JEMX2450W073** | 24,5 | 25,0 | 153,1 | 73,5 | 93,5 | 56,0 | 1/8" NPT | 2 | JEMX0503..F |
| 029594 | **P69005JEMX2500W075** | 25,0 | 25,0 | 154,7 | 75,0 | 95,0 | 56,0 | 1/8" NPT | 2 | JEMX0503..F |
| 029595 | **P69005JEMX2550W076** | 25,5 | 25,0 | 156,2 | 76,5 | 96,5 | 56,0 | 1/8" NPT | 2 | JEMX0503..F |
| 029596 | **P69005JEMX2600W078** | 26,0 | 25,0 | 157,8 | 78,0 | 98,0 | 56,0 | 1/8" NPT | 2 | JEMX0503..F |
| 029597 | **P69005JEMX2650W079** | 26,5 | 25,0 | 159,4 | 79,5 | 99,5 | 56,0 | 1/8" NPT | 2 | JEMX0503..F |
| 029598 | **P69005JEMX2700W081** | 27,0 | 25,0 | 160,9 | 81,0 | 101,0 | 56,0 | 1/8" NPT | 2 | JEMX0503..F |
| 029599 | **P69005JEMX2800W084** | 28,0 | 25,0 | 164,1 | 84,0 | 104,0 | 56,0 | 1/8" NPT | 2 | JEMX0503..F |
| 029600 | **P69005JEMX2900W087** | 29,0 | 25,0 | 167,2 | 87,0 | 107,0 | 56,0 | 1/8" NPT | 2 | JEMX0503..F |
| 029601 | **P69006JEMX3000W090** | 30,0 | 32,0 | 174,3 | 90,0 | 110,0 | 60,0 | 1/4" NPT | 2 | JEMX0604..F |
| 029602 | **P69006JEMX3100W093** | 31,0 | 32,0 | 177,4 | 93,0 | 113,0 | 60,0 | 1/4" NPT | 2 | JEMX0604..F |
| 029603 | **P69006JEMX3200W096** | 32,0 | 32,0 | 180,6 | 96,0 | 116,0 | 60,0 | 1/4" NPT | 2 | JEMX0604..F |
| 029604 | **P69006JEMX3300W099** | 33,0 | 32,0 | 183,7 | 99,0 | 119,0 | 60,0 | 1/4" NPT | 2 | JEMX0604..F |
| 029605 | **P69006JEMX3400W102** | 34,0 | 32,0 | 186,8 | 102,0 | 122,0 | 60,0 | 1/4" NPT | 2 | JEMX0604..F |
| 029606 | **P69006JEMX3500W105** | 35,0 | 32,0 | 189,9 | 105,0 | 125,0 | 60,0 | 1/4" NPT | 2 | JEMX0604..F |
| 029607 | **P69006JEMX3600W108** | 36,0 | 32,0 | 193,1 | 108,0 | 128,0 | 60,0 | 1/4" NPT | 2 | JEMX0604..F |
| 029608 | **P69006JEMX3700W111** | 37,0 | 32,0 | 196,1 | 111,0 | 131,0 | 60,0 | 1/4" NPT | 2 | JEMX0604..F |
| 029609 | **P69006JEMX3800W114** | 38,0 | 32,0 | 199,2 | 114,0 | 134,0 | 60,0 | 1/4" NPT | 2 | JEMX0604..F |
| 029610 | **P69006JEMX3900W117** | 39,0 | 32,0 | 207,3 | 117,0 | 142,0 | 60,0 | 1/4" NPT | 2 | JEMX0604..F |

## Drill Bodies

| | | Dimensions (mm) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| EDP | Part Number | ØD | $d_1$ | L | $l_1$ | $l_2$ | $l_3$ | T | No of inserts | JEMX Size |
| 029611 | **P69005JEMX4000W120** | 40,0 | 40,0 | 220,3 | 120,0 | 145,0 | 70,0 | 1/4" NPT | 3 | JEMX0503..F |
| *029612 | **P69005JEMX4100W123** | 41,0 | 40,0 | 223,4 | 123,0 | 148,0 | 70,0 | 1/4" NPT | 3 | JEMX0503..F |
| *029613 | **P69005JEMX4200W126** | 42,0 | 40,0 | 226,5 | 126,0 | 151,0 | 70,0 | 1/4" NPT | 3 | JEMX0503..F |
| *029614 | **P69005JEMX4300W129** | 43,0 | 40,0 | 229,6 | 129,0 | 154,0 | 70,0 | 1/4" NPT | 3 | JEMX0503..F |
| *029615 | **P69005JEMX4400W132** | 44,0 | 40,0 | 237,7 | 132,0 | 162,0 | 70,0 | 1/4" NPT | 4 | JEMX0503..F |
| 029616 | **P69005JEMX4500W135** | 45,0 | 40,0 | 240,9 | 135,0 | 165,0 | 70,0 | 1/4" NPT | 4 | JEMX0503..F |
| *029617 | **P69005JEMX4600W138** | 46,0 | 40,0 | 243,8 | 138,0 | 168,0 | 70,0 | 1/4" NPT | 4 | JEMX0503..F |
| *029618 | **P69005JEMX4700W141** | 47,0 | 40,0 | 246,9 | 141,0 | 171,0 | 70,0 | 1/4" NPT | 4 | JEMX0503..F |
| *029619 | **P69005JEMX4800W144** | 48,0 | 40,0 | 250,2 | 144,0 | 174,0 | 70,0 | 1/4" NPT | 4 | JEMX0503..F |
| *029620 | **P69005JEMX4900W147** | 49,0 | 40,0 | 253,6 | 147,0 | 177,0 | 70,0 | 1/4" NPT | 4 | JEMX0503..F |
| 029621 | **P69005JEMX5000W150** | 50,0 | 40,0 | 256,6 | 150,0 | 180,0 | 70,0 | 1/4" NPT | 4 | JEMX0503..F |
| *029622 | **P69005JEMX5100W153** | 51,0 | 50,0 | 269,8 | 153,0 | 183,0 | 80,0 | 1/4" NPT | 4 | JEMX0503..F |
| *029623 | **P69006JEMX5200W156** | 52,0 | 50,0 | 274,6 | 156,0 | 188,0 | 80,0 | 1/4" NPT | 4 | JEMX0604..F |
| *029624 | **P69006JEMX5300W159** | 53,0 | 50,0 | 277,8 | 159,0 | 191,0 | 80,0 | 1/4" NPT | 4 | JEMX0604..F |
| *029625 | **P69006JEMX5400W162** | 54,0 | 50,0 | 280,8 | 162,0 | 194,0 | 80,0 | 1/4" NPT | 4 | JEMX0604..F |
| *029626 | **P69006JEMX5500W165** | 55,0 | 50,0 | 283,9 | 165,0 | 197,0 | 80,0 | 1/4" NPT | 4 | JEMX0604..F |
| *029627 | **P69006JEMX5600W168** | 56,0 | 50,0 | 287,2 | 168,0 | 200,0 | 80,0 | 1/4" NPT | 4 | JEMX0604..F |
| *029628 | **P69006JEMX5700W171** | 57,0 | 50,0 | 290,1 | 171,0 | 203,0 | 80,0 | 1/4" NPT | 4 | JEMX0604..F |
| *029629 | **P69006JEMX5800W174** | 58,0 | 50,0 | 293,2 | 174,0 | 206,0 | 80,0 | 1/4" NPT | 4 | JEMX0604..F |
| *029630 | **P69006JEMX5900W177** | 59,0 | 50,0 | 296,4 | 177,0 | 209,0 | 80,0 | 1/4" NPT | 4 | JEMX0604..F |
| *029631 | **P69006JEMX6000W180** | 60,0 | 50,0 | 302,7 | 180,0 | 215,0 | 80,0 | 1/4" NPT | 4 | JEMX0604..F |
| *029632 | **P69006JEMX6100W183** | 61,0 | 50,0 | 305,7 | 183,0 | 218,0 | 80,0 | 1/4" NPT | 4 | JEMX0604..F |
| *029633 | **P69006JEMX6200W186** | 62,0 | 50,0 | 308,9 | 186,0 | 221,0 | 80,0 | 1/4" NPT | 4 | JEMX0604..F |
| *029634 | **P69006JEMX6300W189** | 63,0 | 50,0 | 311,9 | 189,0 | 224,0 | 80,0 | 1/4" NPT | 4 | JEMX0604..F |

EDP# = Internal Item Number: Please quote this number when ordering
* Delivery 4 – 6 weeks and minimum order quantity 2 pieces.
Check local pricelist for stock availability

**Note: Intermediate sizes are available on request**

Special length-to-diameter ratios, up to 4 x diameter, are available upon request.
ABS, HSK and other special shanks are also available upon request.

## Inserts

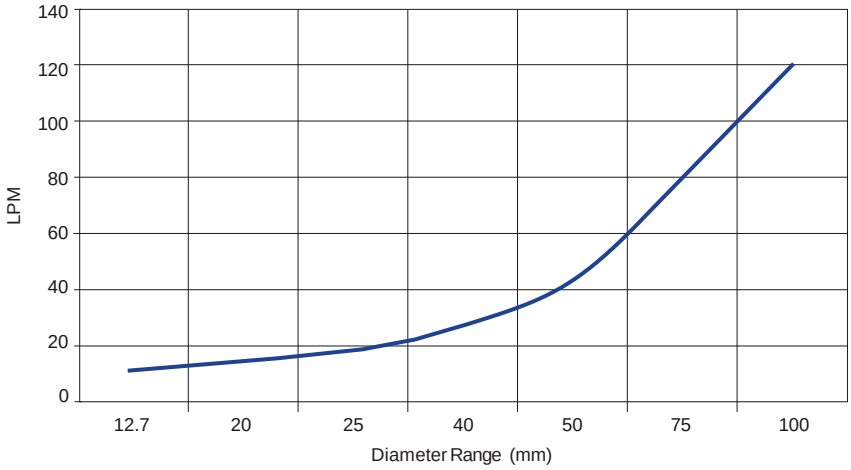
| EDP | Description | Grade | EDP | Screw | | Screw Driver |
|---|---|---|---|---|---|---|
| 029354 | JEMX 030204F | ST100 | 029341 | F2004TP | | T6 |
| 029355 | JEMX 030208F | ST100 | 029341 | F2004TP | | T6 |
| 029356 | JEMX 040204F | ST100 | 015061 | F2507T | | T7 |
| 029357 | JEMX 040208F | ST100 | 015061 | F2507T | | T7 |
| 029358 | JEMX 050308F | ST100 | 015063 | F3008T | | T9 |
| 029359 | JEMX 060408F | ST100 | 029460 | D3509T | | T10 |
| 029360 | JEMX 080508F | ST100 | 029460 | D4011T | | T15 |
| 029361 | JEMX 080412F | ST100 | 029460 | D4011T | | T15 |

## Star Guide Key to Recommended Inserts

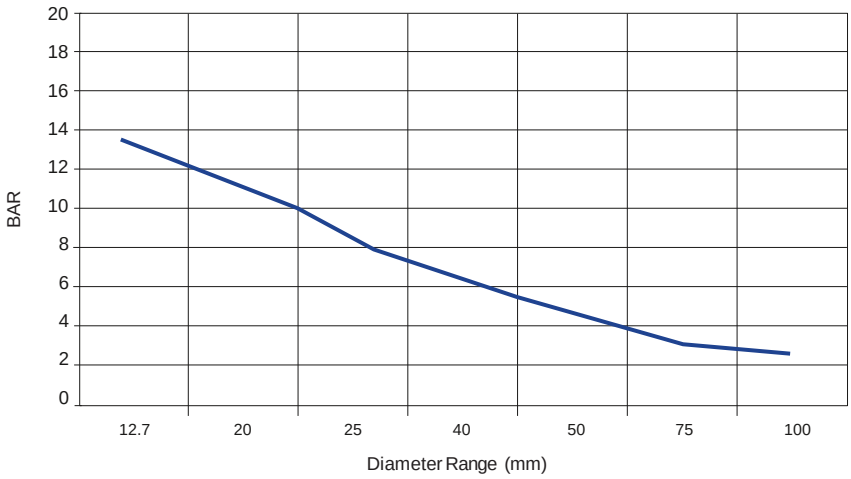
| Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |



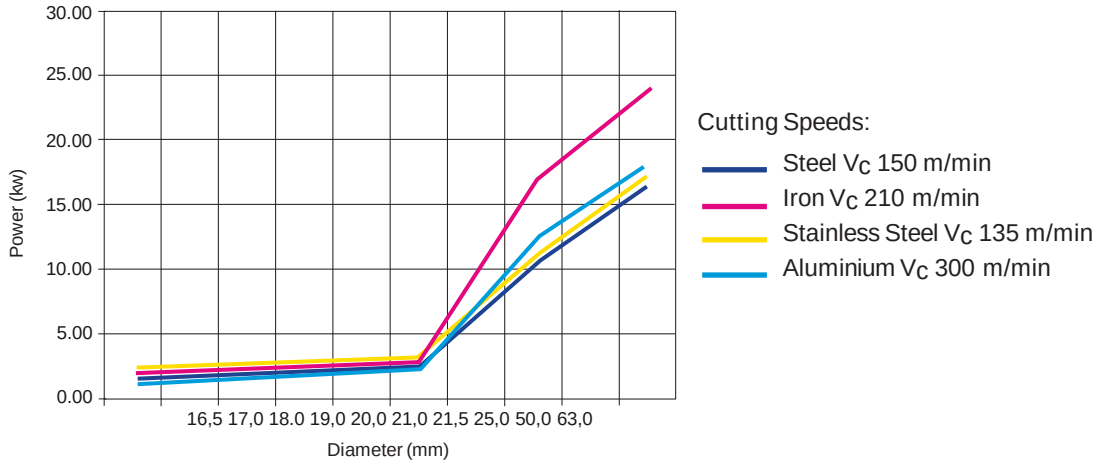
## Coolant Flow – Litres per minute (LPM) by diameter

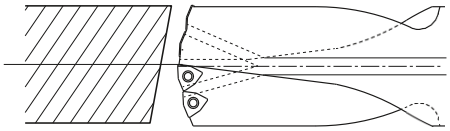



## Coolant Pressure – kg/cm² (BAR) by diameter

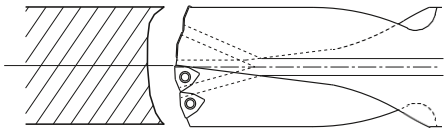



## Power Consumption Guidelines

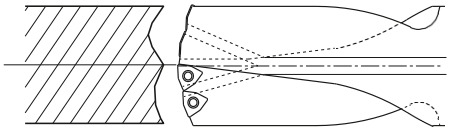




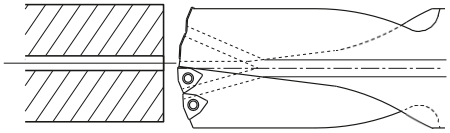
Drilled surfaces should be flat whenever possible. If the surface angle exceeds 2°, reduce feed by 1/3.



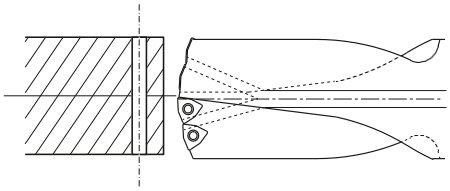
Reduce feed by 1/3 when drilling a concave surface.



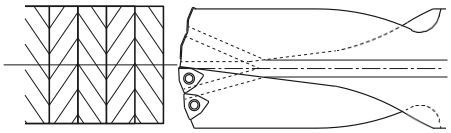
Reduce feed on irregular surfaces to prevent insert chipping. This may also be the case when breaking through the back end of the hole.



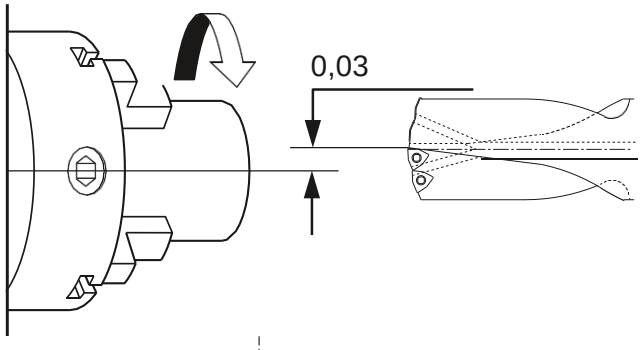
Drill deflection may occur if a predrilled hole exists larger than 1/4 of the finished hole.



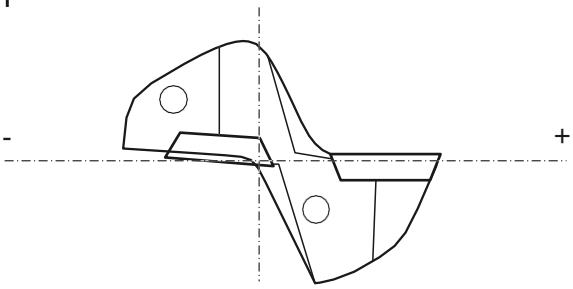
Reduce the feed when passing through a cross-drilled hole larger than 1/4 of the drill diameter.



Stacked plates and welded assemblies can be drilled with Posidrill Plus™.




For best results, a runout of 0,03mm between the the workpiece and drill centerline should not be exceeded.

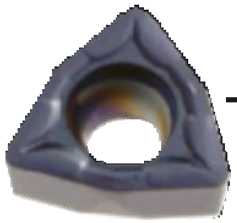



The peripheral insert should be parallel to the machine's axis of transverse movement when mounting the drill.

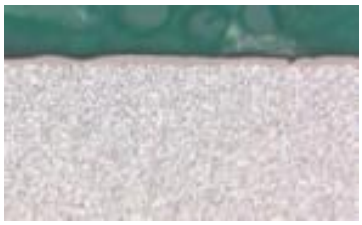
# Posidrill Plus™ Trouble Shooting Chart



| PROBLEM | SYMPTOM: Long unmanageable chips | Chips jamming in the hole | Excessive wear on outer insert | Outer insert chipping | Inner insert chipping | Hole oversize | Hole undersize | Drill body rubbing in hole | Bad surface finish | Drill back cutting on retraction | SOLUTION |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Incorrect cutting conditions | ■ | | ■ | ■ | ■ | | | | ■ | ■ | Check recommended speeds and feeds and adjust accordingly |
| Insufficient coolant pressure | ■ | ■ | ■ | | | | | | ■ | | Check coolant lines for leaks. Increase pump pressure |
| Inferior coolant quality | | | ■ | | | | | | ■ | | Check emulsion; should be strongest recommended by supplier. Do not use synthetic coolant when drilling stainless steels |
| Drill off center | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | Check alignment; maximum allowable with stationary drills is +/- 0.03mm per 25mm in X and Y axis. Maximum allowable with rotating drill is 0.13mm T.I.R. |
| Deflection | | | | ■ | | | | ■ | ■ | ■ | Reduce feed. Check alignment |
| Vibration | | | ■ | ■ | ■ | | | | ■ | | Check rigidity of workpiece. Reduce speed. Increase feed |
| Recutting chips | | | | ■ | ■ | | | | ■ | | Increase coolant pressure. Check speed and feed |
| Feed rate too high | | ■ | | ■ | ■ | | | | | ■ | Reduce feed |
| Feed rate too low | ■ | ■ | | | | | | | | | Increase feed |
| Speed too high | | | ■ | | | | | | | | Reduce speed |
| Drill incorrectly located | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | Check shank and toolholder for damage, clean thoroughly and replace |
| Inserts incorrectly located | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | Check pocket and screw for damage, clean thoroughly and replace |



# GEOMETRY F *Grade ST100*



Micrograin carbide with TiAlN PVD coating and lubricity layer ST100 offers excellent wear resistance due to its micrograin substrate. Its lubricity layer offers a lower coefficient of friction, especially in softer materials. The F geometry offers excellent chip control in softer materials.

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# Feed per diameter range



| ISO | Material | R m an d Hardness | Fn= Feed per revolution mm/rev: min. & max. | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Diameter range inserts (mm) | | | | | |
| | | | 13,5 - 17,0 | 17,5 - 21,5 | 22,0 - 29.0 | 30.0 - 40,0 | 41,0 - 51,0 | 52,0 - 63,0 |
| P | Unalloyed Steels | <600 N/mm² <180HBN | 0,038 - 0,051 | 0,064 - 0,076 | 0,064 - 0,089 | 0,064 - 0,102 | 0,064 - 0,089 | 0,064 - 0,102 |
| | | <950 N/mm² <280HBN | 0,038 - 0,051 | 0,064 - 0,076 | 0,064 - 0,089 | 0,064 - 0,102 | 0,064 - 0,089 | 0,064 - 0,102 |
| | Alloyed Steels | 700-950 N/mm² 200-280 HBN | 0,051 - 0,076 | 0,051 - 0,127 | 0,076 - 0,152 | 0,102 - 0,178 | 0,076 - 0,152 | 0,102 - 0,178 |
| | | 950-1200 N/mm² 280-355 HBN | 0,038 - 0,064 | 0,038 - 0,102 | 0,064 - 0,127 | 0,076 - 0,152 | 0,064 - 0,127 | 0,076 - 0,152 |
| | | 1200-1400 N/mm² 355-415 HBN | 0,025 - 0,051 | 0,051 - 0,076 | 0,051 - 0,102 | 0,064 - 0,127 | 0,051 - 0,102 | 0,064 - 0,127 |
| M | Stainless Steels | Austenitic + Ferritic 300 series | 0,038 - 0,064 | 0,051 - 0,102 | 0,076 - 0,102 | 0,089 - 0,127 | 0,076 - 0,102 | 0,089 - 0,127 |
| | | Martensitic 400 series | 0,038 - 0,056 | 0,051 - 0,089 | 0,076 - 0,089 | 0,089 - 0,114 | 0,076 - 0,089 | 0,089 - 0,114 |
| | | Refractory P.H. | - | - | - | - | - | - |
| K | Cast Irons | Grey GG-Ft | 0,038 - 0,089 | 0,064 - 0,152 | 0,076 - 0,178 | 0,076 - 0,203 | 0,076 - 0,178 | 0,076 - 0,203 |
| | | Spheroidal-Ductile GGG-FGS | 0,038 - 0,076 | 0,051 - 0,152 | 0,076 - 0,178 | 0,076 - 0,191 | 0,076 - 0,178 | 0,076 - 0,191 |
| | | Malleable GTS - MN/MP | 0,038 - 0,064 | 0,051 - 0,127 | 0,076 - 0,152 | 0,076 - 0,152 | 0,076 - 0,152 | 0,076 - 0,152 |
| N | Aluminium & Alloys | < 16% Si116HBN | 0,051 - 0,102 | 0,076 - 0,152 | 0,076 - 0,191 | 0,076 - 0,229 | 0,076 - 0,191 | 0,076 - 0,229 |
| | | > 16% Si92HBN | 0,051 - 0,076 | 0,076 - 0,127 | 0,076 - 0,152 | 0,076 - 0,178 | 0,076 - 0,152 | 0,076 - 0,178 |
| S | High Temperature Alloys | Iron Based | - | - | - | - | - | - |
| | | Cobalt Based | - | - | - | - | - | - |
| | | Nickel Based | - | - | - | - | - | - |
| | | Titanium Based | 0,051 - 0,089 | 0,064 - 0,102 | 0,051 - 0,114 | 0,064 - 0,127 | 0,051 - 0,114 | 0,064 - 0,127 |
| H | Hard Steel | >1400 N/mm² >415 HBN | - | - | - | - | - | - |
| | Chilled Cast Iron | 1400 N/mm² 400 HBN | - | - | - | - | - | - |

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| Material Designations | | | | | | | |
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| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# Cutting Speed ($V_c$) metres/minute

| | | | ST100 |
|---|---|---|---|
| ISO | Material | Rm and d Hardness | Speed ($V_c$) m/min max – min |
| P | Unalloyed Steels | <600 N/mm² <180HBN | 180 - 290 |
| | | <950 N/mm² <280HBN | 180 - 275 |
| | Alloyed Steels | 700-950 N/mm² 200-280 HBN | 120 - 245 |
| | | 950-1200 N/mm² 280-355 HBN | 105 - 200 |
| | | 1200-1400 N/mm² 355-415 HBN | 65 - 135 |
| M | Stainless Steels | Austenitic + Ferritic 300 series | 120 - 215 |
| | | Martensitic 400 series | 125 - 220 |
| | | Refractory P.H. | - |
| K | Cast Irons | Grey GG-Ft | 120 - 335 |
| | | Spheroidal-Ductile GGG-FGS | 120 - 275 |
| | | Malleable GTS - MN/MP | 105 - 180 |
| N | Aluminium & Alloys | < 16% Si 116HBN | 245 - 520 |
| | | > 16% Si 92HBN | 150 - 305 |
| S | High Temperature Alloys | Iron Based | - |
| | | Cobalt Based | - |
| | | Nickel Based | - |
| | | Titanium Based | 20 - 45 |
| H | Hard Materials (52-56 HRC) | Hard Materials (52-56 HRC) | - |

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| Material Designations | | | | | | | |
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# Materials Cross Reference Chart

| Material Group | Country/Standard | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Rm (N/mm²) | Allvac Designation | Allegheny Ludlum Designation | GERMANY/ITALY | | U.K. | FRANCE | USA |
| | | | | W.-Nr. | DIN | BS | AFNOR | AIS/SAE |
| Free cutting steel | 390-710 | | | 1.0722 | 10SPb20 | | 10PbF2 | |
| Free cutting steel | 410-710 | | | 1.0715 | 9SMn28 | 230M07 | S250 | 1213 |
| Free cutting steel | 410-710 | | | 1.0718 | 9SMnPb28 | | S250Pb | 12L13 |
| Free cutting steel | 430-740 | | | 1.0736 | 9SMn36 | 240M07 | S300 | 1215 |
| Free cutting steel | 430-740 | | | 1.0737 | 9SMnPb36 | | S300Pb | 12L14 |
| Heat treatable steel | 500-650 | | | 1.0402 | C22 | 050A20 | CC20 | 1020 |
| Heat treatable steel | 500-650 | | | 1.1158 | Ck25 | | | 1025 |
| Free cutting steel | 510-740 | | | 1.0726 | 35S20 | 212M36 | 35MF4 | 1140 |
| Superficial hardening steel | 540-730 | | | 1.1183 | Cf35 | 060A35 | XC38TS | 1035 |
| Heat treatable steel | 550-750 | | | 1.0501 | C35 | 060A35 | CC35 | 1035 |
| Case hardening steel | 590-780 | | | 1.0401 | C15 | 080M15 | CC12 | 1015 |
| Case hardening steel | 590-780 | | | 1.1141 | Ck15 | 080M15 | XC12 | 1015 |
| Heat treatable steel | 630-800 | | | 1.0503 | C45 | 080M46 | CC45 | 1045 |
| Heat treatable steel | 630-800 | | | 1.1191 | Ck45 | 080M46 | XC42 | 1045 |
| Superficial hardening steel | 640-830 | | | 1.1213 | Cf53 | 060A52 | XC48TS | 1050 |
| Carbon tool steel | 640-830 | | | 1.1545 | C105W1 | | Y1105 | W.110 |
| Heat treatable steel | 640-840 | | | 1.1170 | 28Mn6 | 160M28 | 20M5 | 1330 |
| Heat treatable steel | 640-880 | | | 1.1167 | 36Mn5 | | 40M5 | 1335 |
| Heat treatable steel | 690-930 | | | 1.1157 | 40Mn4 | 150M36 | 35M5 | 1039 |
| Carbon tool steel | 650-750 | | | 1.1663 | C125W | | Y2120 | W.112 |
| Heat treatable steel | 700-900 | | | 1.0535 | C55 | 070M55 | 1055 | |
| Heat treatable steel | 700-900 | | | 1.1203 | Ck55 | 070M55 | XC55 | 1055 |
| Heat treatable steel | 750-900 | | | 1.0601 | C60 | 080A62 | CC55 | 1060 |
| Heat treatable steel | 750-950 | | | 1.1221 | Ck60 | 080A62 | XC60 | 1060 |
| Spring steel | 1000-1100 | | | 1.1274 | Ck101 | 060A96 | | 1095 |
| High temp. constructional steel | 440-570 | | | 1.5415 | 15Mo3 | 1501-240 | 15D3 | ASTM A20Gr. A |
| High temp. constructional steel | 440-590 | | | 1.7335 | 13CrMo4 4 | 1501-620Gr.27 | 15CD3.5 | ASTM A182 |
| High temp. constructional steel | 440-590 | | | 1.7380 | 10CrMo9 10 | 1501-622 | 12CD9;10 | ASTM A182 |
| High temp. constructional steel | 450-590 | | | 1.5423 | 16Mo5 | 1503-245-420 | | 4520 |
| Tough at sub zero | 490-640 | | | 1.5622 | 14Ni6 | | 16N6 | ASTM A350LF 5 |
| High temp. constructional steel | 490-640 | | | 1.7715 | 14MoV6 3 | 1503-660-440 | | |
| Tough at sub zero | 510-710 | | | 1.5680 | 12Ni19 | | Z18N5 | 2515 |
| Case hardening steel | 640-1080 | | | 1.7131 | 16MnCr5 | (527M20) | 16MC5 | 5115 |
| Case hardening steel | 640-1080 | | | 1.7262 | 15CrMo5 | | 12CD4 | |
| Cold work tool steel | 640-670 | | O1 | | | | | O1 |
| Hot / cold tool steel | 640-720 | | S7 | | | | | S7 |
| Tough at sub zero | 640-840 | | | 1.5662 | X8Ni9 | 1501-509;510 | | ASTM A353 |
| Ball and roller bearing steel | 650-750 | | | 1.3505 | 100Cr6 | 534A99 | 100C6 | 52100 |
| Heat treatable steel | 650-950 | | | 1.7218 | 25CrMo4 | 1717CDS 110 | 25CD4 | 4130 |
| Case hardening steel | 690-1080 | | | 1.6523 | 21NiCrMo2 | 805M20 | 20NCD2 | 8620 |
| Case hardening steel | 690-880 | | | 1.7015 | 15Cr3 | 523M15 | 12C3 | 5015 |
| Heat treatable steel | 690-930 | | | 1.5710 | 36NiCr6 | 640A35 | 35NC6 | 3135 |
| Superficial hardening steel | 700-750 | | | 1.7045 | 42Cr4 | | | 5140 |

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|---|---|---|---|---|---|---|---|---|
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| | | | | W.-Nr. | DIN | BS | AFNOR | AIS/SAE |
| Heat treatable steel | 700-950 | | | 1.7033 | 34Cr4 | 530A32 | 32C4 | 5132 |
| Cold work tool steel | 720-775 | | A6 | | | | | A6 |
| Superficial hardening steel | 740-1080 | | | 1.7223 | 41CrMo4 | 708M40 | 42CD4TS | 4140;4142 |
| Heat treatable steel | 750-1100 | | | 1.7220 | 34CrMo4 | 708A37 | 35CD4 | 4137;4135 |
| Cold work tool steel | 750-775 | | O7 | | | | | O7 |
| Cold work tool steel | 750-800 | | | 1.2542 | 45WSCrV7 | BS1 | | S1 |
| Cold work tool steel | 750-850 | | | 1.2067 | 100Cr6 | BL3 | Y100C6 | L3 |
| Cold work tool steel | 750-850 | | A2 | 1.2363 | X100CrMoV51 | BA2 | Z100CDV5 | A2 |
| Cold work tool steel | 750-850 | | | 1.2419 | 105WCr6 | | 105WC13 | |
| Cold work tool steel | 750-850 | | | 1.2833 | 100V1 | BW2 | Y1105V | W210 |
| High speed steel | 775-990 | | M2 | 1.3343 | S 6-5-2 | BM2 | Z85WDCV 06-05-04-02 | M2 |
| High speed steel | 775-990 | | | 1.3348 | S 2-9-2 | | Z100WCWV 09-04-02-02 | M7 |
| Heat treatable steel | 780-1080 | | | 1.3401 | X120Mn12 | Z120M12 | Z120M12 | |
| Superficial hardening steel | 780-1180 | | | 1.8159 | 50CrV4 | 735A50 | 50CV4 | 6150 |
| High speed steel | 795-870 | | M3 | | | | | M3 |
| Cold work tool steel | 795-910 | | A7 | | | | | A7 |
| High speed steel | 800-1050 | | | 1.3355 | S 18-0-1 | BT1 | Z80WCV 18-04-01 | T1 |
| Heat treatable steel | 800-1100 | | | 1.6511 | 36CrNiMo4 | 816M40 | 40NCD3 | 9840 |
| Heat treatable steel | 800-1100 | | | 1.7035 | 41Cr4 | 530M40 | 42C4 | 5140 |
| Heat treatable steel | 800-1200 | | | 1.7225 | 42CrMo4 | 708M40 | 42CD4 | 4140 |
| Cold work tool steel | 800-850 | | | 1.2713 | 55NiCrMoV6 | | 55NCDV7 | L6 |
| High speed steel | 820-1050 | | | 1.3243 | S 6-5-2-5 | | Z85WDKCV 06-05-05-04-02 | |
| High speed steel | 820-1050 | | | 1.3255 | S 18-1-2-5 | BT4 | Z80WKCV 18-05-04-01 | T4 |
| Case hardening steel | 830-1180 | | | 1.5732 | 14NiCr10 | | 14NC11 | 3415 |
| Cold work tool steel | 850-900 | | D2 | 1.2379 | X155CrVMo12-1 | BD2 | Z160CDV12 | D2 |
| Cold work tool steel | 850-900 | | | 1.2080 | X210Cr12 | BD3 | Z200Cr12 | D3 |
| Cold work tool steel | 850-900 | | | 1.2436 | X210CrW12 | | | |
| Cold work tool steel | 850-900 | | | 1.2601 | X165CrMoV12 | | | |
| Case hardening steel | 880-1230 | | | 1.5752 | 14NiCr14 | 655M13 | 12NC15 | 3415 |
| Heat treatable steel | 900-1200 | Nickelvac 4340 | | 1.6582 | 34CrNiMo6 | 817M40 | 35NCD6 | 4340 |
| Nitriding steel | 950-1000 | | | 1.8509 | 41CrAlMo7 | 905M39 | 40CAD6, 12 | |
| Spring steel | 950-1050 | | | 1.0904 | 55Si7 | 250A53 | 55S7 | 9255 |
| Case hardening steel | 980-1320 | | | 1.6587 | 17CrNiMo6 | 820A16 | 18NCD6 | |
| Heat treatable steel | 980-1420 | | | 1.7361 | 32CrMo12 | 722M24 | 30CD12 | |
| Spring steel | 1050-1100 | | | 1.7176 | 55Cr3 | 527A60 | 55C3 | 5155 |
| Spring steel | 1050-1100 | | | 1.0961 | 60SiCr7 | | 60SC7 | 9262 |
| Nitriding steel | 1080-1270 | | | 1.2606 | 39CrMoV13 9 | BH12 | | H12 |
| Hot work tool steel | 1180-1570 | | | 1.2343 | | BH11 | | H11 |
| Hot work tool steel | 1180-1670 | | | 1.2365 | | BH10 | | H10 |
| Hot work tool steel | 1180-1770 | | H13 | 1.2344 | X40CrMoV51 | BH13 | Z40CDV5 | H13 |
| Hot work tool steel | 1180-1770 | | | 1.2581 | X30WCrV9 3 | BH21 | Z30WCV9 | H21 |
| Hot work tool steel | 1270-1670 | | | 1.2678 | | BH19 | | H19 |

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# Materials Cross Reference Chart

| Material Group | Country/Standard | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Rm (N/mm²) | Allvac Designation | Allegheny Ludlum Designation | GERMANY/ITALY | | U.K. | FRANCE | USA |
| | | | | W.-Nr. | DIN | | AFNOR | AMS |
| Stainless steel | 400-600 | Nickelvac 410 / 403 | AL 403 | 1.4000 | X6Cr13 | 403S17 | Z6C13 | 403 |
| Heat resistant steel casting | 400-600 | | | 1.4865 | G-X40NiCrSi38 18 | 330C11 | | |
| Stainless steel casting | 440-640 | | | 1.4308 | G-X6CrNi18 9 | 304C15 | Z6CN18.10M | |
| Stainless steel casting | 440-640 | | | 1.4408 | G-X6CrNiMo18 10 | 316C16 | | |
| Stainless steel casting | 440-640 | | | 1.4581 | G-X7CrNiMoNb18 10 | 318C17 | Z4CNNDNb18 12M | |
| Heat resistant steel | 450-650 | | AL 405 | 1.4724 | X10CrAl13 | 403S17 | Z10C13 | 405 |
| Stainless steel | 450-650 | Nickelvac 410 / 403 | AL 410 | 1.4006 | X10Cr13 | 410S21 | Z10C14 | 410 |
| Stainless steel | 450-650 | | AL 430 | 1.4016 | X6Cr17 | 430S15 | Z8C17 | 430 |
| Stainless steel | 450-650 | | AL 434 | 1.4113 | X6CrMo17 | 434S17 | Z8CD17.01 | 434 |
| Stainless steel | 460-680 | | AL 304L | 1.4306 | X2CrNi19 11 | 304S12 | Z3CN18.10 | 304L |
| Stainless steel | 490-690 | | AL 305 | 1.4303 | X5CrNi18 12 | | | 305 |
| Stainless steel | 490-690 | Allvac 316 L | AL 316L | 1.4435 | X2CrNiMo18 12 | 316S12 | Z2CND17.13 | 316L |
| Stainless steel | 490-690 | | AL 317L | 1.4438 | X2CrNiMo18 16 | 317S12 | Z2CND19.15 | 317L |
| Stainless steel | 490-740 | | | 1.4583 | X10CrNiMoNb18 12 | | Z6CNDNb17 13B | 318 |
| Stainless steel | 500-550 | | E-Brite Alloy | | | | | ASTM A240 |
| Stainless steel | 500-700 | | AL 303 | 1.4305 | X10CrNiS18 9 | 303S21 | Z10CNF 18.09 | 303 |
| Stainless steel | 500-700 | | AL 304 | 1.4301 | X5CrNi18 10 | 304S15 | Z6CN18.09 | 304 |
| Stainless steel | 500-730 | | AL 321 | 1.4541 | X6CrNiTi18 10 | 2337 | Z6CNT18.10 | 321 |
| Stainless steel | 500-730 | | | 1.4571 | X6CrNiMoTi17 12 2 | 320S17 | Z6NDT17.12 | 316Ti |
| Heat resistant steel | 500-750 | | AL 309 | 1.4828 | X15CrNiSi20 12 | 309S24 | Z15CNS20.12 | 309 |
| Heat resistant steel | 500-750 | | AL 310S | 1.4845 | X12CrNi25 21 | 310S24 | Z12CN25 20 | 310S |
| Stainless steel | 500-750 | | AL 904L | 1.4539 | | | | ASTM B625 |
| Heat resistant steel | 500-750 | | | 1.4878 | X12CrNiTi18 9 | 321S320 | Z6CNT18.12B | |
| Stainless steel | 510-710 | | AL 316 | 1.4401 | X5CrNiMo18 10 | 316S16 | Z6CND17.11 | 316 |
| Stainless steel | 510-740 | | AL 347 | 1.4550 | X6CrNiNb18 10 | 347S17 | Z6CNNb18.10 | 347 |
| Heat resistant steel | 520-720 | | | 1.4762 | X10CrAl 24 | | Z10CAS24 | 446 |
| Stainless steel | 550-760 | | | 1.4311 | X2CrNiN18 10 | 304S62 | Z2CN18.10 | 304LN |
| Heat resistant steel | 550-800 | | | 1.4841 | X15CrNiSi25 20 | | | 310 |
| Heat resistant steel | 550-800 | | | 1.4864 | X12NiCrSi36 16 | | Z12NCS35.16 | 330 |
| Stainless steel | 580-800 | | AL 316LXN | 1.4429 | X2CrNiMoN17 13 3 | | Z2CND17.13 | 316LN |
| Stainless steel | 590-780 | | AL 416 | 1.4005 | X12CrS13 | | | 416 |
| Stainless steel | 640-840 | | | 1.4104 | X12CrMoS17 | | Z10CF17 | 430F |
| Stainless steel | 640-900 | | | 1.4460 | X8CrNiMo27 5 | | | 329 |
| Stainless steel | 700-800 | | | 1.4034 | X45Cr13 | 420S45 | Z40CM Z38C13M | |
| Stainless steel | 700-950 | | AL 301 | 1.4310 | X12CrNi17 7 | | Z12CN17.07 | 301 |
| Stainless steel | 750-800 | | | 1.4027 | G-X20Cr14 | 420C29 | Z20C13M | |
| Stainless steel | 750-950 | | AL 420 | 1.4021 | X20Cr13 | | | 420 |
| Stainless steel casting | 760-960 | | | 1.4313 | X5CrNi13 4 | 425C11 | Z4CND13.4M | |
| Stainless steel | 800-900 | | AL 2205 | | | | | ASTM A240 |
| Stainless steel | 850-950 | | | 1.4057 | X20CrNi172 | 431S29 | Z15CNi6.02 | 431 |
| Stainless steel | 1100-1200 | | AM 350 | | | | | ASTM A693 |
| Precipitation hardening stainless | | | AL 13-8 | | | | | 13-8 PH |
| Precipitation hardening stainless | | Nickelvac 15-5 PH | AL 15-5 | 1.4540 | X4CrNiCuNb164 | | Z6CNU15.05 | 15-5 PH |
| Precipitation hardening stainless | | | AL 15-7 | 1.4532 | X7CrNiMoAl157 | | Z8CNDA15.07 | 15-7 PH |
| Precipitation hardening stainless | | Nickelvac 17-4 PH | AL 17-4 | 1.4542 | X5CrNiCuNb174 | | Z6CNU17.04 | 17-4 PH |
| Precipitation hardening stainless | | | AL 17-7 | 1.4568 | X7CrNiAl177 | | Z8CNA17.07 | 17-7 PH |

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# Materials Cross Reference Chart

| Cr | Ni | C | Mn | Si | P | S | Mo | Cu | Ti | Others |
|---|---|---|---|---|---|---|---|---|---|---|
| 12.0 | | 0.15 | 0.5 | 0.50 | 0.02 | 0.01 | | | | |
| 18.8 | 38.0 | 0.4 | 1.0 | 1.75 | 0.045 | 0.03 | | | | W 4.75 |
| 19.0 | 10.0 | 0.07 | 1.5 | 2.0 | 0.045 | 0.03 | | | | |
| 19.0 | 11.0 | 0.07 | 1.5 | 1.5 | 0.045 | 0.03 | 2.5 | | | |
| 19.0 | 11.5 | 0.06 | 1.5 | 1.5 | 0.045 | 0.03 | 2.25 | | | |
| 12.0 | | 0.08 | 1.0 | 0.50 | 0.04 | 0.03 | | | | Al 0.10-0.30 |
| 12.0 | | 0.15 | 0.5 | 0.50 | 0.02 | 0.01 | 0.5 | 0.5 | | |
| 16.0 | | 0.08 | 1.0 | 1.0 | 0.04 | 0.03 | | | | |
| 17.0 | | 0.08 | | | | | 0.75 | | | |
| 19.0 | 10.0 | 0.015 | 1.0 | 0.5 | 0.023 | 0.015 | | | | |
| 18.0 | 11.5 | 0.12 | 2.0 | 1.0 | 0.04 | 0.03 | | | | |
| 17.0 | 12.0 | 0.015 | 1.0 | 0.5 | 0.023 | 0.015 | 2.5 | | | |
| 19.0 | 13.0 | 0.015 | 1.0 | 1.0 | 0.023 | 0.015 | 3.5 | | | |
| 18.0 | 14.0 | 0.08 | 2.0 | | | | 2.0 | | | |
| 26 | | 0.003 | | | | | 1 | | | |
| 19.5 | 10.5 | 0.16 | 1.5 | 2.0 | 0.04 | 0.3 | 0.6 | | | |
| 19.5 | 9.0 | 0.08 | 1.5 | 2.0 | 0.04 | 0.04 | | | | |
| 18.0 | 9.5 | 0.08 | 2.0 | 1.0 | 0.04 | 0.03 | | | 0.40 | |
| 17.5 | 12.0 | 0.08 | 2.0 | 1.0 | 0.045 | 0.03 | 2.25 | | 5.0 | |
| 23.5 | 14.0 | 0.20 | 1.5 | 2.0 | 0.04 | 0.04 | | | | |
| 25.0 | 20.5 | 0.15 | 2.0 | 0.75 | 0.045 | 0.03 | | | | |
| 20.5 | | | | | | | 4.5 | 1.5 | | |
| 18.0 | 10.5 | 0.12 | 2.0 | 1.0 | 0.045 | 0.03 | | | 0.40 | Al 0.40 |
| 17.0 | 13.0 | 0.08 | 2.0 | 0.75 | 0.04 | 0.03 | 1.5 | 0.50 | | |
| 18.0 | 11.0 | 0.08 | 2.0 | 1.0 | 0.045 | 0.03 | | | | |
| 25.0 | | 0.12 | 1.0 | 1.0 | 0.04 | 0.03 | | | | Al 1.50 |
| 18.0 | 10.0 | 0.03 | 2.0 | 1.0 | 0.045 | 0.03 | | | | N 0.16 |
| 24.5 | 20.5 | 0.18 | 2.0 | 1.5 | 0.04 | 0.03 | 0.5 | 0.5 | | |
| 15.0 | 35.0 | 0.15 | 1.0 | 2.5 | 0.04 | 0.04 | | | | |
| 17.5 | 13.0 | 0.03 | 2.0 | 1.0 | 0.045 | 0.025 | 2.75 | | | N 0.16 |
| 13.0 | | 0.15 | 1.25 | 1.0 | 0.07 | 0.07 | 0.60 | | | |
| 17.0 | | 0.12 | 1.25 | 1.0 | 0.06 | 0.15 | 0.5 | | | |
| 25.5 | 3.5 | 0.1 | | | 0.04 | 0.03 | 1.0 | | | |
| 13.5 | | 0.5 | 1.0 | 1.0 | 0.045 | 0.03 | | | | |
| 17.0 | 7.0 | 0.14 | 2.0 | 1.0 | 0.045 | 0.03 | | | | |
| 13.5 | 1.0 | 0.2 | 1.0 | 1.0 | 0.045 | 0.03 | | | | |
| 12.5 | | 0.20 | 1.0 | 1.0 | 0.04 | 0.04 | | | | |
| 13.0 | 4.5 | 0.07 | 1.5 | 1.0 | 0.035 | 0.025 | 0.7 | | | |
| 22 | 5.5 | | | | | | 3 | | | N 0.16 |
| 16.0 | 2.0 | 0.20 | 1.0 | 1.0 | 0.04 | 0.03 | | | | |
| 16.5 | 4.3 | 0.08 | | | | | 2.8 | | | |
| 13 | 8 | | | | | | 2.2 | | | Al 1.2 |
| 14.8 | 4.5 | 0.03 | 0.5 | 0.5 | 0.02 | 0.015 | | 3.5 | | Cb 0.3 |
| 15.0 | 7.0 | 0.045 | 0.5 | 0.5 | 0.02 | 0.015 | 2.5 | | | Al 1.15 |
| 16.3 | 4.0 | 0.035 | 0.5 | 0.5 | 0.02 | 0.015 | | 4.0 | | Cb 0.3 |
| 17.0 | 7.0 | 0.045 | 0.5 | 0.5 | 0.02 | 0.02 | | | | Al 1.15 |

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# Materials Cross Reference Chart

| Material Group | Country/Standard | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | HBN | Allvac Designation | Allegheny Ludlum Designation | GERMANY/ITALY | | U.K. | FRANCE | USA |
| | | | | W.-Nr. | DIN | BS | AFNOR | ASTM/SAE |
| Grey cast iron | 175 | | | 0.6010 | GG 10 | Grade 100 | Ft 10 D | No 20 B |
| Grey cast iron | 185 | | | 0.6015 | GG 15 | Grade 150 | Ft 15 D | No 25 B |
| Grey cast iron | 205 | | | 0.6020 | GG 20 | Grade 220 | Ft 20 D | No 30 B |
| Grey cast iron | 220 | | | 0.6025 | GG 25 | Grade 260 | Ft 25 D | No 35 B |
| Grey cast iron | 230 | | | 0.6030 | GG 30 | Grade 300 | R 30 D | No 45 B |
| Grey cast iron | 235 | | | 0.6035 | GG 35 | Grade 350 | Ft 35 D | No 50 B |
| Grey cast iron | 250 | | | 0.6040 | GG 40 | Grade 400 | Ft 40 D | No 55 B |
| Spheroidal / nodular/ ductile cast iron | 150-180 | | | | GGG 35.3 | 350/22 | FGS 350-22 | 60-40-18 |
| Spheroidal / nodular/ ductile cast iron | 155-220 | | | 0717-02 | GGG 40 | 420/12 | | 65-45-12 |
| Spheroidal / nodular/ ductile cast iron | 190-255 | | | 0727-02 | GGG 50 | 500/7 | FGS 500-7 | 80-55-06 |
| Spheroidal / nodular/ ductile cast iron | 200-260 | | | 0732-03 | GGG 60 | 600/3 | FGS 600-3 | 80-60-03 |
| Spheroidal / nodular/ ductile cast iron | 240-300 | | | 0737-01 | GGG 70 | 700/2 | FGS 700-2 | 100-70-03 |
| Spheroidal / nodular/ ductile cast iron | 265-300 | | | | GGG 80 | 900/2 | FGS 900-2 | 120-90-02 |
| Malleable cast iron | 150 | | | | GTS-35-10 | B 340/12 | MN 35-1 | 32510 |
| Malleable cast iron | 175 | | | 0.8145 | GTS-45-06 | P 440/7 | | 40010 |
| Malleable cast iron | 205 | | | 0.8155 | GTS-55-04 | P 510/4 | MP 50-5 | 50005 |
| Malleable cast iron | 230 | | | 0.8165 | GTS-65-02 | P 570/3 | Mn 650-3 | A220-70003 |
| Malleable cast iron | 265 | | | 0.8170 | GTS-70-02 | P 690/2 | Mn 700-2 | A220-80002 |
| Aluminium alloys | | | | 3.0255 | Al99,9 | 1B | A5 | 1050 |
| Aluminium alloys | | | | 3.0515 | AlMn | N3 | | |
| Aluminium alloys | | | | 3.0615 | AlMgSiPb | | | |
| Aluminium alloys | | | | 3.1325 | AlCuMg1 | | A-U4G | 2017 |
| Aluminium alloys | | | | 3.1355 | AlCuMg2 | L97 | A-U4G1 | 2024 |
| Aluminium alloys | | | | 3.1645 | AlCuMgPb | | | |
| Aluminium alloys | | | | 3.1655 | AlCuBiPb | FC1 | A-U5PbBi | 2011 |
| Aluminium alloys | | | | 3.2245 | AlSi5 | | | |
| Aluminium alloys | | | | 3.2305 | AlRMgSi | | | |
| Aluminium alloys | | | | 3.2315 | AlMgSi1 | H30 | | 6351 |
| Aluminium alloys | | | | 3.3206 | AlMgSi0,5 | H9 | | 6063 |
| Aluminium alloys | | | | 3.3309 | AlRMg0,5 | | | |
| Aluminium alloys | | | | 3.3315 | AlMg1 | N41 | A-G0,6 | 5005 |
| Aluminium alloys | | | | 3.3316 | AlMg1,5 | 3L44 | A-G1,5 | 5050 |
| Aluminium alloys | | | | 3.3319 | AlRMg1 | | | |
| Aluminium alloys | | | | 3.3523 | AlMg2,5 | 2L56 | A-G2,5C | 5052 |
| Aluminium alloys | | | | 3.3535 | AlMg3 | N5 | A-G3M | 5754 |
| Aluminium alloys | | | | 3.3545 | AlMg4Mn | | A-G4MC | 5086 |
| Aluminium alloys | | | | 3.3547 | AlSlMg4,5Mn | N8 | A-G4,5MC | 5083 |
| Aluminium alloys | | | | 3.3549 | AlMg5 | N6 | | 5056 |
| Aluminium alloys | | | | 3.4365 | AlZnMgCu1,5 | DTD5074 | A-Z5GU | 7075 |
| Aluminium alloys | | | | | AlZnMg1 | | | 7005 |
| Aluminium alloys | | | | | AlMg2,5Mn | N51 | A-G2,5MC | 5454 |
| Aluminium alloys | | | | | AlSi3,5 | | | |

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

| Si | Fe | Cu | Mn | Mg | Cr | Zn | Ti | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
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| | | | | | | | | | | |
| 0.25 | 0.4 | 0.05 | 0.05 | 0.05 | | 0.07 | 0.05 | | | |
| 0.5 | 0.7 | 0.1 | 1.2 | 0.3 | 0.1 | 0.2 | 0.1 | | | |
| 1.0 | 0.5 | 0.1 | 0.7 | 0.9 | 0.3 | 0.3 | 0.2 | | | |
| 0.5 | 0.7 | 4.0 | 0.7 | 0.7 | 0.1 | 0.25 | | | | |
| 0.5 | 0.5 | 4.3 | 0.6 | 1.5 | 0.1 | 0.25 | 0.15 | | | |
| 0.8 | 0.8 | 4.0 | 0.75 | 1.1 | 0.1 | 0.8 | 0.2 | | | |
| 0.4 | 0.7 | 5.5 | | | | 0.3 | | | | |
| 5.0 | 0.4 | 0.05 | 0.1 | 0.1 | | 0.2 | 0.25 | | | |
| 0.55 | 0.15 | 0.02 | | 0.45 | | 0.15 | | | | |
| 1.0 | 0.5 | 0.1 | 0.6 | 0.9 | 0.25 | 0.2 | 0.1 | | | |
| 0.45 | 0.15 | 0.1 | 0.1 | 0.45 | 0.05 | 0.15 | 0.1 | | | |
| 0.01 | 0.008 | | | 0.35 | | 0.01 | 0.008 | | | |
| 0.3 | 0.45 | 0.05 | 0.15 | 0.9 | 0.1 | 0.2 | | | | |
| 0.4 | 0.45 | 0.05 | 0.15 | 1.5 | 0.1 | 0.2 | | | | |
| 0.1 | 0.008 | | | 1.00 | | 0.01 | 0.008 | | | |
| 0.25 | 0.4 | 0.1 | 0.1 | 2.5 | 0.2 | 0.1 | | | | |
| 0.4 | 0.4 | 0.1 | 0.5 | 3.1 | 0.3 | 0.2 | 0.15 | | | |
| 0.4 | 0.5 | 0.1 | 0.45 | 4.0 | 0.15 | 0.25 | 0.15 | | | |
| 0.4 | 0.4 | 0.1 | 0.7 | 4.5 | 0.15 | 0.25 | 0.15 | | | |
| 0.2 | 0.35 | 0.15 | 0.35 | 4.5 | 0.1 | 0.25 | 0.1 | | | |
| 0.4 | 0.5 | 1.6 | 0.3 | 2.5 | 0.23 | 5.5 | 0.2 | | | |
| 0.35 | 0.4 | 0.1 | 0.45 | 1.4 | 0.13 | 4.5 | 0.03 | | | |
| 0.4 | 0.4 | 0.05 | 0.75 | 2.7 | 0.1 | 0.1 | 0.15 | | | |
| 4.5 | | | | 0.04 | | | | | | |

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
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| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# Materials Cross Reference Chart

| Material Group | Country/Standard | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Commercial Designation | Allvac Designation | Allegheny Ludlum Designation | GERMANY/ITALY | | U.K. | FRANCE | USA |
| | | | | W.-Nr. | DIN | | AFNOR | AMS |
| Iron based alloys | VascoMax C-250 | VascoMax C-250 | | | | | | 6501, 6512, 6520 |
| Iron based alloys | VascoMax C-350 | VascoMax C-350 | | | | | | |
| Iron based alloys | VascoMax C-200 | VascoMax C-200 | | | | | | |
| Iron based alloys | VascoMax C-300 | VascoMax C-300 | | | | | | 6514 |
| Iron based alloys | VascoMax T-200 | VascoMax T-200 | | | | | | |
| Iron based alloys | VascoMax T-250 | VascoMax T-250 | | | | | | 6518, 6519, 6591 |
| Iron based alloys | Greek Ascoloy | | AL 418 | | | | | 5508 |
| Iron based alloys | Jethete M-152 | | | | | | Z12 CND 12 | 5718, 5719 |
| Iron based alloys | Haynes 556 | | | | X12CrCoNi2120 | | | 5768 |
| Iron based alloys | N 155 | | | | | | Z12 CNKDW 20 | 5768 |
| Iron based alloys | S 590 | | | | X40CoCrNi2020 | | Z42 CKNDW | 5533 |
| Iron based alloys | Crucible A286 | | ALTEMP A 286 | 1.4980 | | HR 5152 | Z06 NCT 25 | ASTM 368 |
| Iron based alloys | Discaloy 16/25/6 | | | | | | Z3 NCT 25 | 5725 |
| Iron based alloys | AL-6XN Alloy | | AL-6XN Alloy | | | | | ASTM SB688 |
| Iron based alloys | Discaloy 24 | | | | | | Z3 NCT 25 | ASTM A638 |
| Iron based alloys | Armco 18 | | | | | | | |
| Iron based alloys | Incoloy 801 | | | | G-X50CrNi3030 | | | 5552 |
| Iron based alloys | Incoloy 800 | Nickelvac 800 | AL 800 | | X10NiCrAlTi3220 | 3082-76 | 25 NC 3520 | ASME SB 409 |
| Iron based alloys | Incoloy 802 | | | | | | | |
| Iron based alloys | N 156 | | | | | | | |
| Iron based alloys | 20CB-3 | | AL 20 | | | | | ASTM B463 |
| Iron based alloys | Sanicro 30 | | | | X2NiCrAlTi3220 | | | |
| Iron based alloys | Incoloy 803 | | | | | | | |
| Iron based alloys | Allvac 330 | Allvac 330 | | | | | | 5592, 5716 |
| Iron based alloys | AL 36 | | AL 36 | | | | | ASTM F1684 |
| Iron based alloys | Incoloy DS | | | | X12NiCrSi3616 | 3072-76 | | |
| Iron based alloys | AL 42 | | AL 42 | | | | | ASTM F30 |
| Iron based alloys | Armco 20-45-5 | | | | | | | |
| Iron based alloys | AL 4750 | | AL 4750 | | | | | ASTM B753 |
| Iron based alloys | ALLOY 21-6-9 | | ALLOY 21-6-9 | | | | | ASTM A666 |
| Iron based alloys | Vasco 13-8 Mo | Vasco 13-8 Mo | | | | | | 5629 |

| Material Group | Country/Standard | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Commercial Designation | Allvac Designation | Allegheny Ludlum Designation | GERMANY/ITALY | | U.K. | FRANCE | USA |
| | | | | W.-Nr. | DIN | | AFNOR | AMS |
| Cobalt based alloys | MP35N | Allvac 35N | | | | | | |
| Cobalt based alloys | L 605 | Nickelvac L-605 | | | CoCr20W15Ni | | KC 20 WN | 5759 |
| Cobalt based alloys | Nickelvac TJA- 1537 | Nickelvac TJA- 1537 | | | | | | ASTM F1537 |
| Cobalt based alloys | Altemp S 816 | | | | CoCr20Ni20W | | | 5534 |
| Cobalt based alloys | HS 21 | | | | CoCr28Mo | 3531 | | ASTM F-75 |
| Cobalt based alloys | HS 25 | | | | CoCr20W15Ni | | KC 20 WN | AISI 670 |
| Cobalt based alloys | HS 30 | | | | CoCr26Ni14Mo | | | |
| Cobalt based alloys | HS 31 | | | | CoCr25NiW | 3146 | KC 25 NW | ASTM A567 |
| Cobalt based alloys | HS 36 | | | | CoCr19W14NiB | | | |
| Cobalt based alloys | Jetalloy 209 | | | | | | | |
| Cobalt based alloys | L 251 | | | | | | | |
| Cobalt based alloys | M 203 | | | | | | | |

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
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| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# Materials Cross Reference Chart

| Ni | Co | Cr | Mo | W | Si | Mn | C | Al | Ti | P | S | Others |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18.5 | 7.8 | | 4.8 | | 0.05 | 0.05 | 0.02 | 0.1 | 0.4 | 0.005 | 0.005 | |
| 18.5 | 12.0 | | 4.8 | | 0.05 | 0.05 | 0.02 | 0.1 | 1.4 | 0.005 | 0.005 | |
| 18.5 | 8.5 | | 3.25 | | 0.05 | 0.05 | 0.01 | | 0.2 | 0.005 | 0.005 | |
| 18.5 | 8.8 | | 4.8 | | 0.05 | 0.05 | 0.02 | 0.1 | 0.73 | 0.005 | 0.005 | |
| 18.5 | | | 3.0 | | 0.05 | 0.05 | 0.01 | | 0.7 | 0.005 | 0.005 | |
| 18.5 | | | 3.0 | | 0.03 | 0.05 | 0.02 | 0.1 | 1.4 | 0.005 | 0.005 | |
| 2 | | 12 | | 2.5 | | | 0.19 | | | | | |
| 2.5 | | 12 | 1.7 | | | | 0.15 | | | | | V0.3 |
| 20 | 20 | 21 | 3 | 2.5 | | | 0.1 | | | | | Nb + Ta |
| 20 | 20 | 21 | 3 | 2.5 | 0.5 | 1.5 | 0.15 | | | | | Nb 1.0 |
| 20 | 20 | 21 | 4 | 4 | | | 0.43 | | | | | |
| 25 | | 14 | 1.3 | | 0.5 | 1.3 | 0.05 | 0.2 | 2.1 | | | |
| 25 | | 16 | 6 | | 0.7 | 1.35 | 0.12 | | 0.3 | | | Nb 0.4 |
| 25 | | 20.5 | 6.5 | | | | 0.02 | | | | | N 0.2 |
| 26 | | 13.5 | 2.7 | | 0.8 | 0.9 | 0.04 | 0.1 | 1.7 | | | |
| 3.7 | | 17.2 | | | 0.47 | 12.5 | 0.06 | | | | | |
| 32 | | 20.5 | | | 0.5 | 0.8 | 0.05 | | 1.1 | | | |
| 32.5 | | 21.0 | | | 0.5 | 0.75 | 0.05 | 0.37 | 0.37 | | 0.007 | Cu 0.37 |
| 32.5 | | 21.5 | | | 0.4 | 0.8 | 0.4 | | | | | |
| 33 | 24 | 17 | 3 | 2 | | | 0.33 | | | | | |
| 33 | | 20 | 2.2 | | | | | | | | | Cu 3.3 |
| 34 | | 22 | | | 0.55 | 0.55 | 0.03 | 0.3 | 0.5 | | | Cu 0.1 |
| 35 | | 25 | | | | | 0.08 | 0.15 | 0.15 | | | |
| 35.5 | | 18.5 | | | 1.13 | 1.0 | 0.04 | | | 0.01 | 0.01 | Cu 0.5 |
| 36 | | | | | | | | | | | | |
| 37 | | 18 | | | 2.3 | 1.0 | 0.06 | | | | | |
| 41 | | | | | | | | | | | | |
| 46 | | 20 | 2.3 | | 1.0 | 5 | 0.08 | | | | | Nb 0.4 |
| 49 | | | | | | | | | | | | |
| 6.5 | | 21 | | | | 6.0 | | | | | | No 0.3 |
| 8.0 | | 12.8 | 2.3 | | 0.05 | 0.10 | 0.03 | 1.05 | | 0.005 | 0.004 | |

| Ni | Fe | Cr | Mo | W | Si | Mn | C | Al | Ti | P | S | Others |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 35 | | 20 | 9.8 | | | | 0.013 | | | | | |
| 10 | 0.5 | 20 | | 15 | | 1.7 | 0.1 | | | | | |
| 0.2 | 0.25 | 28 | 6 | | 0.5 | 0.5 | 0.06 | | | | | N 0.2 |
| 20 | 4 | 20 | 4 | 4 | 0.4 | 1.2 | | | 0.38 | | | |
| 3 | 1 | 27 | 5 | | 0.6 | 0.6 | | | 0.25 | | | |
| 10 | 3 | 20 | | 15 | 2 | 1.5 | | | 0.1 | | | |
| 16 | 1 | 24 | 6 | | 0.6 | 0.6 | | | 0.4 | | | |
| 10 | 1.5 | 25 | | 8 | 0.75 | 0.6 | | | 0.4 | | | |
| 10 | 2 | 18 | | 15 | | 1.5 | | | 0.4 | | | |
| 10 | 1 | 20 | | 15 | | | | 2.0 | 0.02 | | | |
| 10 | 1 | 19 | | 14 | | | | | 0.4 | | | |
| 24.5 | 1 | 19.5 | | 12 | 1 | 0.8 | 2.15 | 24.5 | 0.07 | | | |

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# Materials Cross Reference Chart

| Material Group | Country/Standard | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Commercial Designation | Allvac Designation | Allegheny Ludlum Designation | GERMANY/ITALY | | U.K. | FRANCE | USA |
| | | | | W.-Nr. | DIN | | AFNOR | AMS |
| Cobalt based alloys | M 204 | | | | | | | |
| Cobalt based alloys | M 205 | | | | | | | |
| Cobalt based alloys | MAR-M 302 | | | | CoCrW10TaZrB | | | |
| Cobalt based alloys | MAR-M 322 | | | | CoCr22W9TaZrNb | | | |
| Cobalt based alloys | MAR-M 509 | | | | CoCr24Ni10WtaZrB | 3146-3 | | |
| Cobalt based alloys | MAR-M 905 | | | | | | | |
| Cobalt based alloys | MAR-M 918 | | | | CoCr20Ni20Ta | | | |
| Cobalt based alloys | Stellite 1 | | | | | | KC 33 W13 | |
| Cobalt based alloys | Stellite 6 | | | | | | KC 26 NW | |
| Cobalt based alloys | Stellite 12 | | | | | | KC 28 W8 | |
| Cobalt based alloys | V-36 | | | | CoCr25Ni20M0WNb | | | |
| Cobalt based alloys | WI-52 | | | | CoCr21Mo11W | | | |
| Cobalt based alloys | X 40 | | | | CoCr25NiW | 3146-2 | | ASTM A567 |
| Cobalt based alloys | X 45 | | | | | | | |
| Cobalt based alloys | X 50 | | | | | | | |

| Material Group | Country/Standard | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Commercial Designation | Allvac Designation | Allegheny Ludlum Designation | GERMANY/ITALY | | U.K. | FRANCE | USA |
| | | | | W.-Nr. | DIN | | AFNOR | AMS |
| Nickel based alloys | AL 22 | | AL 22 | | | | | ASME SB575 |
| Nickel based alloys | Allcor | Allvac Allcorr | | | | | | |
| Nickel based alloys | Astroloy | Allvac Astroloy | | | | | | |
| Nickel based alloys | Duranickel 310 | | | | | | | |
| Nickel based alloys | GMR 235 | | | | | | | AISI:686 |
| Nickel based alloys | GMR 235-D | | | | NiCr16MoAl | | | |
| Nickel based alloys | Hastelloy B | Nickelvac H-B | | | S-NiMo30 | | ND27FeV | 5396A |
| Nickel based alloys | Hastelloy B-2 | Nickelvac H-B-2 | | | | | | |
| Nickel based alloys | Hastelloy C | | | | NiCr17Mo17FeW | | NC17DWY | 5388C |
| Nickel based alloys | Hastelloy D | | | | | | | |
| Nickel based alloys | Hastelloy N | Nickelvac H-N | | | | | | |
| Nickel based alloys | Hastelloy R235 | | | | | | | |
| Nickel based alloys | Hastelloy W | Nickelvac H-W | | | | | | |
| Nickel based alloys | Hastelloy X | Nickelvac H-X | ALTEMP HX | 2.4665 | NiCr22FeMo | HR6,204 | NC22FeD | 5536 |
| Nickel based alloys | Haynes 75 | | | | | | | |
| Nickel based alloys | HS 27 | | | | NiCo32Cr26Mo | | KC20WN | |
| Nickel based alloys | IN 100 | | | | NiCo15Cr10MoAlTi | | NK15CAT | 5397 |
| Nickel based alloys | IN 713 | | | | | | | |
| Nickel based alloys | Incoloy 020 | | | 2.4660 | | | | ASME SB463 |
| Nickel based alloys | Incoloy 804 | | | | | | | |
| Nickel based alloys | Incoloy 825 | Nickelvac 825 | AL 825 | 2.4858 | NiCr21Mo | 3072-76 | NC21FeDU | ASME SB424 |
| Nickel based alloys | Incoloy 901 | | | | NiFe35Cr14MoTi | | Z8NCDT42 | 5660 |
| Nickel based alloys | Incoloy 903 | | | | | | | |
| Nickel based alloys | Incoloy 925 | | | | | | | |
| Nickel based alloys | Inconel 600 | Nickelvac 600 | AL 600 | 2.4816 | NiCr15Fe | 3072-76 | NC15Fe | 5540 |
| Nickel based alloys | Inconel 601 | Nickelvac 601 | AL 601 | 2.4851 | | | | 5715 |
| Nickel based alloys | Inconel 617 | Nickelvac 617 | | 2.4663 | | | | |
| Nickel based alloys | Inconel 622 | | | 2.4602 | | | | |
| Nickel based alloys | Inconel 625 | Nickelvac 625 | ALTEMP 625 | 2.4856 | NiCr22Mo9Nb | | NC22FeDNB | ASME SB443 |

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

| Ni | Fe | Cr | Mo | W | Si | Mn | C | Al | Ti | P | S | Others |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24.5 | | 18.5 | | 12 | 1 | 1 | | | 0.07 | | | |
| 24.5 | | 18.5 | | 12 | | | 2.75 | | 0.07 | | | |
| | | 21.5 | | 10 | | | | | 0.85 | | | Ta 9.0 |
| | | 21.5 | | 9 | 0.1 | 0.1 | | 0.75 | 1.0 | | | Ta 4.5, Zr 2.25 |
| 10 | 1 | 23.5 | | 7 | 0.1 | 0.1 | | 0.2 | 0.6 | | | Ta 3.5, Zr 0.5 |
| 20 | | 20 | | | | | | 0.5 | 0.05 | | | Ta 7.5, Zr 0.1 |
| 20 | 0.4 | 20 | | | 0.1 | 0.1 | | | 0.05 | | | Ta 7.5, Zr 0.1 |
| | | 33 | | 13 | | | 2.5 | | | | | |
| | | 26 | | 5 | | | 1.0 | | | | | Nb 6.0 |
| | | 29 | | 9 | | | 1.8 | | | | | |
| 20 | 3 | 25 | 4 | 2 | 0.4 | 1 | | | 0.26 | | | Nb 2.0 |
| 1 | 2 | 21 | | 11 | 0.25 | | | | 0.45 | | | Nb 2.0 |
| 10.5 | 1.5 | 25.5 | | 7.5 | 0.75 | 0.75 | | | 0.5 | | | |
| 10.5 | 2 | 25.5 | | 7 | | 0.7 | | | 0.25 | | | B 0.01 |
| 20.5 | 4 | 22.5 | | 12 | | | | | 0.75 | | | |

| Fe | Co | Cr | Mo | W | Si | Mn | C | Al | Ti | P | S | Others |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.5 | | 20.6 | 13.9 | 2.65 | | | | | | | | |
| | | 31.0 | 10.0 | 2.0 | | | 0.02 | 0.25 | 0.25 | | | Nb 0.4 |
| | 17.0 | 15.0 | 5.0 | | | | 0.04 | 4.0 | 3.5 | | | B 0.025 |
| 0.6 | | | 0.5 | | 1.0 | 0.5 | | 4.4 | 0.6 | | | |
| 10.0 | | 15.5 | 5.2 | | 0.4 | 0.2 | 0.15 | 3.0 | 2.0 | | | |
| 4.5 | | 15.5 | 5.0 | | | | 0.15 | 3.5 | 2.5 | | | B0.05 |
| 5.0 | 2.0 | 1.5 | 28.0 | | 0.05 | 0.5 | 0.02 | | | | | V 0.4 |
| 1.0 | 0.5 | 0.5 | 16.0 | | 0.05 | 0.5 | 0.01 | | | 0.02 | 0.015 | |
| 6.0 | 2.0 | 15.0 | 17.0 | 5 | | | 0.04 | | | | | |
| 2.0 | | 1.0 | | | 9.0 | 1.0 | 0.1 | | | | | Cu 3.0 |
| 4.0 | | 7.0 | 16.5 | | | | 0.02 | | | | | |
| 10.0 | 2.5 | 15.5 | 5.5 | | | | 0.15 | 2 | 2.5 | | | |
| 4.0 | | 5.0 | 24.5 | | | | 0.02 | | | | | |
| 18 | 1.5 | 22 | 9.0 | 0.6 | | | 0.1 | | | | | |
| 5.0 | | 20.0 | | | | | 0.12 | 0.25 | 0.4 | | | Cu 0.5 |
| 2.0 | 31.5 | 26.0 | 6.0 | | | | 0.4 | | | | | |
| | 15.0 | 10.0 | 3.0 | | | | 0.18 | 5.5 | 4.7 | | | V 1.0 |
| 2.5 | | 13.0 | 4.6 | | 0.4 | 0.2 | 0.18 | 6.0 | 0.8 | | | Nb 2.6 |
| 37 | | 20 | 2.5 | | | | | | | | | Nb 0.6 Cu 3.5 |
| 25.4 | | 29.5 | | | 0.5 | 0.75 | 0.06 | 0.25 | 0.6 | | | Cu 0.4 |
| 30 | | 21.5 | | 3.0 | 0.5 | 0.65 | 0.03 | 0.2 | 0.9 | | | Cu 2.25 |
| 35.3 | | 13.45 | 6.20 | | 0.22 | 0.48 | 0.05 | | 2.5 | | | |
| 42.0 | 15.0 | | | | | | | 0.7 | 1.4 | | | Nb3.0 |
| 28 | | 21 | 3 | | | | | 0.3 | 2.1 | | | Cu 1.8 |
| 8.0 | | 15.5 | | | | | 0.075 | | | | | |
| 14.0 | | 23.0 | | | 0.2 | 0.5 | 0.05 | 1.3 | | | 0.008 | Cu 0.5 |
| | 12.5 | 22 | 9.0 | | | | 0.07 | 1.0 | | | | |
| 2.3 | | 20.5 | 14.2 | 3.2 | | | | | | | | |
| 2.5 | | 21.5 | 9.0 | | | | 0.05 | 0.3 | 0.3 | | | Cb 3.7 |

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# Materials Cross Reference Chart

| Material Group | Country/Standard | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Commercial Designation | Allvac Designation | Allegheny Ludlum Designation | GERMANY/ITALY | | U.K. | FRANCE | USA |
| | | | | W.-Nr. | DIN | | AFNOR | AMS |
| Nickel based alloys | Inconel 690 | Nickelvac 690 | | 2.4642 | | | | |
| Nickel based alloys | Inconel 700 | | | | NiCo28Cr15MoAlTi | | NK27CADT | |
| Nickel based alloys | Inconel 702 | | | | | | | 5550 |
| Nickel based alloys | Inconel 706 | Allvac 706 | | | | | | 57-2 |
| Nickel based alloys | Inconel 713 | | | | G-NiCr13Al16MoNb | 3146.3 | NC13AD | 5391 |
| Nickel based alloys | Inconel 718 | Allvac 718 | ALTEMP 718 | 2.4668 | NiCr19Fe19NbMo | HR8 | NC19FeNb | 5383 |
| Nickel based alloys | Inconel 718-OP | Allvac 718-OP | | | | | | |
| Nickel based alloys | Inconel 720 | Allvac 720 | | | | | | |
| Nickel based alloys | Inconel 721 | | | | | | | |
| Nickel based alloys | Inconel 722 | Nickelvac W-722 | | | NiCr16FeTi | | NC16Feti | 5541 |
| Nickel based alloys | Inconel 725 | | | | | | | |
| Nickel based alloys | Inconel 751 | Nickelvac X-751 | | 2.4694 | | | | |
| Nickel based alloys | Inconel X-750 | Nickelvac X-750 | ALTEMP 750 | 2.4669 | NiCr16FetTi | | NC15FeTNb | 5542 |
| Nickel based alloys | Jessop G 81 | | | | NiCr20Co18Ti | | | |
| Nickel based alloys | Jethete M-252 | Allvac M-252 | | | G-NiCr19Co | | | 5551 |
| Nickel based alloys | MAR-M 200 | | | | NiW13Co10Cr9AlTi | | NKW10CATaHf | |
| Nickel based alloys | MAR-M 246 | | | | NiCo10W10Cr9AlTi | | | |
| Nickel based alloys | MAR-M 421 | | | | NiCr16Co10WalTi | | | |
| Nickel based alloys | MAR-M 432 | | | | NiCo20Cr16WAlTi | | | |
| Nickel based alloys | Monel 400 | Nickelvac 400 | AL 400 | 2.4360 | NiCu30Fe | 3072-76 | NU30 | 4544 |
| Nickel based alloys | Monel K 500 | Nickelvac K-500 | | 2.4375 | NiCu30Al | 3072-76 | | 4676 |
| Nickel based alloys | Monel R 405 | | | | | | | 4674 |
| Nickel based alloys | Nimocast 713 | | | | G-NiCr13A16MoNb | HC203 | NC13AD | 5391A |
| Nickel based alloys | Nimocast PD 16 | | | | NiFe33Cr17Mo | | | |
| Nickel based alloys | Nimocast PE 10 | | | | | HC202 | NC20N13 | |
| Nickel based alloys | Nimonic 105 | | | 2.4634 | NiCo20Cr15MoAlTi | HR3 | NCKD20ATV | |
| Nickel based alloys | Nimonic 115 | | | 2.4636 | NiCo15Cr15MoAlTi | HR401, 601 | NCVK15ATD | |
| Nickel based alloys | Nimonic 75 | | | 2.4630 | NiCr20Ti | HR5, 203-4 | NC20T | |
| Nickel based alloys | Nimonic 80A | Nickelvac 80 A | | 2.4631 | NiCr20TiAl | HR401, 601 | NC20TA | |
| Nickel based alloys | Nimonic 86 | | | | | | | |
| Nickel based alloys | Nimonic 90 | Nickelvac N-90 | | 2.4632 | NiCr20Co18Ti | HR2,202 | NCK20TA | |
| Nickel based alloys | Nimonic 901 | Nickelvac 901 | | 2.4662 | NiCr15MoTi | | Z8NCDT42 | 5660, 5661 |
| Nickel based alloys | Nimonic 95 | | | | | | | |
| Nickel based alloys | Nimonic C-22 | Nickelvac C-22 | | | | | | |
| Nickel based alloys | Nimonic C-263 | Nickelvac C-263 | ALTEMP 263 | 2.4650 | NiCr20CoMoTi | HR10 | NCK20D | |
| Nickel based alloys | Nimonic C-276 | Nickelvac C-276 | AL 276 | 2.4819 | | | | ASME SB575 |
| Nickel based alloys | Nimonic PE 13 | | | | NiCr22Fe18Mo | HR6,204 | NC22FeD | 5536E |
| Nickel based alloys | Nimonic PE 16 | | | | NiFe33Cr17Mo | HR207 | NW11AC | |
| Nickel based alloys | Nimonic PK 25 | | | | | | NKCD20ATU | 5751A |
| Nickel based alloys | Nimonic PK 31 | | | | | | | |
| Nickel based alloys | Nimonic PK 33 | | | | NiCr20Co16MoTi | 5057 | NC19KDU/V | |
| Nickel based alloys | R-235 | | | | | | | |
| Nickel based alloys | Refractaloy 26 | | | | | | Z6NKCDT38 | AISI:690 |
| Nickel based alloys | René 100 | | | | NiCo15Cr10MoAlTi | | | |
| Nickel based alloys | René 125 | | | | | | | |
| Nickel based alloys | René 41 | Rene 41 | | | NiCr19Co11MoTi | NC19KDT | | 5712, 5713 |
| Nickel based alloys | René 63 | | | | | | | |

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

| Fe | Co | Cr | Mo | W | Si | Mn | C | Al | Ti | P | S | Others |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.0 | | 29.0 | | | 0.2 | 0.2 | 0.25 | | | | 0.007 | Cu 0.2 |
| 0.7 | 28.5 | 15 | 3.7 | | 0.3 | 0.1 | 0.12 | 3.0 | 2.2 | | | |
| 0.4 | | 15.6 | | | 0.2 | 0.05 | 0.04 | 3.4 | 0.7 | | | |
| | | 16.0 | | | | | 0.03 | | 1.8 | | | Cb 2.9 |
| | | 12 | 4.5 | | | | 0.13 | 6 | 0.6 | | | |
| 17.2 | | 19.0 | 3.1 | | | | 0.02 | 0.5 | 0.9 | | | Cb 5.2 |
| 17.2 | | 19.0 | 3.1 | | | | 0.02 | 0.5 | 0.9 | | | Cb 5.2 |
| | 14.7 | 18 | 3 | 1.25 | | | | 2.5 | 5 | | | |
| 8.0 | | 16 | | | 0.15 | 2.25 | 0.07 | 0.1 | 3.0 | | | Cu0.2 |
| 7.0 | | 15.5 | | | | | 0.04 | 0.7 | 2.4 | | | |
| 7.5 | | 21 | 8 | | | | | 0.3 | 1.5 | | | Nb 3.5 |
| 7.0 | | 15.5 | | | 0.2 | 0.5 | 0.05 | 1.2 | 2.3 | | 0.005 | Cb 1.1, Cu 0.2 |
| 7.0 | | 15.5 | | | | | 0.04 | 0.7 | 2.5 | | | Cb 0.95 |
| 0.5 | 16.9 | 20.6 | | | 0.2 | 0.5 | 0.08 | 1.5 | 2.5 | | | |
| 2.5 | 10.0 | 19.0 | 9.75 | | | | 0.15 | 1.0 | 2.5 | | | B 0.007 |
| | 10.0 | 9.0 | | 12.5 | | | 0.15 | 5.0 | 2.0 | | | Nb1.0 |
| | 10.0 | 9.0 | 2.5 | 10.0 | | | 0.15 | 5.5 | 1.5 | | | Ta1.5 |
| | 10.0 | 15.5 | 1.7 | 3.5 | | | 0.15 | 4.25 | 1.75 | | | Nb1.75 |
| | 20.0 | 15.5 | | 3 | | | 0.15 | 2.5 | 4.3 | | | Nb2.0 |
| 1.2 | | | | | 0.25 | | 0.15 | | | | 0.01 | |
| 1.0 | | | | | 0.25 | 0.7 | 0.1 | 2.7 | 0.6 | | 0.01 | |
| 1.25 | | | | | 0.25 | 1.0 | 0.15 | | | | | Cu31.5 |
| | | 13.5 | 4.5 | | | | 0.12 | 6.0 | 0.9 | | | |
| 34.0 | | 16.5 | 3.3 | | | | 0.06 | 1.2 | 1.2 | | | |
| 3.0 | | 20.0 | 6.0 | 2.5 | | | 0.03 | | | | | |
| 0.5 | 20 | 14.75 | 5 | | 0.5 | 0.5 | 0.1 | 4.7 | 1.2 | | | Cu |
| | 13.2 | 14.2 | 4 | | | | 0.16 | 5 | 4 | | | Zr |
| 4 | | 20 | | | 0.45 | 0.45 | 0.45 | 0.1 | 0.35 | | | Cu+S |
| 0.55 | | 19.5 | | | 0.2 | 0.55 | 0.08 | 1.4 | 2.4 | | | Cu+S |
| | | 25 | 10 | | | | | | | | | Ce 0.03 |
| 0.3 | 18.0 | 19.5 | | | | | 0.065 | 1.4 | 2.4 | | | |
| 35.0 | | 12.5 | 6.0 | | | | 0.05 | | 2.8 | | | B 0.015 |
| 5.0 | 18.0 | 19.5 | | | 1.0 | 1.0 | 0.1 | 2.0 | 3.5 | | | |
| 4.0 | 1.2 | 21.2 | 13.5 | 3.0 | 0.04 | 0.2 | 0.07 | | | 0.01 | | V 0.17 |
| | 20.0 | 20.0 | 5.85 | | | | 0.06 | 0.45 | 2.15 | | | |
| 5.0 | 0.5 | 15.5 | 16.0 | 3.5 | | | 0.01 | | | | | |
| 18.5 | 1.5 | 21.75 | 9 | 0.6 | 0.5 | 0.5 | 0.1 | | | | | |
| 1.2 | | 16.5 | 3.5 | | | | 0.05 | 1.2 | 1.2 | | | |
| | 19.5 | 19 | 4 | | 0.75 | 0.75 | 0.08 | 2.9 | 2.9 | | | B 0.01 |
| | 14 | 20 | 4.5 | | | | | 0.4 | 2.3 | | | Nb5 |
| 0.5 | 14 | 18 | 7 | | 0.25 | 0.25 | 0.05 | 2.1 | 2 | | | |
| 10.0 | 1.15 | 15.0 | 5.5 | | 0.3 | 0.1 | 0.12 | 20 | 2.5 | | | |
| 16.0 | 20.0 | 18.0 | 3.2 | | 1.0 | 0.8 | 0.03 | 0.2 | 2.8 | | | |
| | 15.0 | 10.0 | 3.0 | | | | 0.18 | 5.5 | 4.7 | | | V1.0 |
| | 10.0 | 8.9 | 2.0 | 7.0 | | | 0.1 | 4.7 | 2.5 | | | Hf1.05, Ta3.0 |
| 3.0 | 11.0 | 19.0 | 9.75 | | | | 0.06 | 1.6 | 2.5 | | | B 0.007 |
| 3.5 | 15.0 | 14.0 | 6.0 | 3.5 | 0.2 | 0.1 | 0.05 | 3.8 | 2.5 | | | |

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# Materials Cross Reference Chart

| Material Group | Country/Standard | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Commercial Designation | Allvac Designation | Allegheny Ludlum Designation | GERMANY/ITALY | | U.K. | FRANCE | USA |
| | | | | W.-Nr. | DIN | | AFNOR | AMS |
| Nickel based alloys | René 77 | | | | | | | |
| Nickel based alloys | René 80 | | | | | | | |
| Nickel based alloys | René 95 | | | | | | NC14K8 | |
| Nickel based alloys | TRW VIA | | | | NiTa9Co8W6CrAl | | | |
| Nickel based alloys | Udimet 500 | | | | NiCr18CoMoAlTi | | NCK19DAT | AISI:684 |
| Nickel based alloys | Udimet 520 | Allvac 520 | | | | | | |
| Nickel based alloys | Udimet 630 | | | | NiCr19NbMo | | | |
| Nickel based alloys | Udimet 700 | | | | NiCo15Cr15MoAlTi | | NCKD20AT | AISI:687 |
| Nickel based alloys | Udimet 710 | | | | | | NCK18TDA | |
| Nickel based alloys | Udimet 718 | | | | NiCr19Fe19NbMo | HR8 | NC19FeNb | 5583 |
| Nickel based alloys | Waspaloy | Allvac Waspaloy | | 2.4654 | NiCr20Co14MoTi | | NC20K14 | 5544 |

| Material Group | Country/Standard | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Commercial Designation | Allvac Designation | Allegheny Ludlum Designation | GERMANY/ITALY | | U.K. | FRANCE | USA |
| | | | | W.-Nr. | DIN | | AFNOR | AMS |
| Alpha Titanium alloys | Ti-5Al-2.5Sn | Allvac 5-2.5 | | | TiAl5Sn2 | TA 14,17 | T-A5E | ASTM: B 265 |
| Alpha Titanium alloys | Ti-7Al-4Mo | | | | TiAl7Mo4 | | | ASTM: B 381 |
| Alpha Titanium alloys | Ti-8Al-1Mo-1V | Allvac 8-1-1 | | | TiAl8Mo1V1 | | | 4915, 4933, 4972 |
| Alpha Titanium alloys | Ti-6Al-4Zr-2Mo-2Sn | Allvac 6-2-4-2 | | | TiAl6Zr4Mo2Sn2 | | | 4919, 4975, 4976 |
| Alpha Beta Titanium alloys | Ti-6Al-4V | Allvac 6-4 | | | TiAl6V4 | TA 10-13 TA 28 | T-A6V | 4906, 4920,4928, 4965, 4967 |
| Alpha Beta Titanium alloys | Ti-6Al-6V-2Sn | Allvac 6-6-2 | | | TiAl6V6Sn2 | | | 4971 |
| Alpha Beta Titanium alloys | Ti-4Al-4Mo-2Sn-0.5Si | Allvac 4-4-2 | | | TiAl4Mo4Sn2Si0.5 | 5103 | T-A4DE | |
| Alpha Beta Titanium alloys | Ti-4Al-4Mo-4Sn-0.5Si | | | | TiAl4Mo4Sn4Si0.5 | 5203 | | |
| Alpha Beta Titanium alloys | Ti-7Al-4Mo | | | | TiAl7Mo4 | | | ASTM: B 381 |
| Alpha Beta Titanium alloys | Ti-6Al-5Zr-0.5Mo- 0.25Si | | | | TiA6Zr5Mo0.5Si0.25 | | T-AGZ-50 | |
| Alpha Beta Titanium alloys | Ti-6Al-5Zr-4Mo-Cu- 0.2Si | | | | TiAl6Zr5Mo4CuSi0.2 | M201 | | |
| Alpha Beta Titanium alloys | Allvac 3-2.5 | Allvac 3-2.5 | | | | | | 4943, 4944 |
| Alpha Beta Titanium alloys | Allvac 6-4ELI | Allvac 6-4ELI | | | | | | 4907, 4930, 4931 |
| Alpha Beta Titanium alloys | Allvac 6-2-4-6 | Allvac 6-2-4-6 | | | | | | 4981 |
| Alpha Beta Titanium alloys | Allvac Ti-17 | Allvac Ti-17 | | | | | | 4995 |
| Beta Titanium alloys | Ti-13V-11Cr-3Al | Allvac 13-11-3 | | | TiV13Cr11Al3 | | | 4917 |
| Beta Titanium alloys | Ti-8Mo-8V-2Fe-3Al | | | | | | | |
| Beta Titanium alloys | Ti-3Al-8V-6Cr-4Mo-4Zr | Allvac 38-644 | | | | | | |
| Beta Titanium alloys | Ti-11.5Mo-6Zr-4.5Sn | | | | | | | |
| Pure Titanium | Ti 99.5 | Allvac 70, Ti CP-4 | | | Ti 99.5 | TA 6 | AIR: 9182 T60 | ASTM: B381F4 |
| Pure Titanium | Ti 99.6 | Allvac 55, Ti CP-3 | | | Ti 99.6 | | AIR: 9182 T50 | ASTM: B381F3 |
| Pure Titanium | Ti 99.7 | Allvac 40, Ti CP-2 | | | Ti 99.7a | TA 2-5 | AIR: 9182 T40 | ASTM: B381F2 |
| Pure Titanium | Ti 99.8 | Allvac 30, Ti CP-1 | | | Ti 99.8 | TA 1 | AIR: 9182 T35 | ASTM: B381F1 |
| Austempered ductile iron | 269-321 | | | | EN-GJS-800-8 | | | 125/80/10 (grade 1) |
| Austempered ductile iron | 269-321 | | | | EN-JS1100 | | | 850/550/10 (grade 1) |
| Austempered ductile iron | 302-363 | | | | EN-GJS-1000-5 | | | 150/100/7 (grade 2) |
| Austempered ductile iron | 302-363 | | | | EN-JS1110 | | | 1050/700/7 (grade 2) |
| Austempered ductile iron | 341-444 | | | | EN-GJS-1200-2 | | | 175/125/4 (grade 3) |
| Austempered ductile iron | 341-444 | | | | EN-JS1120 | | | 1200/850/4 (grade 4) |
| Austempered ductile iron | 444-555 | | | | EN-GJS-1400-1 | | | 230/185/--- (grade 5) |
| Austempered ductile iron | 444-555 | | | | EN-JS-1130 | | | 1600/1300/-- (grade 5) |

## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

| Fe | Co | Cr | Mo | W | Si | Mn | C | Al | Ti | P | S | Others |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.4 | 15.0 | 15.0 | 4.2 | | 0.1 | 0.1 | 0.07 | 4.3 | 3.3 | | | |
| | 9.5 | 14.0 | 4.0 | 4.0 | | | 0.17 | 3.0 | 5.0 | | | |
| | 8.0 | 14.0 | 3.5 | 3.5 | | | 0.15 | 3.5 | 2.5 | | | Nb3.5 |
| | 7.5 | 6.0 | 2.0 | 5.8 | | | 0.13 | 5.4 | 1.0 | | | Nb0.5, Ta9.0 |
| | 19.0 | | 4.0 | | 0.1 | 0.1 | 0.07 | 3.0 | 3.0 | | | |
| | 12 | 19 | 6 | 1 | | | | 2 | 3 | | | |
| 18.0 | 18.0 | | 3.0 | | | | 0.03 | 0.5 | 1.0 | | | Nb6.5 |
| | 16.5 | 15.0 | 5.0 | | | | 0.07 | 4.4 | 3.4 | | | |
| | 15.0 | 18.0 | 3.0 | 1.5 | | | 0.07 | 2.5 | 5.0 | | | |
| 18.0 | | 18.0 | 3.0 | | | | 0.05 | 0.6 | 1.0 | | | Nb+Ta5.2 |
| | 13.0 | 19.5 | 4.3 | | | | 0.05 | 1.40 | 3.0 | | | Zr .07 |

| Al | Sn | Mo | V | Zr | Si | | | | | | | Others |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5.0 | 2.5 | | | | | | | | | | | |
| 7.0 | | 4.0 | | | | | | | | | | |
| 8.0 | | 1.0 | 1.0 | | | | | | | | | |
| 6.0 | 2.0 | 2.0 | | 4.0 | | | | | | | | |
| 6.0 | | | 4.0 | | | | | | | | | |
| 5.5 | 2.0 | | 5.5 | | | | | | | | | |
| 4.0 | 2.0 | 4.0 | | | 0.55 | | | | | | | |
| 4.0 | 4.0 | 4.0 | | | 0.5 | | | | | | | |
| 7.0 | | 4.0 | | | | | | | | | | Fe 0.3 |
| 6.0 | | 0.5 | | 5.0 | 0.25 | | | | | | | |
| 6.0 | | 4.0 | | 5.0 | 0.2 | | | | | | | Cu 1.0 |
| 3.0 | | | 2.5 | | | | | | | | | Fe 0.13 |
| 6.0 | | | | | | | | | | | | Fe 0.2 |
| 6.0 | 2.0 | 6.0 | | 4.0 | | | | | | | | Fe 0.10 |
| 5.0 | 2.0 | 4.0 | | 2.0 | | | | | | | | Cr 4.0 |
| 3.0 | | | 13.0 | | | | | | | | | Cr 11.0 |
| 3.0 | | 8.0 | 8.0 | | | | | | | | | |
| 3.0 | | 4.0 | 8.0 | 4.0 | | | | | | | | Cr 6.0 |
| | 4.5 | 11.5 | | 6.0 | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

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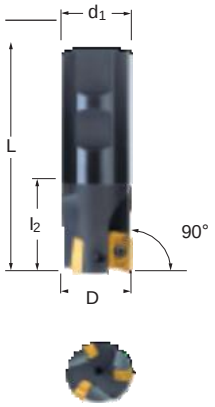
## Star Guide Key to Recommended Inserts

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

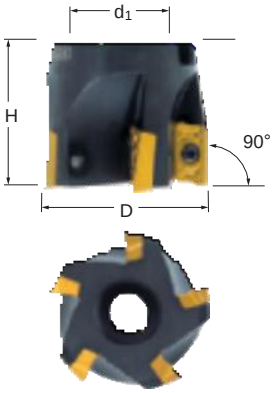









Weldon Shank




Shell Mill Fixation

## AFM 16 Weldon Shank

| EDP# | Part Number | Dimensions (mm) D | L/H | $l_2$ | $l_3$ | $d_1$ | $a_p$ max. | No. of teeth | Spares EDP# | | EDP# | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 021707 | **AFM 16 WA025R** | 25 | 96 | 40 | - | 25 | 16 | 2 | 015260 | D4008T | 015240 | T15 |
| 021708 | **AFM 16 WA032R** | 32 | 100 | 40 | - | 32 | 16 | 3 | 015262 | D4010T | 015240 | T15 |
| 021708 | **AFM 16 WA032R** | 40 | 110 | 50 | - | 32 | 16 | 4 | 015262 | D4010T | 015240 | T15 |

## AFM16 Shell Mill Fixation

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 017985 | **AFM 16 -A040R** | 40 | 40 | - | - | 16 | 16 | 4 | 015262 | D4010T | 015240 | T15 |
| 021700 | **AFM 16 -A050R** | 50 | 40 | - | - | 22 | 16 | 5 | 015262 | D4010T | 015240 | T15 |
| 021701 | **AFM 16 -A063R** | 63 | 40 | - | - | 22 | 16 | 5 | 015262 | D4010T | 015240 | T15 |
| 021702 | **AFM 16 -A080R** | 80 | 50 | - | - | 27 | 16 | 6 | 015262 | D4010T | 015240 | T15 |
| 021703 | **AFM 16 -A100R** | 100 | 50 | - | - | 32 | 16 | 7 | 015262 | D4010T | 015240 | T15 |
| 021704 | **AFM 16 -A125R** | 125 | 63 | - | - | 40 | 16 | 8 | 015262 | D4010T | 015240 | T15 |

## AFM16 Morse Taper Shank

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 018291 | **AFM 16 M025R** | 25 | 124 | 38 | 43 | MT3 | 16 | 2 | 015260 | D4008T | 015240 | T15 |
| 021705 | **AFM 16 M032R** | 32 | 124 | 38 | 43,5 | MT3 | 16 | 3 | 015262 | D4010T | 015240 | T15 |
| 021706 | **AFM 16 M040R** | 40 | 157 | 48 | 54,5 | MT4 | 16 | 4 | 015262 | D4010T | 015240 | T15 |

Milling Cutter Order Example: **AFM 16 WA025R**
Milling Insert Order Example: **APKT1604PDTR ...**
When using inserts with a radius larger than 2 mm, the cutter body has to be modified.

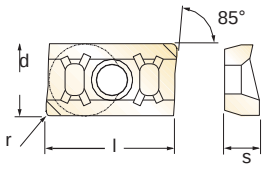





Depth of Cut ($a_p$)

## AP_16 Recommended Cutting Conditions

| Material | ▼ Roughing Speed $V_c$ (m/min) | Feed $h_m$ (mm) | D.O.C. $a_p$ (mm) | ▼▼ SemiFinishing Speed $V_c$ (m/min) | Feed $h_m$ (mm) | D.O.C. $a_p$ (mm) | ▼▼▼ Finishing Speed $V_c$ (m/min) | Feed $h_m$ (mm) | D.O.C. $a_p$ (mm) |
|---|---|---|---|---|---|---|---|---|---|
| Unalloyed Steels | 180 - 220 | 0,14 - 0,24 | 8,0 - 16,0 | 220 - 260 | 0,12 - 0,35 | 3,0 - 8,0 | 220 - 300 | 0,15 - 0,45 | 0,2 - 3,0 |
| Alloyed Steels | 70 - 110 | 0,12 - 0,20 | 8,0 - 16,0 | 100 - 150 | 0,12 - 0,30 | 3,0 - 8,0 | 100 - 195 | 0,15 - 0,40 | 0,2 - 3,0 |
| Stainless Steels | - | - | - | 140 - 180 | 0,12 - 0,25 | 3,0 - 8,0 | 180 - 230 | 0,15 - 0,28 | 0,2 - 3,0 |
| PH Stainless | - | - | - | 70 - 85 | 0,10 - 0,20 | 3,0 - 8,0 | 80 - 100 | 0,10 - 0,20 | 0,2 - 3,0 |
| Cast Irons | 140 - 280 | 0,10 - 0,16 | 8,0 - 16,0 | 180 - 300 | 0,12 - 0,25 | 3,0 - 8,0 | 200 - 350 | 0,18 - 0,30 | 0,2 - 3,0 |
| Aluminium & Alloys | 275 - 450 | 0,06 - 0,25 | 8,0 - 16,0 | 400 - 750 | 0,04 - 0,20 | 3,0 - 8,0 | 700 - 1000 | 0,08 - 0,30 | 0,2 - 3,0 |
| High Temp. Alloys | - | - | - | 35 - 50 | 0,10 - 0,20 | 3,0 - 8,0 | 45 - 60 | 0,10 - 0,20 | 0,2 - 3,0 |
| Hard Steels (52-56 HRC) | - | - | - | 50 - 85 | 0,04 - 0,08 | 1,5 - 3,5 | 50 - 100 | 0,06 - 0,10 | 0,2 - 1,5 |




| EDP# | Part Number | Grade | Application & Material: Roughing | Semi-Finishing | Finishing | Dimensions (mm): d | l | s | r | $h_m$ min |
|---|---|---|---|---|---|---|---|---|---|---|
| 023102 | APKT 16 0402PDTR | A04030 | | | | 9,52 | 16,66 | 4,76 | 0,2 | 0,1 |
| 023103 | APKT 16 0408PDTR | A04030 | | | | 9,52 | 16,66 | 4,76 | 0,8 | 0,1 |
| 023104 | APKT 16 0410PDTR | A04030 | | | | 9,52 | 16,66 | 4,76 | 1,0 | 0,1 |
| 023105 | APKT 16 0415PDTR | A04030 | | | | 9,52 | 16,66 | 4,76 | 1,5 | 0,1 |
| 023106 | APKT 16 0420PDTR | A04030 | | | | 9,52 | 16,66 | 4,76 | 2,0 | 0,1 |
| 017618 | APKT16 0425PDTR | 750 | | | | 9,52 | 16,66 | 4,76 | 2,5 | 0,1 |
| 017619 | APKT16 0425PDTR | XT500 | | | | 9,52 | 16,66 | 4,76 | 2,5 | 0,1 |
| 023107 | APKT 16 0430PDTR | A04030 | | | | 9,52 | 16,66 | 4,76 | 3,0 | 0,1 |
| 017290 | APKT 16 0440PDTR | 750 | | | | 9,52 | 16,66 | 4,76 | 4,0 | 0,1 |
| 024921 | APKT 16 0440PDTR | A04030 | | | | 9,52 | 16,66 | 4,76 | 4,0 | 0,1 |
| 017620 | APKT 16 0440PDTR | XT500 | | | | 9,52 | 16,66 | 4,76 | 4,0 | 0,1 |
| 025804 | APKT 16 0460PDTR | A04030 | | | | 9,52 | 16,66 | 4,76 | 6,0 | 0,1 |

APKT 16_



| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 027863 | APKT 16 0408PDSR | 750S | | | | 9,52 | 16,66 | 4,76 | 0,8 | 0,1 |
| 027869 | APKT 16 0408PDSR | XT500 | | | | 9,53 | 16,67 | 4,76 | 0,8 | 0,1 |
| 027864 | APKT 16 0416PDSR | 750S | | | | 9,54 | 16,68 | 4,76 | 1,6 | 0,1 |
| 027870 | APKT 16 0416PDSR | XT500 | | | | 9,55 | 16,69 | 4,76 | 1,6 | 0,1 |
| 027865 | APKT 16 0424PDSR | 750S | | | | 9,56 | 16,70 | 4,76 | 2,4 | 0,1 |
| 027871 | APKT 16 0424PDSR | XT500 | | | | 9,57 | 16,71 | 4,76 | 2,4 | 0,1 |
| 027862 | APKT 16 0432PDSR | 750S | | | | 9,58 | 16,72 | 4,76 | 3,2 | 0,1 |
| 027866 | APKT 16 0432PDSR | XT500 | | | | 9,59 | 16,73 | 4,76 | 3,2 | 0,1 |
| 027873 | APKT 16 0440PDSR | 750S | | | | 9,60 | 16,74 | 4,76 | 4,0 | 0,1 |
| 027873 | APKT 16 0440PDSR | XT500 | | | | 9,61 | 16,75 | 4,76 | 4,0 | 0,1 |
| 027887 | APKT 16 0450PDSR | 750S | | | | 9,62 | 16,76 | 4,76 | 5,0 | 0,1 |
| 027874 | APKT 16 0450PDSR | XT500 | | | | 9,63 | 16,77 | 4,76 | 5,0 | 0,1 |
| 027868 | APKT 16 0464PDSR | 750S | | | | 9,64 | 16,78 | 4,76 | 6,4 | 0,1 |

APHT 16_
-46



## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |






## AMF OD 06 Shell Mill Fixation Medium Pitch

| EDP# | Part Number | Dimensions (mm) D | L/H | | $l_2$ | $d_1$ | $a_{p1}$ max. | $a_p$ max. | No. of teeth | Spares EDP# | | EDP# | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 026681 | **AMF OD 06 -A050R** | 50 | 40 | - | 22 | 10 | 4,5 | | 4 | 015270 | F4011T | 015241 | T20 |
| 026682 | **AMF OD 06 -A063R** | 63 | 40 | - | 22 | 10 | 4,5 | | 5 | 015270 | F4011T | 015241 | T20 |
| 026683 | **AMF OD 06 -A080R** | 80 | 50 | - | 27 | 10 | 4,5 | | 6 | 015270 | F4011T | 015241 | T20 |
| 026684 | **AMF OD 06 -A100R** | 100 | 55 | - | 32 | 10 | 4,5 | | 7 | 015270 | F4011T | 015241 | T20 |
| 026685 | **AMF OD 06 -A125R** | 125 | 63 | - | 40 | 10 | 4,5 | | 8 | 015270 | F4011T | 015241 | T20 |
| 026686 | **AMF OD 06 -160R** | 160 | 63 | - | 40 | 10 | 4,5 | | 10 | 015270 | F4011T | 015241 | T20 |



Shell Mill Fixation

## 7745 VOD 06 Shell Mill Fixation Fine Pitch

| EDP# | Part Number | D | L/H | | $l_2$ | $d_1$ | $a_{p1}$ max. | $a_p$ max. | No. of teeth | Spares EDP# | | EDP# | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 027911 | **AMF OD 06 -A080Z08R** | 80 | 50 | - | 27 | 10 | 4,5 | | 8 | 015270 | F4011T | 015241 | T20 |
| 027876 | **AMF OD 06 -A100Z09R** | 100 | 55 | - | 32 | 10 | 4,5 | | 9 | 015270 | F4011T | 015241 | T20 |
| 027877 | **AMF OD 06 -A125Z11R** | 125 | 63 | - | 40 | 10 | 4,5 | | 11 | 015270 | F4011T | 015241 | T20 |
| 027878 | **AMF OD 06 -160Z14R** | 160 | 63 | - | 40 | 10 | 4,5 | | 14 | 015270 | F4011T | 015241 | T20 |

Milling cutters with through coolant except ø 160.



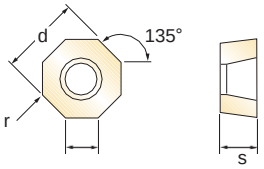
Milling Cutter Order Example: **AMF OD 06-A080R**
Milling Insert Order Example: **ODMT0605…**

Feedrate compensation: For 45° cutting, divide the $h_m$ value by the sine of the approach angle (the sine of 45° = 0,707)

ie: $\frac{h_m}{0,707}$ or $\frac{0,08}{0,707}$ = 0,113 mm programmed feed rate




Depth of Cut ($a_p$)

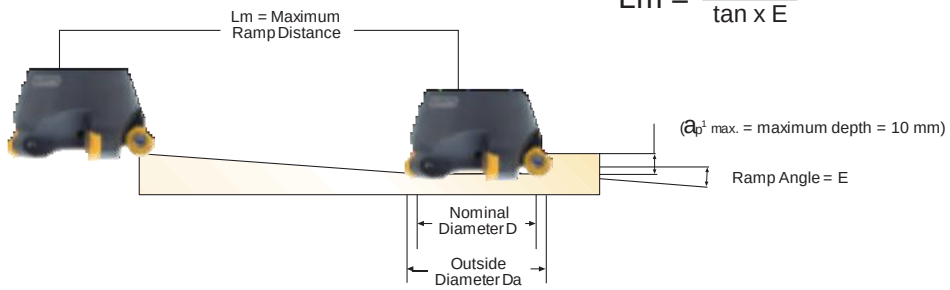



| EDP# | Part Number | Grade | Application & Material ▼ Roughing | ▼▼ SemiFinishing | ▼▼▼ Finishing | Dimensions (mm) d | l | s | r | $h_m$ min |
|---|---|---|---|---|---|---|---|---|---|---|
| 026591 | ODMT0605PEN | A04030 | | | ♦ | 16,0 | 6,0 | 5,55 | Facet | 0,04 |
| 026598 | ODMT0605PEN | 750 | | | ♦♦♦ | 16,0 | 6,0 | 5,55 | Facet | 0,04 |
| 027891 | ODMT0605PEN | 750S | | | | 16,0 | 6,0 | 5,55 | Facet | 0,04 |
| 026592 | ODMT0605PEN | XT500 | | | ♦♦ | 16,0 | 6,0 | 5,55 | Facet | 0,04 |
| 026588 | ODGT0605AFN | H01 | ♦ | ♦ | ♦ | 16,0 | 6,0 | 5,55 | Facet | 0,02 |
| 027885 | ODMW0605PTR | K01 | ♦ | ♦ | ♦ | 16,0 | 6,0 | 5,55 | Facet | 0,19 |
| 026589 | ODMT0605AEN | A04030 | | ♦ | | 16,0 | 6,0 | 5,55 | Facet | 0,04 |
| 026597 | ODMT0605AEN | 750 | | ♦♦♦ | | 16,0 | 6,0 | 5,55 | Facet | 0,04 |
| 027892 | ODMT0605AEN | 750S | | | | 16,0 | 6,0 | 5,55 | Facet | 0,04 |
| 026590 | ODMT0605AEN | XT500 | ♦ | ♦♦ | | 16,0 | 6,0 | 5,55 | Facet | 0,04 |




## Linear Ramp Milling Method

$$Lm = \frac{a_{p^1}}{\tan x\ E}$$




| Ramp Angle | |
|---|---|
| Ø 50 | 6,0º |
| Ø 63 | 4,6º |
| Ø 80 | 3,3º |
| Ø 100 | 2,6º |
| Ø 125 | 2,0º |
| Ø 160 | 1,5º |

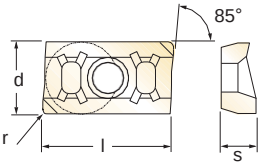
## OD_06 Recommended Cutting Conditions

| Material | ▼ Roughing Speed $V_c$ (m/min) | Feed $h_m$ (mm) | D.O.C. $a_p$ (mm) | ▼▼ SemiFinishing Speed $V_c$ (m/min) | Feed $h_m$ (mm) | D.O.C. $a_p$ (mm) | ▼▼▼ Finishing Speed $V_c$ (m/min) | Feed $h_m$ (mm) | D.O.C. $a_p$ (mm) |
|---|---|---|---|---|---|---|---|---|---|
| ♦ Unalloyed Steels | 180 - 220 | 0,30 - 0,70 | 2,5 - 4,5 | 220 - 260 | 0,20 - 0,40 | 1,0 - 2,0 | 220 - 300 | 0,08 - 0,15 | 0,2 - 1,0 |
| ♦ Alloyed Steels | 70 - 110 | 0,27 - 0,50 | 2,5 - 4,5 | 100 - 150 | 0,20 - 0,35 | 1,0 - 2,0 | 100 - 195 | 0,08 - 0,15 | 0,2 - 1,0 |
| ♦ Stainless Steels | 120 - 140 | 0,27 - 0,40 | 2,5 - 4,5 | 140 - 180 | 0,15 - 0,25 | 1,0 - 2,0 | 180 - 230 | 0,05 - 0,15 | 0,2 - 1,0 |
| ♦ PH Stainless | 55 - 70 | 0,15 - 0,30 | 2,5 - 4,5 | 70 - 85 | 0,10 - 0,20 | 1,0 - 2,0 | 80 - 100 | 0,05 - 0,10 | 0,2 - 1,0 |
| ♦ Cast Irons | 155 - 290 | 0,20 - 0,45 | 2,5 - 4,5 | 195 - 310 | 0,15 - 0,30 | 1,0 - 2,0 | 215 - 360 | 0,05 - 0,15 | 0,2 - 1,0 |
| ♦ Aluminium & Alloys | 275 - 450 | 0,20 - 0,35 | 2,5 - 4,5 | 400 - 750 | 0,10 - 0,25 | 1,0 - 2,0 | 700 - 1000 | 0,05 - 0,15 | 0,2 - 1,0 |
| ♦ High Temp. Alloys | 25 - 40 | 0,17 - 0,25 | 2,5 - 4,5 | 35 - 50 | 0,10 - 0,20 | 1,0 - 2,0 | 45 - 60 | 0,05 - 0,10 | 0,2 - 1,0 |
| ♦ Hard Steels (52-56 HRC) | - | - | - | 50 - 85 | 0,06 - 0,12 | 0,5 - 1,5 | 50 - 100 | 0,03 - 0,06 | 0,2 - 0,5 |

$h_m$ = average chip thickness

## Star Guide Key to Recommended Tools

| Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |




| EDP# | Part Number | Grade | Application & Material Roughing ▼ | SemiFinishing ▼▼ | Finishing ▼▼▼ | Dimensions (mm) d | l | s | r | $h_m$ min |
|---|---|---|---|---|---|---|---|---|---|---|
| 027914 | APKT11T3PDER | 750S | | | | 7,87 | 11,70 | 3,76 | Facet | 0,05 |
| 027913 | APKT11T3PDER | XT500 | | | | 7,87 | 11,70 | 3,76 | Facet | 0,05 |
| 027915 | APKT11T3PDER | A04030 | ◆ | | | 7,87 | 11,70 | 3,76 | Facet | 0,05 |
| 027916 | APKT11T3PDER | K01 | ◆ | | | 7,87 | 11,70 | 3,76 | Facet | 0,05 |
| 029088 | APGT11T3PDFR | H01 | ◆ | | | 7,96 | 11,90 | 3,76 | Facet | 0,05 |
| 029826 | APKT11T308R | 750 | ◆ | | | 8,00 | 11,90 | 3,76 | Facet | 0,05 |
| 029827 | APKT11T316R | XT500 | ◆◆ | | | 8,00 | 11,90 | 3,76 | Facet | 0,05 |
| 029828 | APKT11T324R | 750 | ◆ | | | 8,00 | 11,90 | 3,76 | 0,8 | 0,05 |
| 029809 | APKT11T332R | XT500 | ◆◆ | | | 8,00 | 11,90 | 3,76 | 0,8 | 0,05 |



APKT 11T3





Please note that for the 5315 range, only a maximum 0,8mm radius is allowed.

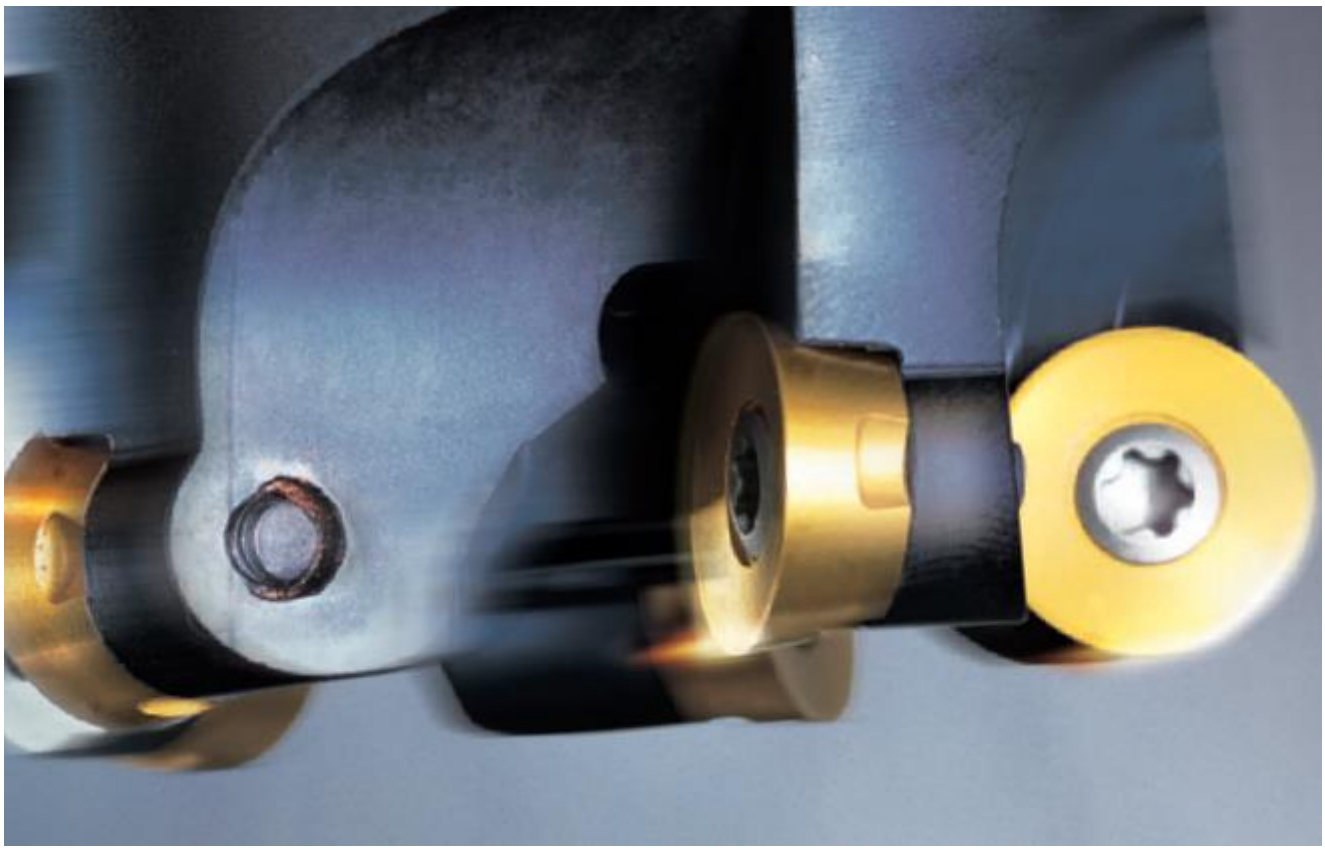
## APKT11T3 Recommended Cutting Conditions

| Material | Roughing Speed $V_c$ (m/min) | Roughing Feed $h_m$ (mm) | Roughing D.O.C. $a_p$ (mm) | SemiFinishing Speed $V_c$ (m/min) | SemiFinishing Feed $h_m$ (mm) | SemiFinishing D.O.C. $a_p$ (mm) | Finishing Speed $V_c$ (m/min) | Finishing Feed $h_m$ (mm) | Finishing D.O.C. $a_p$ (mm) |
|---|---|---|---|---|---|---|---|---|---|
| Unalloyed Steels | 120 - 305 | 0,06 - 0,12 | - | - | - | - | - | - | - |
| Alloyed Steels | 75 - 175 | 0,06 - 0,10 | - | - | - | - | - | - | - |
| Stainless Steels | 115 - 160 | 0,06 - 0,10 | - | - | - | - | - | - | - |
| PH Stainless | 95 - 150 | 0,06 - 0,10 | - | - | - | - | - | - | - |
| Cast Irons | 115 - 400 | 0,06 - 0,13 | - | - | - | - | - | - | - |
| Aluminium & Alloys | 200 - 800 | 0,04 - 0,20 | - | - | - | - | - | - | - |
| High Temp. Alloys | 25 - 40 | 0,04 - 0,10 | - | - | - | - | - | - | - |
| Hard Steels (52-56 HRC) | - | - | - | - | - | - | - | $h_m$ = average | chip thickness |

**NOTE:** For material families [M] (stainless steel and PH stainless) and [S] (high temperature alloys) the -46 insert geometry is only profile these materials, not slotting.
For D.O.C. please refer to $a_p$ max

## Star Guide Key to Recommended Tools

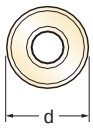
| Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |



These versatile tools are used for face milling, radius end milling, slotting, pocketing, contour milling and hole milling.

All Stellram Contour Milling Cutters feature P-20 tool steel bodies. Through-tool coolant allows better chip evacuation, higher feed rates. They can be used in roughing and finishing operations.









| EDP# | Part Number | Grade | Application & Material Roughing ▼ | SemiFinishing ▼▼ | Finishing ▼▼▼ | d | l | s | r | $h_m$min | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 017679 | RPET10T3M0E | A04030 | | | ◆ | 10,0 | - | 3,97 | 5,0 | 0,03 | RPET 10_ |
| 017678 | RPET10T3M0E | XT500 | | | | 10,0 | - | 3,97 | 5,0 | 0,03 | |
| 015215 | RPEX10T3M0E | A04030 | | | | 10,0 | - | 3,97 | 5,0 | 0,02 | RPEX 10_ |
| 017688 | RPEX10T3M0F | H01 | ◆ | ◆ | ◆ | 10,0 | - | 3,97 | 5,0 | 0,02 | |
| 023317 | RPEX10T3M0F | A04030 | | | | 10,0 | - | 3,97 | 5,0 | 0,02 | |
| 017690 | RPHT10T3M0T | X500 | | | | 10,0 | - | 3,97 | 5,0 | 0,075 | RPHT 10_ |
| 027726 | RPHT10T3M0T | SP6564 | | ◆◆ | | 10,0 | - | 3,97 | 5,0 | 0,075 | |
| 015145 | RPHT10T3M0E | XT500 | | ◆◆ | ◆◆ | 10,0 | - | 3,97 | 5,0 | 0,04 | RPHT 10_ |
| 027725 | RPHT10T3M0E | 750S | | | ◆◆ | 10,0 | - | 3,97 | 5,0 | 0,04 | |
| 023329 | RPMT10T3M0E-4T | A04030 | ◆◆ | ◆ | ◆ | 10,0 | - | 3,97 | 5,0 | 0,04 | RPMT 10_ -4T |
| 015221 | RPMT10T3M0E-4T | XT500 | ◆◆ | | | 10,0 | - | 3,97 | 5,0 | 0,04 | |
| 027729 | RPMT10T3M0E-4T | 750S | ◆◆ | | | 10,0 | - | 3,97 | 5,0 | 0,04 | |
| 025839 | RPMW10T3M0T | XT500 | | | | 10,0 | - | 3,97 | 5,0 | 0,13 | RPMW 10 |

## RP_10 Recommended Cutting Conditions

| Material | ▼ Roughing Speed $V_c$ (m/min) | Feed $h_m$ (mm) | D.O.C. $a_p$ (mm) | ▼▼ SemiFinishing Speed $V_c$ (m/min) | Feed $h_m$ (mm) | D.O.C. $a_p$ (mm) | ▼▼▼ Finishing Speed $V_c$ (m/min) | Feed $h_m$ (mm) | D.O.C. $a_p$ (mm) |
|---|---|---|---|---|---|---|---|---|---|
| ◆ Unalloyed Steels | 180 - 220 | 0,15 - 0,28 | 2,5 - 5,0 | 220 - 260 | 0,12 - 0,20 | 1,0 - 2,5 | 220 - 300 | 0,10 - 0,18 | 0,1 - 1,0 |
| ◆ Alloyed Steels | 70 - 110 | 0,12 - 0,24 | 2,5 - 4,0 | 100 - 150 | 0,10 - 0,18 | 1,0 - 2,5 | 100 - 195 | 0,08 - 0,14 | 0,1 - 1,0 |
| ◆ Stainless Steels | 120 - 140 | 0,10 - 0,16 | 2,5 - 4,0 | 140 - 180 | 0,08 - 0,14 | 1,0 - 2,5 | 180 - 230 | 0,08 - 0,10 | 0,1 - 1,0 |
| ◆ PH Stainless | 55 - 70 | 0,08 - 0,14 | 2,5 - 4,0 | 70 - 85 | 0,08 - 0,12 | 1,0 - 2,5 | 80 - 100 | 0,08 - 0,10 | 0,1 - 1,0 |
| ◆ Cast Irons | 140 - 280 | 0,12 - 0,24 | 2,5 - 4,0 | 180 - 300 | 0,10 - 0,18 | 1,0 - 2,5 | 200 - 350 | 0,08 - 0,14 | 0,1 - 1,0 |
| ◆ Aluminium & Alloys | 275 - 450 | 0,06 - 0,12 | 2,5 - 5,0 | 400 - 750 | 0,04 - 0,10 | 1,0 - 2,5 | 700 - 1000 | 0,04 - 0,08 | 0,1 - 1,0 |
| ◆ High Temp. Alloys | 25 - 40 | 0,08 - 0,14 | 2,5 - 4,0 | 35 - 50 | 0,08 - 0,12 | 1,0 - 2,5 | 45 - 60 | 0,08 - 0,10 | 0,1 - 1,0 |
| ◆ Hard Steels (52-56 HRC) | - | - | - | - | - | - | 50 - 100 | 0,08 - 0,03 | 0,1 - 0,5 |

$h_m$ = average chip thickness

## Star Guide — Key to Recommended Tools

| Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |



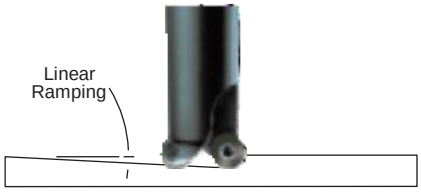




| EDP# | Part Number | Grade | Application & Material ▼ Roughing | ▼▼ SemiFinishing | ▼▼▼ Finishing | d | l | s | r | $h_m$ min | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 029271 | RPET 12 04M0E | A04030 | | | ◆ | 12,0 | - | 4,76 | 6,0 | 0,03 | RPET 12_ |
| 029279 | RPET 12 04M0E | 750 | | | | 12,0 | - | 4,76 | 6,0 | 0,03 | |
| 029280 | RPET 12 04M0E | A04030 | | ◆ | ◆ | 12,0 | - | 4,76 | 6,0 | 0,03 | |
| 029282 | RPEX 12 04M0E | XT500 | | ◆ | ◆ | 12,0 | - | 4,76 | 6,0 | 0,02 | RPEX 12_ |
| 029283 | RPEX 12 04M0F | A04030 | | | ◆◆ | 12,0 | - | 4,76 | 6,0 | 0,02 | |
| 029284 | RPEX 12 04M0F | H01 | ◆ | ◆ | ◆ | 12,0 | - | 4,76 | 6,0 | 0,02 | |
| 029286 | RPHT 12 04M0E | XT500 | | ◆◆ | | 12,0 | - | 4,76 | 6,0 | 1,10 | RPHT 12_ |
| 029287 | RPHT 12 04M0E | K01 | | ◆ | ◆◆ | 12,0 | - | 4,76 | 6,0 | 1,10 | |
| 029289 | RPHT1204M0T | 750S | ◆◆ | ◆◆ | | 12,0 | - | 4,76 | 6,0 | 0,04 | RPHT 12_ |
| 029290 | RPHT1204M0T | 750 | ◆◆ | ◆◆ | | 12,0 | - | 4,76 | 6,0 | 0,04 | |
| 029272 | RPMT1204M0E-4T | XT500 | ◆ | ◆ | ◆ | 12,0 | - | 4,76 | 6,0 | 0,05 | RPMT 12_ -4T |
| 029291 | RPMT1204M0E-4T | A04030 | ◆◆ | ◆◆ | | 12,0 | - | 4,76 | 6,0 | 0,05 | |
| 029293 | RPMT1204M0E-4T | 750 | ◆◆ | ◆◆ | | 12,0 | - | 4,76 | 6,0 | 0,05 | |
| 029294 | RPMW1204M0T | A04030 | ◆◆ | | | 12,0 | - | 4,76 | 6,0 | 0,13 | RPMW 12_ |
| 029295 | RPMW1204M0T | XT500 | | | | 12,0 | - | 4,76 | 6,0 | 0,13 | |
| 029296 | RPMW1204M0T | 750 | ◆◆ | | | 12,0 | - | 4,76 | 6,0 | 0,13 | |

## Linear Ramping

| Description | Diameter at Axis | External Diameter | Insert Diameter | Ramp angle | linear ramping $a_p$ max. | linear ramping length |
|---|---|---|---|---|---|---|
| AMFR12-A040R | 40 | 52 | 12 | 4.15º | 6 | 82.69 |
| AMFR12-A050R | 50 | 62 | 12 | 4.4º | 6 | 77.98 |
| AMFR12-A063R | 63 | 75 | 12 | 3.5º | 6 | 98.10 |
| AMFR12-A080R | 80 | 92 | 12 | 2.63º | 6 | 130.62 |
| AMFR12-A100R | 100 | 112 | 12 | 2.15º | 6 | 159.82 |
| AMFR12-A125R | 125 | 137 | 12 | 1.6º | 6 | 214.80 |



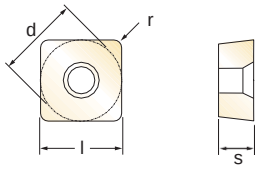

## RP_12 Recommended Cutting Conditions

| Material | ▼ Roughing Speed $V_c$ (m/min) | Feed $h_m$ (mm) | D.O.C. $a_p$ (mm) | ▼▼ SemiFinishing Speed $V_c$ (m/min) | Feed $h_m$ (mm) | D.O.C. $a_p$ (mm) | ▼▼▼ Finishing Speed $V_c$ (m/min) | Feed $h_m$ (mm) | D.O.C. $a_p$ (mm) |
|---|---|---|---|---|---|---|---|---|---|
| ◆ Unalloyed Steels | 180 - 220 | 0,16 - 0,30 | 2,5 - 6,0 | 220 - 260 | 0,14 - 0,22 | 1,0 - 3,0 | 220 - 300 | 0,12 - 0,18 | 0,1 - 1,0 |
| ◆ Alloyed Steels | 70 - 110 | 0,14 - 0,25 | 2,5 - 6,0 | 100 - 150 | 0,12 - 0,20 | 1,0 - 3,0 | 100 - 195 | 0,08 - 0,16 | 0,1 - 1,0 |
| ◆ Stainless Steels | 120 - 140 | 0,10 - 0,18 | 2,5 - 4,0 | 140 - 180 | 0,08 - 0,14 | 1,0 - 3,0 | 180 - 230 | 0,08 - 0,12 | 0,1 - 1,0 |
| ◆ PH Stainless | - | - | - | 70 - 85 | 0,08 - 0,12 | 1,0 - 3,0 | 80 - 100 | 0,08 - 0,10 | 0,1 - 1,0 |
| ◆ Cast Irons | 140 - 280 | 0,14 - 0,25 | 2,5 - 6,0 | 180 - 300 | 0,12 - 0,20 | 1,0 - 3,0 | 200 - 350 | 0,08 - 0,16 | 0,1 - 1,0 |
| ◆ Aluminium & Alloys | 275 - 450 | 0,06 - 0,12 | 2,5 - 6,0 | 400 - 750 | 0,06 - 0,10 | 1,0 - 3,0 | 700 - 1000 | 0,04 - 0,08 | 0,1 - 1,0 |
| ◆ High Temp. Alloys | - | - | - | 35 - 50 | 0,08 - 0,12 | 1,0 - 3,0 | 45 - 60 | 0,08 - 0,10 | 0,1 - 1,0 |
| ◆ Hard Steels (52-56 HRC) | - | - | - | - | - | - | - | - | - |

$h_m$ = average chip thickness

## Star Guide Key to Recommended Tools

| Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |






**SDHT_** Ground circumference χ 45° one face pressed chip-breaker.

| EDP# | Part Number | Grade | Dimensions (mm) d | l | s | r | $h_m$ min |
|---|---|---|---|---|---|---|---|
| 017320 | SDHT09T3AEEN | 750 | 9,52 | 9,52 | 3,97 | Facet | 0,03 |
| 023356 | SDHT09T3AEEN | A04030 | 9,52 | 9,52 | 3,97 | Facet | 0,03 |
| 015186 | SDHT09T3AEEN | XT500 | 9,52 | 9,52 | 3,97 | Facet | 0,03 |
| 027733 | SDHT09T3AEEN | 750S | 9,52 | 9,52 | 3,97 | Facet | 0,03 |
| 017321 | SDHT1204AEEN | 750 | 12,7 | 12,7 | 4,76 | 8,0 | 0,04 |
| 015133 | SDHT1204AEEN | A04030 | 12,7 | 12,7 | 4,76 | 8,0 | 0,04 |
| 015187 | SDHT1204AEEN | XT500 | 12,7 | 12,7 | 4,76 | 8,0 | 0,04 |
| 027734 | SDHT1204AEEN | 750S | 12,7 | 12,7 | 4,76 | 8,0 | 0,04 |



**SDHW_** Ground circumference χ 45° without chip-breaker.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 017323 | SDHW 09 T3AETN | 750 | 9,52 | 9,52 | 3,97 | Facet | 0,10 |
| 023358 | SDHW 09 T3AETN | A04030 | 9,52 | 9,52 | 3,97 | Facet | 0,10 |
| 015231 | SDHW 09 T3AETN | XT500 | 9,52 | 9,52 | 3,97 | Facet | 0,10 |
| 017324 | SDHW 12 04AETN | 750 | 12,7 | 12,7 | 4,76 | Facet | 0,15 |
| 015134 | SDHW 12 04AETN | A04030 | 12,7 | 12,7 | 4,76 | Facet | 0,15 |
| 017730 | SDHW 12 04AETN | XT500 | 12,7 | 12,7 | 4,76 | Facet | 0,15 |
| 017731 | SDHW 15 05AETN | XT500 | 15,88 | 15,88 | 5,56 | Facet | 0,15 |



**SDKT_** Ground wiper facet χ 45° one face pressed chip-breaker.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 026600 | SDKT 09 T3AEEN | 750 | 9,52 | 9,52 | 3,97 | Facet | 0,05 |
| 026602 | SDKT 09 T3AEEN | XT500 | 9,52 | 9,52 | 3,97 | Facet | 0,05 |
| 027738 | SDKT 09 T3AEEN | 750S | 9,52 | 9,52 | 3,97 | Facet | 0,05 |
| 029456 | SDKT 12 04AEEN | 750 | 12,7 | 12,7 | 4,76 | Facet | 0,05 |
| 029457 | SDKT 12 04AEEN | XT500 | 12,7 | 12,7 | 4,76 | Facet | 0,05 |
| 029455 | SDKT 12 04AEEN | 750 | 12,7 | 12,7 | 4,76 | Facet | 0,05 |



**SDMT_-4T** As pressed circumference one face pressed chip-breaker.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 017325 | SDMT 09 T308EN-4T | 750 | 9,52 | 9,52 | 3,97 | 0,8 | 0,04 |
| 023362 | SDMT 09 T308EN-4T | A04030 | 9,52 | 9,52 | 3,97 | 0,8 | 0,04 |
| 014410 | SDMT 09 T308EN-4T | XT500 | 9,52 | 9,52 | 3,97 | 0,8 | 0,04 |
| 027736 | SDMT 09 T308EN-4T | 750S | 9,52 | 9,52 | 3,97 | 0,8 | 0,04 |
| 017326 | SDMT 12 0412EN-4T | 750 | 12,7 | 12,7 | 4,76 | 1,2 | 0,05 |
| 015135 | SDMT 12 0412EN-4T | A04030 | 12,7 | 12,7 | 4,76 | 1,2 | 0,05 |
| 014411 | SDMT 12 0412EN-4T | XT500 | 12,7 | 12,7 | 4,76 | 1,2 | 0,05 |
| 027737 | SDMT 12 0412EN-4T | 750S | 12,7 | 12,7 | 4,76 | 1,2 | 0,05 |



**SDMW_** As pressed circumference without chip-breaker.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 017327 | SDMW 09 T308TN | 750 | 9,52 | 9,52 | 3,97 | 0,8 | 0,15 |
| 027742 | SDMW 09 T308TN | 750S | 9,52 | 9,52 | 3,97 | 0,8 | 0,15 |
| 023363 | SDMW 09 T308TN | A04030 | 9,52 | 9,52 | 3,97 | 0,8 | 0,15 |
| 015232 | SDMW 09 T308TN | XT500 | 9,52 | 9,52 | 3,97 | 0,8 | 0,12 |
| 017328 | SDMW 12 0412TN | 750 | 12,7 | 12,7 | 4,76 | 1,2 | 0,15 |
| 015136 | SDMW 12 0412TN | A04030 | 12,7 | 12,7 | 4,76 | 1,2 | 0,15 |
| 015233 | SDMW 12 0412TN | XT500 | 12,7 | 12,7 | 4,76 | 1,2 | 0,12 |



**SEHT_** Ground circumference χ 45° one face pressed chip-breaker.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 012470 | SEHT 12 04AF | 750 | 12,7 | 12,7 | 4,76 | Facet | 0,12 |
| 012469 | SEHT 12 04AFER | A04030 | 12,7 | 12,7 | 4,76 | Facet | 0,12 |
| 012990 | SEHWT12 04AF | 750 | 12,7 | 12,7 | 4,76 | Facet | 0,12 |



**SEHT_** Ground circumference χ 45° without chip-breaker.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 010832 | SEKN 12 03AFEN | 750 | 12,7 | 12,7 | 3,18 | Facet | 0,12 |
| 009252 | SEKN 12 03AFEN | A04030 | 12,7 | 12,7 | 3,18 | Facet | 0,12 |
| 009247 | SEKN 12 03AFEN | K01 | 12,7 | 12,7 | 3,18 | Facet | 0,12 |
| 017862 | SEKN 12 03AFFN | H01 | 12,7 | 12,7 | 3,18 | Facet | 0,12 |
| 010834 | SEKN 12 04AFEN | 750 | 12,7 | 12,7 | 4,76 | Facet | 0,12 |
| 009253 | SEEN 12 04AFEN | A04030 | 12,7 | 12,7 | 4,76 | Facet | 0,12 |
| 011344 | SEKN 15 04AFEN | 750 | 15,88 | 15,88 | 4,76 | Facet | 0,12 |
| 009254 | SEKN 15 04AFEN | A04030 | 15,88 | 15,88 | 4,76 | Facet | 0,12 |

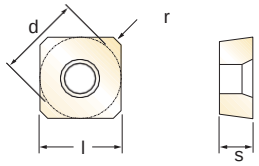


**SEKN_** Ground wiper facet χ 45° one face pressed chip-breaker

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 010832 | SEER 12 03AFEN | 750 | 12,7 | 12,7 | 3,18 | Facet | 0,12 |
| 009252 | SEER 12 03AFEN | A04030 | 12,7 | 12,7 | 3,18 | Facet | 0,12 |
| 009247 | SEER 12 03AFEN | K01 | 12,7 | 12,7 | 3,18 | Facet | 0,12 |
| 017862 | SEER 12 03AFFN | H01 | 12,7 | 12,7 | 3,18 | Facet | 0,12 |
| 010834 | SEER 12 04AFEN | 750 | 12,7 | 12,7 | 4,76 | Facet | 0,12 |
| 009253 | SEER 12 04AFEN | A04030 | 12,7 | 12,7 | 4,76 | Facet | 0,12 |
| 011344 | SEER 15 04AFEN | 750 | 15,88 | 15,88 | 4,76 | Facet | 0,12 |
| 009254 | SEER 15 04AFEN | A04030 | 15,88 | 15,88 | 4,76 | Facet | 0,12 |



**SEER_** Ground wiper facet χ 45° one face pressed chip-breaker.




| EDP# | Part Number | Grade | Dimensions (mm) d | l | s | r | $h_m$ min |
|---|---|---|---|---|---|---|---|
| 010833 | SEKR 12 03AFEN | 750 | 12,7 | 12,7 | 3,18 | Facet | 0,12 |
| 009781 | SEKR 12 03AFEN | A04030 | 12,7 | 12,7 | 3,18 | Facet | 0,12 |
| 017863 | SEKR 12 03AFFN | H01 | 12,7 | 12,7 | 3,18 | Facet | 0,12 |
| 011546 | SEKR 12 04AFEN | 750 | 12,7 | 12,7 | 4,76 | Facet | 0,12 |
| 027898 | SEKR 12 03AFTR | 750S | 12,7 | 12,7 | 4,76 | Facet | 0,12 |
| 017223 | SEKR 12 04AFEN | A04030 | 12,7 | 12,7 | 4,76 | Facet | 0,12 |
| 011345 | SEKR 15 04AFEN | 750 | 15,88 | 15,88 | 4,76 | Facet | 0,12 |
| 010809 | SEKR 15 04AFEN | A04030 | 15,88 | 15,88 | 4,76 | Facet | 0,12 |

**SEKR_-**
Ground wiper facet ϰ 45°
one face pressed chip-breaker.



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 022114 | SEKT 12 04AFER-4T | 750 | 12,7 | 12,7 | 4,76 | Facet | 0,05 |
| 022113 | SEKT 12 04AFER-4T | XT500 | 12,7 | 12,7 | 4,76 | Facet | 0,05 |

**SEKT_-4T**
As pressed circumference with ground wiper facets ϰ 45° with one face pressed chip-breaker.



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 017329 | SEMT13T3AGSN-4T | 750 | 13,4 | 13,4 | 3,97 | Facet | 0,15 |
| 017733 | SEGT13T3AGFN-4T | H01 | 13,4 | 13,4 | 3,97 | Facet | 0,15 |
| 017734 | SEMT13T3AGSN-4T | A04030 | 13,4 | 13,4 | 3,97 | Facet | 0,15 |
| 017732 | SEMT13T3AGSN-4T | 750S | 13,4 | 13,4 | 3,97 | Facet | 0,15 |

**SEMT_4T**
As pressed circumference
one face pressed chip-breaker.



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 000477 | SPKN 12 03EDKR | K01 | 12,7 | 12,7 | 3,18 | Facet | 0,2 |
| 012476 | SPKN 12 03EDKR | 750 | 12,7 | 12,7 | 3,18 | Facet | 0,2 |
| 012476 | SPKN 12 03EDTR | 750 | 12,7 | 12,7 | 3,18 | Facet | 0,15 |
| 012476 | SPKN 12 03EDTR | A04030 | 12,7 | 12,7 | 3,18 | Facet | 0,15 |
| 012476 | SPKN 12 03EDTR | 750S | 12,7 | 12,7 | 3,18 | Facet | 0,15 |
| 012476 | SPKN 12 03EDER | H91 | 12,7 | 12,7 | 3,18 | Facet | 0,15 |

**SPKN_**
As pressed circumference ϰ 45° with ground facet without chip-breaker.



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 024139 | TCMT 16 T308E | 750 | 9,52 | 16,5 | 3,97 | 0,8 | 0,05 |
| 023388 | TCMT 16 T308E | A04030 | 9,52 | 16,5 | 3,97 | 0,8 | 0,05 |
| 017743 | TCMT 16 T308E | 750S | 9,52 | 16,5 | 3,97 | 0,8 | 0,05 |
| 027901 | TCMT 16 T308E | K01 | 9,52 | 16,5 | 3,97 | 0,8 | 0,05 |
| 014852 | TCGT 16 T308E | H01 | 9,52 | 16,5 | 3,97 | 0,8 | 0,07 |

**TCMT_**
As pressed circumference
one face pressed chip-breaker.



# Expanded Cutting Conditions

| ISO | Material | Material Strength | CVD Coated Grades | | | | PVD Coated Grades | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | K01 | XT500 | 750 | A04030 | H01 | 750S | A750S | ST100 |
| | | | Surface Speed Meters per Minute* | | | | | | | |
| P | Unalloyed Steels | <600 N/mm² | | | 350 - 140 | 275 - 135 | | 280 - 150 | 207 - 117 | 260 - 130 |
| | | <600 N/mm² | | | 350 - 120 | 240 - 120 | | 250 - 130 | 183 - 104 | 230 - 115 |
| | Alloyed Steels | 700-950 N/mm² | | 210 - 100 | 270 - 105 | 210 - 105 | 295 - 175 | 240 - 115 | 161 - 91 | 220 - 100 |
| | | 950 - 1200 N/mm² | | 160 - 75 | 200 - 80 | 160 - 80 | 225 - 135 | 190 - 90 | 122 - 69 | 175 - 80 |
| | | 1200 - 1400 N/mm² | | 100 - 50 | | 100 - 50 | 145 - 85 | | 78 - 44 | 110 - 50 |
| M | Stainless Steels | Austenitic + Ferritic | | 240 - 115 | 200 - 120 | 240 - 120 | | 280 - 130 | | 265 - 115 |
| | | Martensitic | | 215 - 100 | 180 - 110 | 220 - 110 | | 250 - 115 | | 235 - 105 |
| | PH Stainless | Refractory P.H. | | 100 - 50 | | 105 - 50 | | 115 - 55 | | 110 - 50 |
| K | Cast Irons | Grey GG-FI | 395 - 150 | | 365 - 145 | | 400 - 240 | 295 - 145 | | |
| | | Spheroidal-Ductile GGG-FGS | 335 - 120 | 220 - 105 | 285 - 115 | 225 - 110 | 315 - 185 | 235 - 115 | | |
| | | Malleable GTS-MN/MP | 275 - 105 | 200 - 100 | 260 - 105 | 205 - 100 | 285 - 170 | 215 - 105 | | |
| N | Aluminium & Alloys | < 16% Silicon | | | | | 1000 - 400 | | | |
| | | > 16% Silicon | | | | | 475 - 275 | | | |
| S | High Temperature Alloys | Iron Based | | 85 - 40 | 70 - 45 | 85 - 45 | | 90 - 45 | | 85 - 40 |
| | | Cobalt Based | | 45 - 20 | 40 - 25 | 45 - 25 | | 50 - 25 | | 45 - 25 |
| | | Nickel Based | | 50 - 25 | 40 - 25 | 45 - 25 | | 55 - 25 | | 50 - 25 |
| | | Titanium Based | | 60 -30 | 50 - 30 | 60 - 30 | | 65 - 30 | | 60 - 30 |
| H | Hard Materials | 48 - 52 HRC | | | | | 60 - 140 | 60 - 140 | 73 - 41 | |
| | | 52 - 56 HRC | | | | | 50 - 100 | 50 - 100 | 61 - 35 | |
| | | 56 - 58 HRC | | | | | 20 - 40 | 20 - 40 | | |
| | Austempered Ductile Iron | 46 - 50 HRC | | | 65 - 40 | | | | | |

*** Surface Speed Meters per Minute**

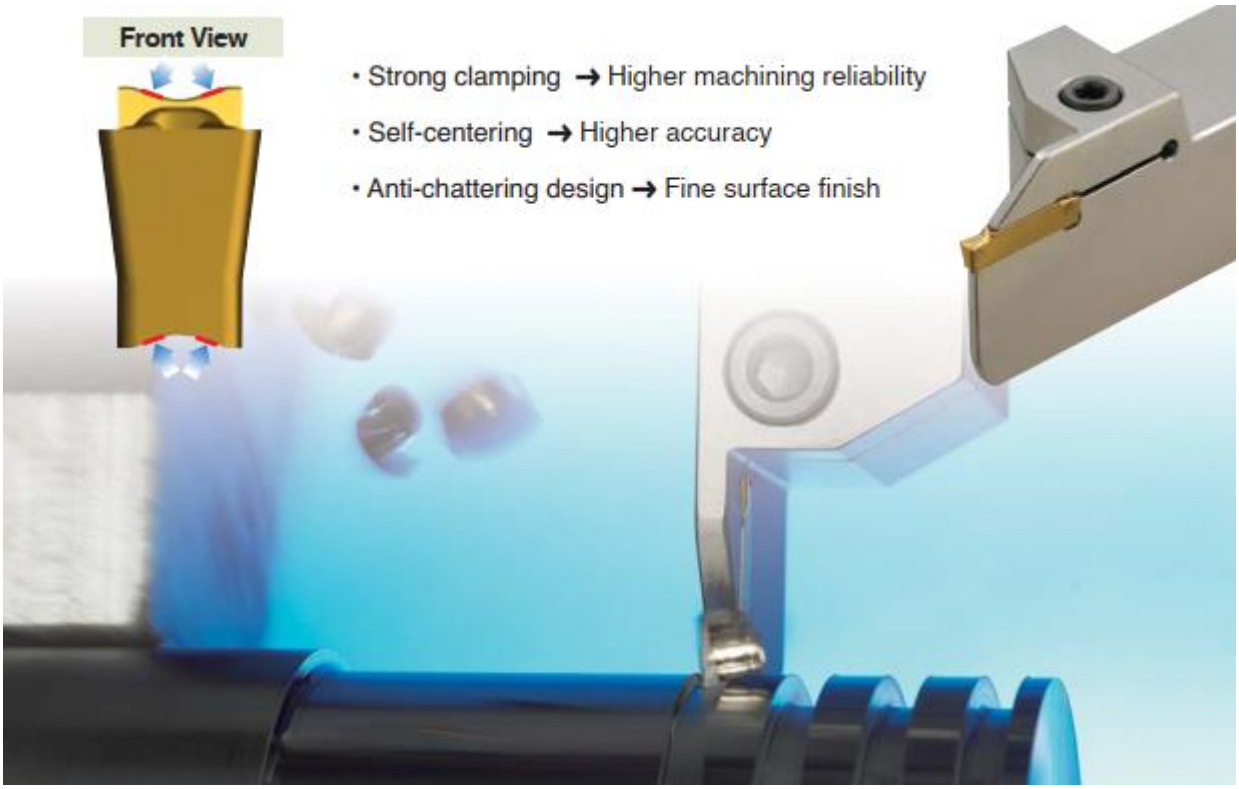
$$\text{Surface speed} = \frac{3.142 \times \text{cutter dia.} \times \text{RPM}}{1000}$$

$$\text{R.P.M.} = \frac{1000 \times \text{surface speed}}{3.142 \times \text{cutter dia.}}$$

## Star Guide — Key to Recommended Tools

| Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

# Turning and Grooving



Two part-off systems are available. The first is a block and blade system with Part-off widths ranging from 0.079" (2mm) to 0.236" (6mm). The second system is designed for Swiss Automatics with part-off ranges from 0.063" (1.6mm) to 0.118" (3mm). Both systems offer neutral, right and left-hand inserts.

## Part-off Grade Description

- 750S – A TiAlN PVD coated grade offering with a sharp edge condition. Ideal for stainless steels and high temperature alloys.
- A04030 – A TiN-TiCN-$Al_2O_3$ CVD coated grade offering good wear resistance.
  Ideal for steels and cast irons.

| Cutting Speed (Vc) SFM | | | Coated | | | |
|---|---|---|---|---|---|---|
| ISO | Material | Rmand Hardness | CVD A04030 | | PVD 750S | |
| | | | Max - | Min | Max - | Min |
| P | Unalloyed Steels | 400 - 600 N/mm² 120 - 180HBN | 1150 | 460 | 1405 | 665 |
| | | 600 - 950 N/mm² 180 - 280HBN | 980 | 395 | 910 | 430 |
| | Alloyed Steels | 700 - 950 N/mm² 200 - 280 HBN | 885 | 330 | 835 | 395 |
| | | 950 - 1200 N/mm² 280 - 355 HBN | 655 | 260 | 760 | 360 |
| | | 1200 - 1400 N/mm² 355 - 415 HBN | - | - | 520 | 245 |
| M | Stainless Steels | Austenitic + Ferritic 300 series | 655 | 395 | 950 | 450 |
| | | Martensitic 400 series | 590 | 360 | 990 | 470 |
| | | Refractory P.H. | - | - | 505 | 240 |
| K | Cast Irons | Grey GG-Ft | 1180 | 460 | 1395 | 660 |
| | | Spheroidal-Ductile GGG-FGS | 920 | 360 | 1205 | 570 |
| | | Malleable GTS - MN/MP | 855 | 330 | 810 | 385 |
| N | Aluminum & Alloys | < 16% Si 116HBN | - | - | 3150 | 1200 |
| | Aluminum & Silicon | > 16% Si92HBN | - | - | - | - |
| S | High Temperature Alloys | Iron Based | - | - | 205 | 95 |
| | | Cobalt Based | - | - | 165 | 80 |
| | | Nickel Based | - | - | 175 | 85 |
| | | Titanium Based | - | - | 280 | 130 |

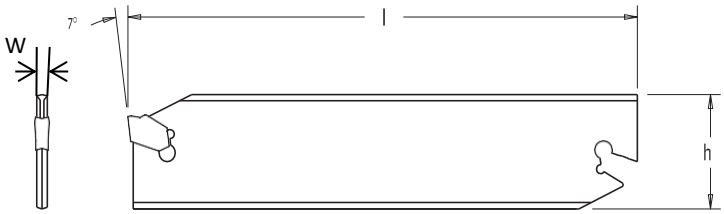
**Cutting Fn : 0.05-0.4 mm/rev**

*Optimum Grade Performance*

| Materials | Code C | Code ISO | Coated CVD GRADE A04030 | Coated PVD GRADE 750S |
|---|---|---|---|---|
| Unalloyed and Alloyed Steels (P) | C8 | P01 | | |
| | | P05 | | |
| | | P10 | | |
| | C7 | P15 | | |
| | | P20 | | |
| | | P25 | | |
| | C6 | P30 | | |
| | | P35 | | |
| | C5 | P40 | | |
| | | P45 | | |
| | | P50 | | |
| Stainless Steels (M) | | M05 | | |
| | | M10 | | |
| | | M15 | | |
| | | M20 | | |
| | | M25 | | |
| | | M30 | | |
| | | M35 | | |
| | | M40 | | |
| Cast Irons (K) | C4 | K01 | | |
| | | K05 | | |
| | C3 | K10 | | |
| | | K15 | | |
| | C2 | K20 | | |
| | | K25 | | |
| | C1 | K30 | | |
| | | K35 | | |
| | | K40 | | |
| Aluminum & Alloys (N) | | N01 | | |
| | | N05 | | |
| | | N10 | | |
| | | N15 | | |
| | | N20 | | |
| | | N25 | | |
| | | N30 | | |
| High Temperature Alloys (S) | | S01 | | |
| | | S05 | | |
| | | S10 | | |
| | | S15 | | |
| | | S20 | | |
| | | S25 | | |
| | | S30 | | |



## Positive Stop Blades

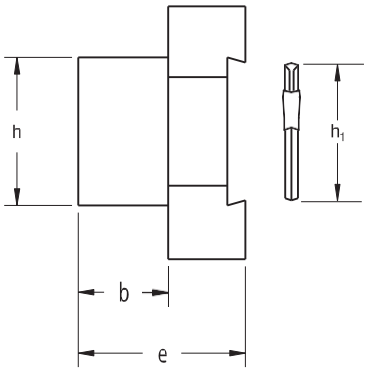



### SPH

| Description | Dimensions (mm ) | | | Inserts |
|---|---|---|---|---|
| | h | l | W | |
| SPH226P | 26 | 110 | 1.6 | TGN_2 |
| SPH326P | 26 | 110 | 2.4 | TGN_3 |
| SPH426P | 26 | 110 | 3.2 | TGN_4 |
| SPH526P | 26 | 110 | 4.0 | TGN_5 |
| SPH626P | 26 | 110 | 5.2 | TGT_6 |
| SPH232P | 32 | 150 | 1.6 | TGN_2 |
| SPH332P | 32 | 150 | 2.4 | TGN_3 |
| SPH432P | 32 | 150 | 3.2 | TGN_4 |
| SPH532P | 32 | 150 | 4.0 | TGN_5 |
| SPH632P | 32 | 150 | 5.2 | TGT_6 |

## Tool Blocks






### TGTB

| Description | Dimensions ( mm ) | | | | Accepts Blades |
|---|---|---|---|---|---|
| | L | b | h | e | |
| SPBN1626 | 86 | 12 | 16 | 30 | SPH26.2/3/4/5/6 |
| SPBN2026 | 86 | 19 | 20 | 38 | SPH26.2/3/4/5/6 |
| SPBN2032 | 100 | 19 | 20 | 38 | SPH32.2/3/4/5/6 |
| SPBN2526 | 86 | 23 | 25 | 42 | SPH26.2/3/4/5/6 |
| SPBN2532 | 110 | 23 | 25 | 42 | SPH32.2/3/4/5/6 |
| SPBN3232 | 110 | 30 | 32 | 48 | SPH32.2/3/4/5/6 |

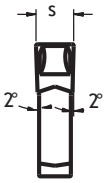
Star Guide  Key to Recommended Tools

| Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|
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| P | Alloyed Steels | M | PH Stainless | N | Aluminium & Alloys | H | Hard Materials |

## TGN Inserts

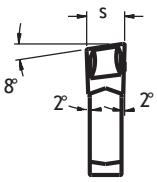


Neutral insert




TGN

LH insert shown




TGNR/L

## TGN,TGNR & TGNL

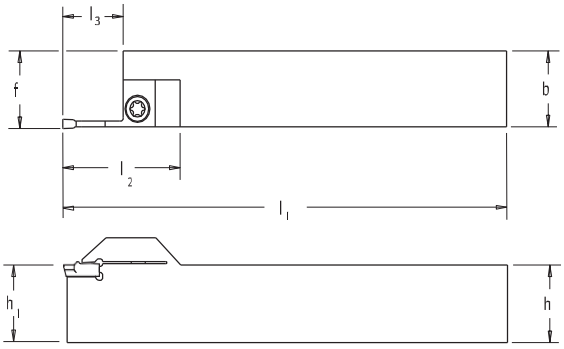
| Description | A4030 | 750S | s |
|---|---|---|---|
| TGN2 | | | 0.087 |
| TGN3 | | | 0.122 |
| TGNR2.8 | | | 0.087 |
| TGNL2.8 | | | 0.122 |
| TGNR3.8 | | | 0.122 |
| TGNL3.8 | | | 0.122 |
| TGN4 | | | 0.161 |
| TGNR4.8 | | | 0.161 |
| TGNL4.8 | | | 0.161 |
| TGN5 | | | 0.200 |
| TGNR5.8 | | | 0.200 |
| TGNL5.8 | | | 0.200 |
| TGTN6 | | | 0.250 |

# Mini Part-Off Toolholders

## STP



R/L Shown




## STPOR

| Description | Dimensions | | | | | | Max. Part-off ø | Inserts Part-Off |
|---|---|---|---|---|---|---|---|---|
| | b | $l_3$ | W | $l_1$ | h | $h_1$ | | |
| STP316R/L | 16 | 16 | 1.6 | 100 | 16 | 16 | 32 | TGN_2.0 |
| STP320R/L | 20 | 20 | 2.4 | 120 | 20 | 20 | 40 | TGN_3.0 |
| STP420R/L | 20 | 25 | 3.2 | 120 | 20 | 20 | 50 | TGN_4.0 |
| STP520R/L | 20 | 30 | 4.0 | 120 | 20 | 20 | 60 | TGN_5.0 |
| STP325R/L | 25 | 25 | 2.4 | 150 | 25 | 25 | 50 | TGN_3.0 |
| STP425R/L | 25 | 30 | 3.2 | 150 | 25 | 25 | 60 | TGN_4.0 |
| STP525R/L | 25 | 35 | 4.0 | 150 | 25 | 25 | 70 | TGN_5.0 |
| STP625R/L | 25 | 40 | 5.2 | 150 | 25 | 25 | 80 | TGN_6.0 |

**NOTE: The part number for these tools are Stellram specific as ISO 5608 does not cater for this type of tool. Available in RIGHT HAND only.**

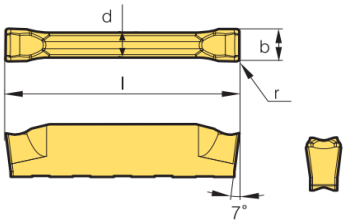
## Star Guide Key to Recommended Inserts

| Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# Part-Off Toolholders

## TGNN Inserts



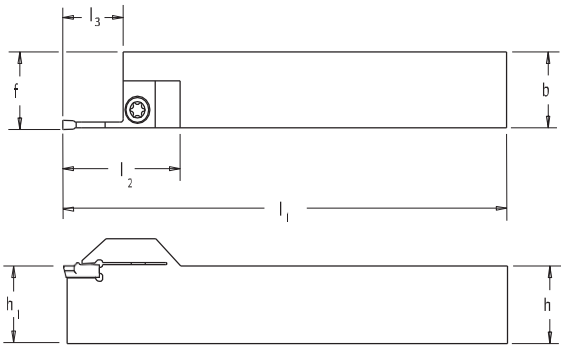



| TGNN | | | | | |
|---|---|---|---|---|---|
| Description | A4030 | 750S | r | b | l |
| TGNN150 | | | 0.15 | 1.5 | 16 |
| TGNN200 | | | 0.2 | 2.0 | 20 |
| TGNN250 | | | 0.2 | 2.5 | 20 |
| TGNN300 | | | 0.4 | 3.0 | 20 |
| TGNN400 | | | 0.4 | 4.0 | 20 |
| TGNN500 | | | 0.8 | 5.0 | 25 |
| TGNN600 | | | 0.8 | 6.0 | 25 |

# Mini Part-Off Toolholders

## ADKT





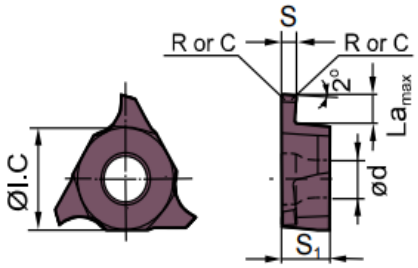

R/L Shown

| STPOR | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Description | Dimensions | | | | | | Max. Part-off ø | Inserts Part-Off |
| | b | $l_3$ | W | $l_1$ | h | $h_1$ | | |
| ADKT1616R/L-TG-1.5-T14 | 16 | 14 | - | - | 16 | 16 | - | TGNN_1.5 |
| ADKT2020R/L-TG-1.5-T14 | 20 | 14 | - | - | 20 | 20 | - | TGNN_1.5 |
| ADKT2525R/L-TG-1.5-T14 | 25 | 14 | - | - | 25 | 25 | - | TGNN_1.5 |
| ADKT1616R/L-TG-2-T15 | 16 | 15 | - | - | 16 | 16 | - | TGNN_2 |
| ADKT2020R/L-TG-2-T15 | 20 | 15 | - | - | 20 | 20 | - | TGNN_2 |
| ADKT2525R/L-TG-2-T15 | 25 | 15 | - | - | 25 | 25 | - | TGNN_2 |
| ADKT1616R/L-TG-2.5-T17 | 16 | 17 | - | - | 16 | 16 | - | TGNN_2.5 |
| ADKT2020R/L-TG-2.5-T17 | 20 | 17 | - | - | 20 | 20 | - | TGNN_2.5 |
| ADKT2525R/L-TG-2.5-T17 | 25 | 17 | - | - | 25 | 25 | - | TGNN_2.5 |
| ADKT1616R/L-TG-3-T22 | 16 | 22 | - | - | 16 | 16 | - | TGNN_3 |
| ADKT2020R/L-TG-3-T22 | 20 | 22 | - | - | 20 | 20 | - | TGNN_3 |
| ADKT2525R/L-TG-3-T22 | 25 | 22 | - | - | 25 | 25 | - | TGNN_3 |
| ADKT2020R/L-TG-4-T22 | 20 | 22 | - | - | 20 | 20 | - | TGNN_4 |
| ADKT2525R/L-TG-4-T25 | 25 | 25 | - | - | 25 | 25 | - | TGNN_4 |
| ADKT3232R/L-TG-4-T30 | 32 | 32 | - | - | 32 | 32 | - | TGNN_4 |
| ADKT2020R/L-TG-5-T22 | 20 | 22 | - | - | 20 | 20 | - | TGNN_5 |
| ADKT2525R/L-TG-5-T25 | 25 | 25 | - | - | 25 | 25 | - | TGNN_5 |
| ADKT3232R/L-TG-5-T32 | 32 | 32 | - | - | 32 | 32 | - | TGNN_5 |
| ADKT2020R/L-TG-6-T22 | 20 | 22 | - | - | 20 | 20 | - | TGNN_6 |
| ADKT2525R/L-TG-6-T30 | 25 | 30 | - | - | 25 | 25 | - | TGNN_6 |
| ADKT3232R/L-TG-6-T35 | 32 | 35 | - | - | 32 | 32 | - | TGNN_6 |
| ADKT4040R/L-TG-6-T35 | 40 | 40 | - | - | 40 | 40 | - | TGNN_6 |

## GBA Inserts



right hand style
Rechtsausführung




R/L Shown

| GBA32 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Description | A04030 | 750S | PH1 | S | La max | R/C | ØI.C | S1 | Ød |
| GBA32R130-R02 | | | | 1.3 | 2.0 | R0.2 | 9.525 | 3.18 | 4.4 |
| GBA32L130-R02 | | | | 1.3 | 2.0 | R0.2 | 9.525 | 3.18 | 4.4 |
| GBA32R140-R02 | | | | 1.4 | 2.0 | R0.2 | 9.525 | 3.18 | 4.4 |
| GBA32R145-R02 | | | | 1.45 | 2.0 | R0.2 | 9.525 | 3.18 | 4.4 |
| GBA32L145-R02 | | | | 1.45 | 2.0 | R0.2 | 9.525 | 3.18 | 4.4 |
| GBA32R150-R02 | | | | 1.50 | 2.0 | R0.2 | 9.525 | 3.18 | 4.4 |
| GBA32R150-R02 | | | | 1.50 | 2.0 | R0.2 | 9.525 | 3.18 | 4.4 |
| GBA32R160-R02 | | | | 1.60 | 2.0 | R0.2 | 9.525 | 3.18 | 4.4 |
| GBA32L160-R02 | | | | 1.60 | 2.0 | R0.2 | 9.525 | 3.18 | 4.4 |
| GBA32R165-R02 | | | | 1.65 | 2.0 | R0.2 | 9.525 | 3.18 | 4.4 |
| GBA32L165-R02 | | | | 1.65 | 2.0 | R0.2 | 9.525 | 3.18 | 4.4 |
| GBA32L170-R02 | | | | 1.7 | 2.0 | R0.2 | 9.525 | 3.18 | 4.4 |
| GBA32R170-R02 | | | | 1.7 | 2.0 | R0.2 | 9.525 | 3.18 | 4.4 |
| GBA32R175-R02 | | | | 1.75 | 2.0 | R0.2 | 9.525 | 3.18 | 4.4 |
| GBA32L175-R02 | | | | 1.75 | 2.0 | R0.2 | 9.525 | 3.18 | 4.4 |
| GBA32R180-R02 | | | | 1.8 | 2.0 | R0.2 | 9.525 | 3.18 | 4.4 |
| GBA32R185-R02 | | | | 1.85 | 2.5 | R0.2 | 9.525 | 3.18 | 4.4 |
| GBA32L185-R02 | | | | 1.85 | 2.5 | R0.2 | 9.525 | 3.18 | 4.4 |

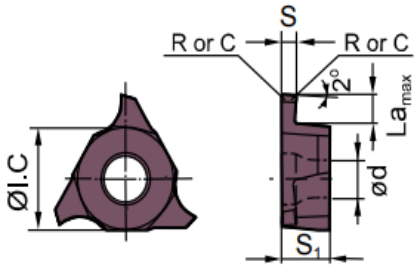
### Star Guide  Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

## GBA Inserts



right hand style
Rechtsausführung




R/L Shown

| GBA32 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Description | A04030 | 750S | PH1 | S | La max | R/C | ØI.C | S1 | Ød |
| GBA32R200-R02 | | | | 2.0 | 2.5 | R0.2 | 9.525 | 3.18 | 4.4 |
| GBA32L200-R02 | | | | 2.0 | 2.5 | R0.2 | 9.525 | 3.18 | 4.4 |
| GBA32R210-R02 | | | | 2.1 | 2.5 | R0.2 | 9.525 | 3.18 | 4.4 |
| GBA32L210-R05 | | | | 2.1 | 2.5 | R0.2 | 9.525 | 3.18 | 4.4 |
| GBA32L220-R02 | | | | 2.2 | 2.5 | R0.2 | 9.525 | 3.18 | 4.4 |
| GBA32R220-R02 | | | | 2.2 | 2.5 | R0.2 | 9.525 | 3.18 | 4.4 |
| GBA32R225-R02 | | | | 2.25 | 2.5 | R0.2 | 9.525 | 3.18 | 4.4 |
| GBA32R250-R02 | | | | 2.5 | 2.5 | R0.2 | 9.525 | 3.18 | 4.4 |
| GBA32L250-R02 | | | | 2.5 | 2.5 | R0.2 | 9.525 | 3.18 | 4.4 |
| GBA32R300-R02 | | | | 3.0 | 3.0 | R0.2 | 9.525 | 3.18 | 4.4 |
| GBA32L300-R02 | | | | 3.0 | 3.0 | R0.2 | 9.525 | 3.18 | 4.4 |

### Star Guide  Key to Recommended Tools

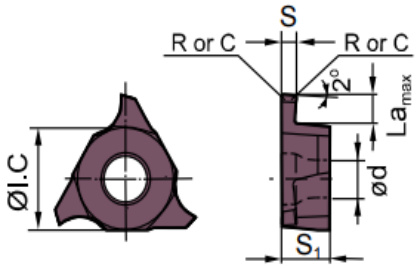
| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

## GBA43 Inserts



right hand style
Rechtsausführung

R/L Shown




| GBA43 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Description | A04030 | 750S | PH1 | S | La max | R/C | ØI.C | S1 | Ød |
| GBA43L100-R02 | | | | 1.00 | 2.00 | R0.2 | 12.70 | 4.76 | 5.5 |
| GBA43R125-R02 | | | | 1.25 | 2.00 | R0.2 | 12.70 | 4.76 | 5.5 |
| GBA43L125-R02 | | | | 1.25 | 2.00 | R0.2 | 12.70 | 4.76 | 5.5 |
| GBA43R145-R02 | | | | 1.45 | 2.00 | R0.2 | 12.70 | 4.76 | 5.5 |
| GBA43L145-R02 | | | | 1.45 | 3.50 | R0.2 | 12.70 | 4.76 | 5.5 |
| GBA43R150-R02 | | | | 1.50 | 3.50 | R0.2 | 12.70 | 4.76 | 5.5 |
| GBA43L150-R02 | | | | 1.50 | 3.50 | R0.2 | 12.70 | 4.76 | 5.5 |
| GBA43R163-R02 | | | | 1.63 | 3.50 | R0.2 | 12.70 | 4.76 | 5.5 |
| GBA43R163-R03 | | | | 1.63 | 3.50 | R0.2 | 12.70 | 4.76 | 5.5 |
| GBA43R175-R02 | | | | 1.75 | 3.50 | R0.2 | 12.70 | 4.76 | 5.5 |
| GBA43L175-R02 | | | | 1.75 | 3.50 | R0.2 | 12.70 | 4.76 | 5.5 |
| GBA43R185-R02 | | | | 1.85 | 3.50 | R0.2 | 12.70 | 4.76 | 5.5 |
| GBA43L185-R02 | | | | 1.85 | 3.50 | R0.2 | 12.70 | 4.76 | 5.5 |
| GBA43R195-R02 | | | | 1.95 | 3.50 | R0.2 | 12.70 | 4.76 | 5.5 |
| GBA43R200-R02 | | | | 2.0 | 3.50 | R0.2 | 12.70 | 4.76 | 5.5 |
| GBA43L200-R02 | | | | 2.0 | 3.50 | R0.2 | 12.70 | 4.76 | 5.5 |
| GBA43R225-R02 | | | | 2.25 | 3.50 | R0.2 | 12.70 | 4.76 | 5.5 |

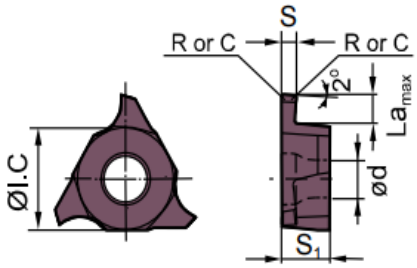
### Star Guide  Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

## GBA43 Inserts



right hand style
Rechtsausführung




R/L Shown

| GBA43 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Description | A04030 | 750S | PH1 | S | La max | R/C | ØI.C | S1 | Ød |
| GBA43R230-R02 | | | | 2.3 | 3.50 | R0.2 | 12.70 | 4.76 | 5.5 |
| GBA43L230-R02 | | | | 2.3 | 3.50 | R0.2 | 12.70 | 4.76 | 5.5 |
| GBA43R250-R03 | | | | 2.5 | 4.00 | R0.3 | 12.70 | 4.76 | 5.5 |
| GBA43L250-R03 | | | | 2.5 | 4.00 | R0.3 | 12.70 | 4.76 | 5.5 |
| GBA43R265-R03 | | | | 2.65 | 4.00 | R0.3 | 12.70 | 4.76 | 5.5 |
| GBA43L265-R03 | | | | 2.65 | 4.00 | R0.3 | 12.70 | 4.76 | 5.5 |
| GBA43R280-R03 | | | | 2.8 | 4.00 | R0.3 | 12.70 | 4.76 | 5.5 |
| GBA43L280-R03 | | | | 2.8 | 4.00 | R0.3 | 12.70 | 4.76 | 5.5 |
| GBA43R300-R03 | | | | 3.0 | 4.00 | R0.3 | 12.70 | 4.76 | 5.5 |
| GBA43L300-R03 | | | | 3.0 | 4.00 | R0.3 | 12.70 | 4.76 | 5.5 |
| GBA43R320-R03 | | | | 3.2 | 4.00 | R0.3 | 12.70 | 4.76 | 5.5 |
| GBA43L320-R03 | | | | 3.2 | 4.00 | R0.3 | 12.70 | 4.76 | 5.5 |
| GBA43R330-R03 | | | | 3.3 | 4.00 | R0.3 | 12.70 | 4.76 | 5.5 |
| GBA43L330-R03 | | | | 3.3 | 4.00 | R0.3 | 12.70 | 4.76 | 5.5 |
| GBA43R350-R03 | | | | 3.5 | 5.00 | R0.3 | 12.70 | 4.76 | 5.5 |
| GBA43L350-R03 | | | | 3.5 | 5.00 | R0.3 | 12.70 | 4.76 | 5.5 |
| GBA43R400-R04 | | | | 4.0 | 5.00 | R0.4 | 12.70 | 4.76 | 5.5 |

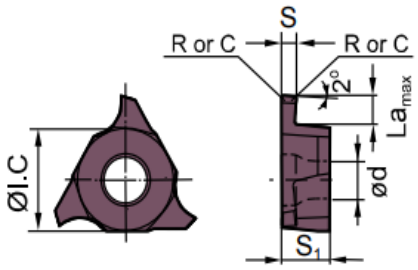
### Star Guide  Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

## GBA43 Inserts



right hand style
Rechtsausführung




R/L Shown

| GBA43 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Description | A04030 | 750S | PH1 | S | La max | R/C | ØI.C | S1 | Ød |
| GBA43L400-R04 | | | | 4.0 | 5.00 | R0.4 | 12.70 | 4.76 | 5.5 |
| GBA43R430-R04 | | | | 4.3 | 5.00 | R0.4 | 12.70 | 4.76 | 5.5 |
| GBA43L430-R04 | | | | 4.3 | 5.00 | R0.4 | 12.70 | 4.76 | 5.5 |
| GBA43R450-R04 | | | | 4.5 | 5.00 | R0.4 | 12.70 | 4.76 | 5.5 |
| GBA43L450-R04 | | | | 4.5 | 5.00 | R0.4 | 12.70 | 4.76 | 5.5 |
| GBA43R480-R04 | | | | 4.8 | 5.00 | R0.4 | 12.70 | 4.76 | 5.5 |
| GBA43L480-R04 | | | | 4.8 | 5.00 | R0.4 | 12.70 | 4.76 | 5.5 |

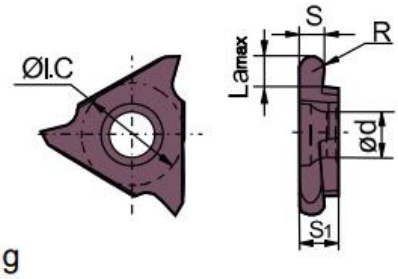
### Star Guide  Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# GBA32..R Round grooving insert



right hand style
Rechtsausführung




R/L Shown

| GBA32...R | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Description | A04030 | 750S | PH1 | S | La max | R/C | ØI.C | S1 | Ød |
| GBA32R100R | | | | 1.0 | 2.0 | 0.50 | 12.70 | 3.18 | 5.5 |
| GBA32R120R | | | | 1.2 | 2.0 | 0.60 | 12.70 | 3.18 | 5.5 |
| GBA32R150R | | | | 1.5 | 2.0 | 0.75 | 12.70 | 3.18 | 5.5 |
| GBA32R200R | | | | 2.0 | 2.5 | 1.0 | 12.70 | 3.18 | 5.5 |
| GBA32L200R | | | | 2.0 | 2.5 | 1.0 | 12.70 | 3.18 | 5.5 |
| GBA32L222R | | | | 2.2 | 2.5 | 1.11 | 12.70 | 3.18 | 5.5 |
| GBA32R222R | | | | 2.2 | 2.5 | 1.11 | 12.70 | 3.18 | 5.5 |
| GBA32R250R | | | | 2.5 | 2.5 | 1.25 | 12.70 | 3.18 | 5.5 |
| GBA32L280R | | | | 2.8 | 2.5 | 1.4 | 12.70 | 3.18 | 5.5 |
| GBA32R280R | | | | 2.8 | 2.5 | 1.4 | 12.70 | 3.18 | 5.5 |
| GBA32R300R | | | | 3.0 | 2.5 | 1.5 | 12.70 | 3.18 | 5.5 |
| GBA32L300R | | | | 3.0 | 2.5 | 1.6 | 12.70 | 3.18 | 5.5 |

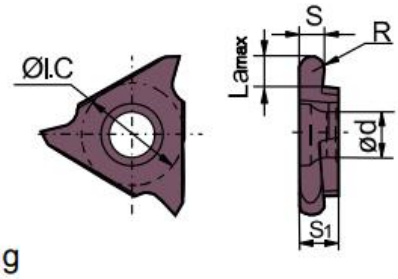
## Star Guide  Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# GBA43..R Round grooving insert



right hand style
Rechtsausführung



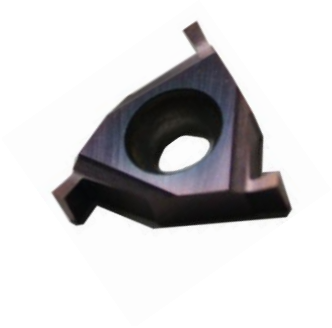

R/L Shown

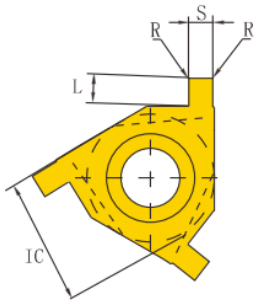
| GBA43..R | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Description | A04030 | 750S | PH1 | S | La max | R/C | ØI.C | S1 | Ød |
| GBA43R100R | | | | 1.0 | 2.0 | 0.5 | 12.70 | 4.76 | 5.5 |
| GBA43L100R | | | | 1.0 | 2.0 | 0.5 | 12.70 | 4.76 | 5.5 |
| GBA43R150R | | | | 1.5 | 3.6 | 0.75 | 12.70 | 4.76 | 5.5 |
| GBA43L150R | | | | 1.5 | 3.6 | 0.75 | 12.70 | 4.76 | 5.5 |
| GBA43R170R | | | | 1.7 | 3.6 | 0.85 | 12.70 | 4.76 | 5.5 |
| GBA43R200R | | | | 2.0 | 3.6 | 1.0 | 12.70 | 4.76 | 5.5 |
| GBA43L200R | | | | 2.0 | 3.6 | 1.0 | 12.70 | 4.76 | 5.5 |
| GBA43R250R | | | | 2.5 | 4.00 | 1.75 | 12.70 | 4.76 | 5.5 |
| GBA43L250R | | | | 2.5 | 4.00 | 1.75 | 12.70 | 4.76 | 5.5 |
| GBA43R300R | | | | 3.0 | 4.00 | 1.5 | 12.70 | 4.76 | 5.5 |
| GBA43L300R | | | | 3.0 | 4.00 | 1.5 | 12.70 | 4.76 | 5.5 |
| GBA43R320R | | | | 3.2 | 4.00 | 1.6 | 12.70 | 4.76 | 5.5 |
| GBA43R400R | | | | 4.0 | 5.00 | 2.0 | 12.70 | 4.76 | 5.5 |
| GBA43L400R | | | | 4.0 | 5.00 | 2.0 | 12.70 | 4.76 | 5.5 |

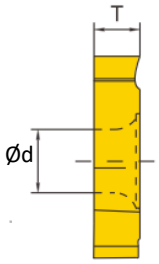
## Star Guide  Key to Recommended Tools

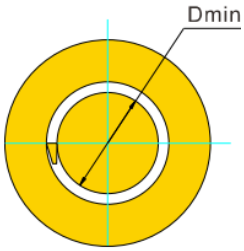
| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# GSR/L grooving insert






R/L Shown

| GSR/L | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Description | A04030 | 750S | PH1 | S | La max | Dmin | R | ØI.C | T | Ød |
| GSR16-150 | | | | 1.5 | 1.8 | 10 | 0.1 | 9.525 | 3.65 | 4.0 |
| **GSR16-200** | | | | 2.0 | 2.2 | 10 | 0.1 | 9.525 | 3.65 | 4.0 |
| **GSR16-250** | | | | 2.5 | 2.2 | 10 | 0.1 | 9.525 | 3.65 | 4.0 |
| GSL16-150 | | | | 1.5 | 1.8 | 10 | 0.1 | 9.525 | 3.65 | 4.0 |
| **GSL16-200** | | | | 2.0 | 2.2 | 10 | 0.1 | 9.525 | 3.65 | 4.0 |
| **GSL16-250** | | | | 2.5 | 2.2 | 10 | 0.1 | 9.525 | 3.65 | 4.0 |
| **GSR22-200** | | | | 2.0 | 3.00 | 15 | 0.1 | 12.70 | 4.76 | 5.0 |
| **GSR22-250** | | | | 2.5 | 3.00 | 15 | 0.1 | 12.70 | 4.76 | 5.0 |
| **GSR22-300** | | | | 3.0 | 3.00 | 15 | 0.1 | 12.70 | 4.76 | 5.0 |
| **GSL22-200** | | | | 2.0 | 3.00 | 15 | 0.1 | 12.70 | 4.76 | 5.0 |
| **GSL22-250** | | | | 2.5 | 3.00 | 15 | 0.1 | 12.70 | 4.76 | 5.0 |
| **GSL22-300** | | | | 3.0 | 3.00 | 15 | 0.1 | 12.70 | 4.76 | 5.0 |

## Star Guide  Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

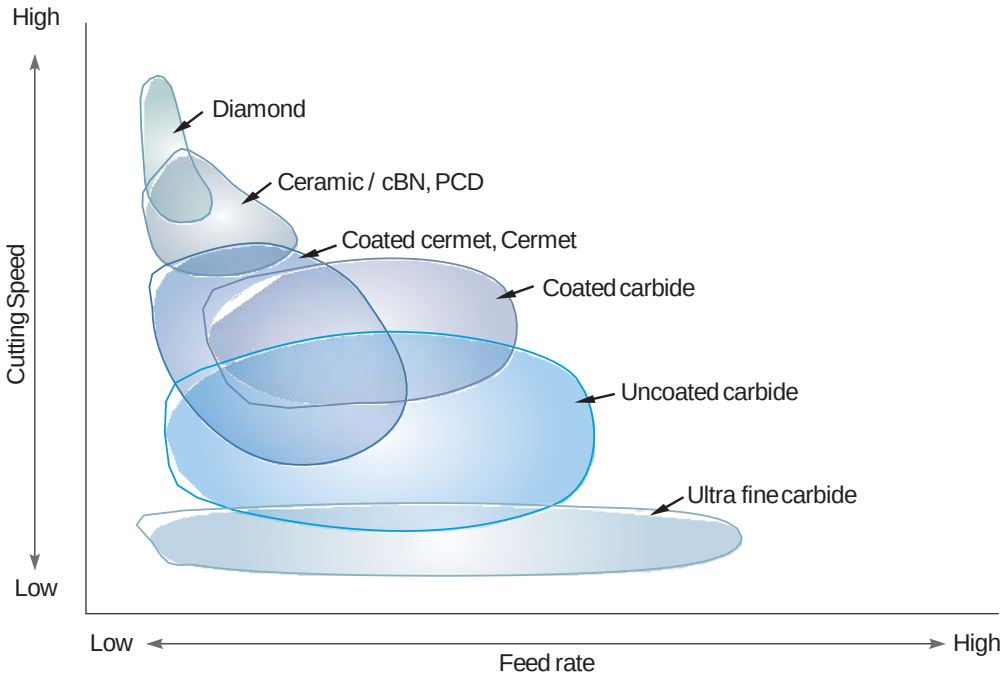
# CERAMICS



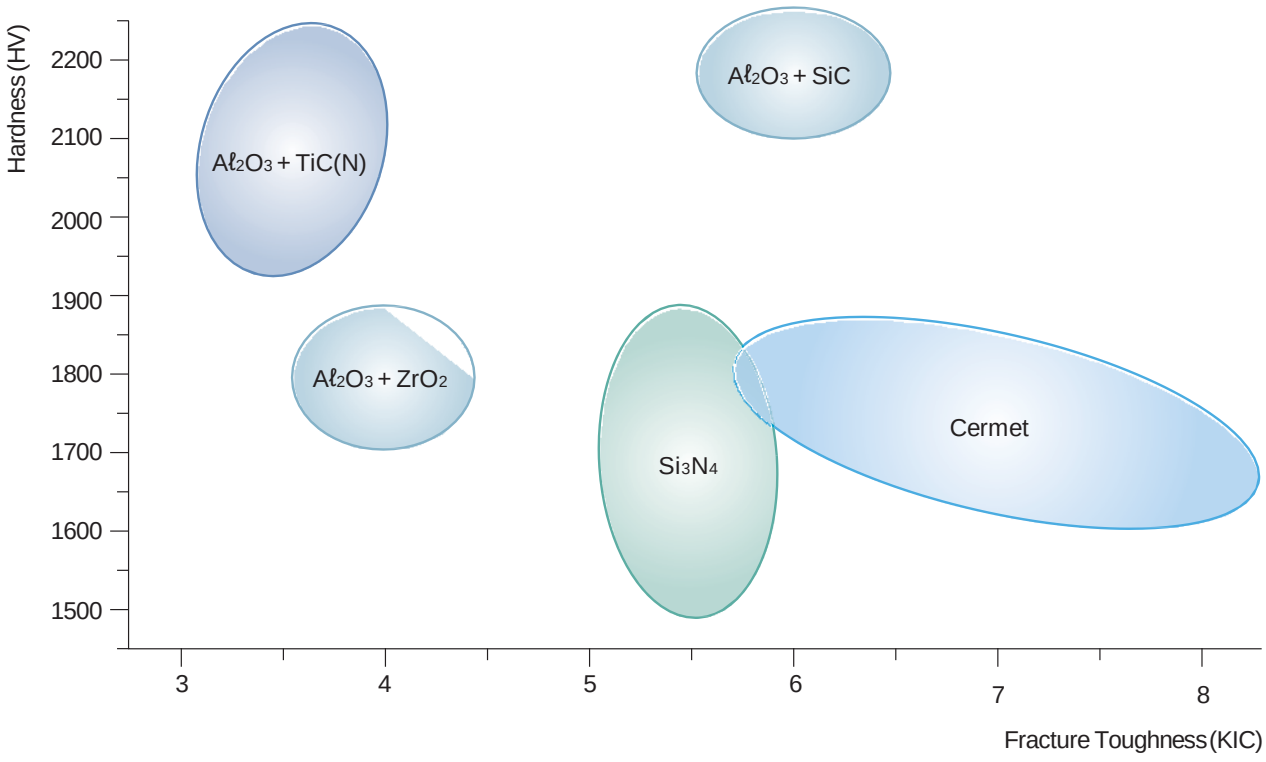
## Grade Information

CERAMIC

| | | |
|---|---|---|
| SiC-Whisker | A400 | High Speed Steel, High Chrome Steel in medium or low speed cutting. Roughing and medium cutting with heavy interruption |
| | A800 | Nickel Base Alloy, Cobalt Base Alloy in high speed cutting. Roughing and finishing with continuous or light interruption |
| $Al_2O_3$+TiC(N) | A1010 | Finishing for hardened steel and cast iron |
| | A3010 | General machining for hardened steel and cast iron |
| | A5010 | Fine finishing for hardened steel and cast iron |
| | A7010 | Fine finishing for hardened steel and cast iron in high speed |
| TiN Coating | A1010C | TiN coated on A1010 grade |
| | A3010C | TiN coated on A3010 grade |
| TiC+$Al_2O_3$ | A2010 | Turning & Milling for ductile cast iron in finish |
| $Al_2O_3$+$ZrO_2$ | A200 | Medium cutting for cast iron |
| | A300 | Medium cutting for high hardness cast iron |
| $Si_3N_4$ | A2020 | Roughing and interrupted cutting for cast iron |
| | A3020 | Roughing and heavy interrupted cutting for cast iron |
| | A4020 | General machining for cast iron |
| | A5020 | Roughing for hard material in high speed |
| | A6020 | Roughing for hard material with interrupted in high speed |
| | A8020(SiAlON) | General machining for high temperature alloy and inconel (Dry) |
| | A9020(SiAlON) | General machining for high temperature alloy and inconel (Wet) |




## Mechanical Properties




## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

## CERAMIC

● Ceramics take pride in its outstanding wear resistance and thermal shock resistance with high speed cutting. Pure raw materials give stability and fine microstructure to the products. Through HIP process, shaped bodies are completely condensed so that the finished goods are strong and resistant against fracture and wear.

- ▶ Improved work efficiency by increasing cutting speed on extremely higher than carbide inserts.
- ▶ Longer tool life through excellent wear resistance
- ▶ Precise cutting and superior surface roughness

| Grade | | Features | Applications | Toughness |
|---|---|---|---|---|
| Whisker | A400 | Excellent flank & notch wear in high speed cutting<br>$A\ell_2O_3$+SiC | High Speed Steel, High Chrome Steel in medium or low speed cutting<br>Roughing and medium cutting with heavy interruption | Tougher ↓ Harder |
| | A800 | Excellent flank & notch wear in high speed cutting<br>$A\ell_2O_3$+SiC | Nickel Base Alloy, Cobalt Base Alloy in high speed cutting<br>Roughing and finishing with continuous or light interruption | |
| $A\ell_2O_3$ Series | A1010 | Tougher alternative to A3010<br>High thermal shock resistance<br>$A\ell_2O_3$+TiC | Universal grade for machining cast iron and hardened steel | Tougher ↓ Harder |
| | A3010 | Excellent wear resistance<br>$A\ell_2O_3$+TiCN | A basic choice for machining hardened steel and alloy steel | |
| | A5010 | Alternative to PCBN<br>fine microstructure<br>$A\ell_2O_3$+TiCN | Fine finishing for hardened steel and cast iron | |
| | A7010 | Excellent wear and thermal shock resistance<br>$A\ell_2O_3$+TiCN | Fine finishing for hardened steel and cast iron in high speed | |
| | A1010C | Wear resistance improved<br>TiN coated | Finishing for hardened steel and cast iron | |
| | A3010C | Excellent wear resistance<br>TiN coated | Finishing for hardened steel and cast iron | |
| | A2010 | High thermal shock resistance<br>Usable with coolant<br>TiC+$A\ell_2O_3$ | Machining ductile cast iron<br>Finishing for ductile cast iron and hard materials | Finishing for ductile cast iron |
| $ZrO_2$ Series | A200 | Toughened by zirconia<br>High chemical stability<br>$A\ell_2O_3$+$ZrO_2$ | Finishing, semi-finishing of cast iron and steel | Tougher ↓ Harder |
| | A300 | Harder alternative to A200<br>$A\ell_2O_3$+$ZrO_2$ | Finishing, semi-finishing of cast iron and steel | |
| $Si_3N_4$ Series | A2020 | Good toughness and thermal shock resistance<br>Well balanced wear resistance and toughness<br>$Si_3N_4$ | First choice for roughing with interrupted cuts<br>Roll turning and milling of cast iron and steel | Roughing in lower speed |
| | A3020 | Tougher alternative to A4020<br>Thermal shock resistance and good toughness<br>$Si_3N_4$ | Roughing and high speed cutting with interruption | Tougher ↓ Harder |
| | A4020 | Excellent wear resistance in high speed cutting<br>$Si_3N_4$ | First choice for roughing of cast iron<br>High speed machining with interrupted cuts | |
| | A5020 | Harder alternative to A4020<br>Improved wear resistance at high cutting speed<br>$Si_3N_4$ | High speed roughing for cast iron | |
| | A6020 | Excellent wear resistance in interrupted cutting<br>$Si_3N_4$ | Roughing for hard material with interruption and high speed | |
| | A8020 | Advanced grade with SiA$\ell$ON contained superior edge strength<br>SiA$\ell$ON | Great performance against notch wear<br>High speed roughing of high temperature alloys and inconel | Harder ↓ Tougher |
| | A9020 | Excellent thermal shock resistance and thermal conductivity<br>SiA$\ell$ON | Tough machining in heat resistance Super alloy (HRSA) | |

# Physical Properties

| Grade | Composition | Color | Density ($g/cm^3$) | Hardness (HV) | Toughness ($MPa \cdot m^{1/2}$) | Thermal Conductivity (cal/cm. sec. ℃) |
|---|---|---|---|---|---|---|
| **A400** | $Al_2O_3$+SiC | Green | 3.80 | 2,100 | 7.00 | - |
| **A800** | $Al_2O_3$+SiC | Green | 3.70 | 2,100 | 7.00 | - |
| **A1010** | $Al_2O_3$+TiC | Black | 4.20 | 2,100 | 4.00 | 0.08 |
| **A3010** | $Al_2O_3$+TiCN | Black | 4.40 | 2,150 | 4.50 | 0.08 |
| **A5010** | $Al_2O_3$+TiCN | Black | 4.30 | 2,200 | 4.50 | 0.08 |
| **A7010** | $Al_2O_3$+TiCN | Black | 4.40 | 2,200 | 4.50 | 0.08 |
| **A1010C** | CAT10+TiN PVD | Gold | 4.20 | 2,150 | 4.00 | - |
| **A3010C** | CAT30+TiN PVD | Gold | 4.40 | 2,200 | 4.50 | - |
| **A2010** | TiC+$Al_2O_3$ | Black | 4.60 | 2,200 | 4.50 | 0.07 |
| **A200** | $Al_2O_3$+$ZrO_2$ | White | 4.00 | 1,800 | 4.50 | 0.07 |
| **A300** | $Al_2O_3$+$ZrO_2$ | Pink | 4.10 | 1,850 | 4.50 | 0.07 |
| **A2020** | $Si_3N_4$ | Black | 3.30 | 1,600 | 5.00 | 0.06 |
| **A3020** | $Si_3N_4$ | Gray | 3.20 | 1,600 | 6.00 | 0.05 |
| **A4020** | $Si_3N_4$ | Gray | 3.20 | 1,650 | 6.00 | 0.05 |
| **A5020** | $Si_3N_4$ | Gray | 3.20 | 1,700 | 6.00 | 0.05 |
| **A6020** | $Si_3N_4$ | Black | 3.20 | 1,700 | 6.50 | 0.07 |
| **A8020** | $Si_3N_4$ | Black | 3.20 | 1,900 | 6.00 | 0.04 |
| **A9020** | $Si_3N_4$ | Gray | 3.22 | 1,600 | 5.00 | 0.07 |

## Star Guide  Key to Recommended Tools

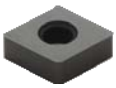
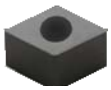
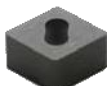
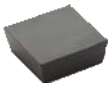
| Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# Choice of Ceramic Grade for Workpiece

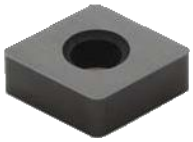
| Application | Grade | Workpiece | | Machining Type | Speed (V) (m/min) | Feed (f) (mm/rev) | Depth (DOC) (mm) |
|---|---|---|---|---|---|---|---|
| Turning | A1010<br>A30 10<br>A5010<br>A7010<br>A1010C<br>A3010C | Gray Cast Iron | Gray Cast Iron (FC)<br>Malleable (FCMB) | Rough<br>Finish | 150 ~ 800<br>200 ~ 1,200 | 0.20 ~0.50<br>0.30 ~0.50 | 3.0 ~6.0<br>0.1 ~0.5 |
| | | | Chilled Cast Iron | Rough<br>Finish | 30 ~100<br>50 ~200 | 0.10 ~0.20<br>0.05 ~0.15 | 0.5 ~1.5<br>0.1 ~0.5 |
| | | Steel | Carbon Steel<br>Alloy Steel<br>Bearing Steel | Rough<br>Finish | 150 ~400<br>200 ~800 | 0.20 ~0.50<br>0.05 ~0.20 | 2.0 ~5.0<br>0.1 ~0.5 |
| | | | Hard Steel (HRC 45≥) | Rough<br>Finish | 20 ~100<br>40 ~200 | 0.10 ~0.20<br>0.05 ~0.50 | 0.5 ~1.5<br>0.1 ~0.5 |
| | A2010 | Ductile Cast Iron<br>Nodular Cast Iron | | Rough<br>Finish | 100 ~400<br>200 ~800 | 0.10 ~0.20<br>0.05 ~0.25 | 1.0 ~2.0<br>0.1 ~0.5 |
| | A200<br>A300 | Gray Cast Iron (FC)<br>Steel (HRC 45≤) | | Rough<br>Finish | 200 ~ 700<br>300 ~ 1,200 | 0.20 ~0.40<br>0.05 ~0.30 | 2.0 ~5.0<br>0.1 ~0.5 |
| | A2020<br>A3020<br>A4020<br>A5020<br>A6020 | Gray Cast Iron | Gray Cast Iron (FC)<br>Malleable (FCMB) | Rough<br>Finish | 150 ~1,100<br>250 ~1,200 | 0.30 ~0.80<br>0.15 ~0.40 | <5.0<br><1.0 |
| | | | Chilled Cast Iron | Rough<br>Finish | 20 ~100<br>60 ~200 | 1.00 ~2.00<br>0.50 ~1.00 | <5.0<br><1.0 |
| | A8020<br>A9020 | Ni-Based Alloy<br>Non-Ferrous Metal<br>Inconel | | Rough<br>Finish | 150 ~250<br>150 ~450 | 0.20 ~0.40<br>0.10 ~0.20 | <5.0<br><1.0 |
| | A400<br>A800 | High temperature alloys<br>Inconel<br>Stellite | | Rough<br>Finish | 180 ~360<br>180 ~450 | 0.10 ~0.25<br>0.10 ~0.30 | 1.0 ~3.0<br>0.5 ~2.0 |
| Milling | A2020<br>A3020<br>A4020<br>A5020<br>A6020 | Gray Cast Iron (FC) | | Rough<br>Finish | 100 ~1,200<br>150 ~1,500 | 0.30 ~0.50<br>0.30 ~0.70 | <5.0<br><3.0 |
| | | Ductile Cast Iron<br>Alloy Steel | | Rough<br>Finish | 90 ~ 500<br>100 ~ 700 | 0.10 ~0.30<br>0.10 ~0.40 | <5.0<br><3.0 |
| | A8020<br>A9020 | High temperature alloys<br>Inconel<br>Stellite | | Finish | 700 ~ 1,000 | 0.05 ~ 0.15 / tooth | 0.5 ~ 2.5 |
| | A400<br>A800 | High temperature alloys<br>Inconel | | Rough | 150 ~ 400 | 0.05 ~ 0.10 / tooth | 1.0 ~ 3.0 |

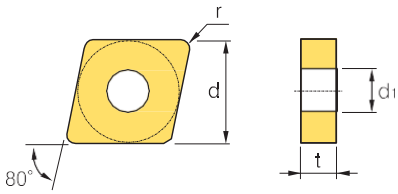
## Star Guide  Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

| CNGA | CNMA | CNGN | CNMN | CNGX | CNVX |
|---|---|---|---|---|---|
|  |  |  |  |  |  |
| **CNMX** | **CNMX .. RD** | **CCGX** | **CCGW** | **CPGN** | **DNGA** |
|  |  |  |  |  |  |
| **DNMA** | **DNGN** | **DNGX** | **DNMX** | **DCGX** | **ENGN** |
|  |  |  |  |  |  |
| **RNGA** | **RNGN** | **RPGA** | **RPGN** | **RPGX .. DP** | **RNGX .. DP** |
|  |  |  |  |  |  |
| **RBGN** | **RCGN** | **SNGA** | **SNMA** | **SNGN** | **SNGX** |
|  |  |  |  |  |  |
| **SNMX** | **SNMX .. RD** | **SCGN** | **SCGX** | **SCGW** | **SPGN** |
|  |  |  |  |  |  |
| **TNGA** | **TNGN** | **TCUN** | **TPGN** | **TPUN** | **VNGA** |
|  |  |  |  |  |  |
| **VNGN** | **VNGX** | **WNGA** | **WNGX** | **CDH** | **F-Series** |
|  |  |  |  |  |  |
| **F-Series** | **F-Series** | **F-Series** | **LNJ** | **SNGN3812R** | **RBGX** |
|  |  |  |  |  |  |
| **RCGX** | **RPGX** | **RXGX** | | | |
|  |  |  | | | |

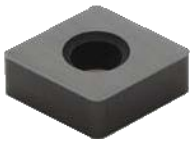
# CNGA

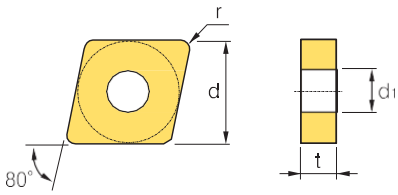





| Type | | Grades | | | | | | | | | | | | | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r | d1 |
| CNGA 120404 | CNGA 431 | ● | ○ | ● | ○ | ○ | | | | | ○ | | | | | ○ | | | | 12.70 | 4.76 | 0.4 | 5.16 |
| CNGA 120408 | CNGA 432 | ● | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ | | ○ | ○ | 12.70 | 4.76 | 0.8 | 5.16 |
| CNGA 120412 | CNGA 433 | ● | ○ | ● | | | | | ○ | | ○ | ○ | ● | ○ | ○ | ○ | | ○ | ○ | 12.70 | 4.76 | 1.2 | 5.16 |
| CNGA 120416 | CNGA 434 | ○ | ○ | ○ | | | | | | | ○ | ○ | ○ | | | ○ | | ○ | ○ | 12.70 | 4.76 | 1.6 | 5.16 |
| CNGA 120704 | CNGA 451 | | | | | | | | | | | | | | | | | | | 12.70 | 7.94 | 0.4 | 5.16 |
| CNGA 120708 | CNGA 452 | ○ | | ○ | | | | | | | ○ | ○ | | | | | | | | 12.70 | 7.94 | 0.8 | 5.16 |
| CNGA 120712 | CNGA 453 | ○ | | ○ | ○ | | | | | | ○ | ○ | | | | ○ | | ○ | ○ | 12.70 | 7.94 | 1.2 | 5.16 |
| CNGA 120716 | CNGA 454 | ○ | | | | | | | | | ○ | ○ | | | | ○ | | | | 12.70 | 7.94 | 1.6 | 5.16 |
| CNGA 160608 | CNGA 542 | | | | | | | | | | ○ | | | | | | | | | 15.87 | 6.35 | 0.8 | 6.35 |
| CNGA 160612 | CNGA 543 | | | | | | | | | | ○ | ○ | | | | | | ○ | ○ | 15.87 | 6.35 | 1.2 | 6.35 |
| CNGA 160616 | CNGA 544 | ○ | | | | | | | | | | | | | | | | | | 15.87 | 6.35 | 1.6 | 6.35 |
| CNGA 160708 | CNGA 552 | ○ | | ○ | | | | | | | | | | | | | | | | 15.87 | 7.94 | 0.8 | 6.35 |
| CNGA 160712 | CNGA 553 | ○ | | ○ | | | | | | | | ○ | | | | | | | | 15.87 | 7.94 | 1.2 | 6.35 |
| CNGA 160716 | CNGA 554 | | | | | | | | | | | ○ | | | | | | | | 15.87 | 7.94 | 1.6 | 6.35 |
| CNGA 190608 | CNGA 642 | ○ | | | | | | | | | ○ | ○ | | | | ○ | | | | 19.05 | 6.35 | 0.8 | 7.93 |
| CNGA 190612 | CNGA 643 | | | | | | | | | | ○ | | | | | | | ○ | ○ | 19.05 | 6.35 | 1.2 | 7.93 |
| CNGA 190616 | CNGA 644 | ○ | | ○ | | | | | | | | | | | | | | | | 19.05 | 6.35 | 1.6 | 7.93 |
| CNGA 190712 | CNGA 653 | | | | | | | | | | | | | | | | | | | 19.05 | 7.94 | 1.2 | 7.93 |
| CNGA 190716 | CNGA 654 | ○ | | | | | | | | | | | | | | | | | | 19.05 | 7.94 | 1.6 | 7.93 |

# CNMA



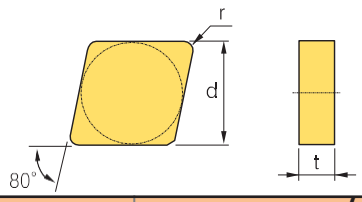



| Type | | Grades | | | | | | | | | | | | | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r | d1 |
| CNMA 120408 | CNMA 432 | | | | | | | | | | | ○ | ○ | | | | | | | 12.70 | 4.76 | 0.8 | 5.16 |
| CNMA 120412 | CNMA 433 | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | | | | 12.70 | 4.76 | 1.2 | 5.16 |
| CNMA 120416 | CNMA 434 | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | | | | 12.70 | 4.76 | 1.6 | 5.16 |
| CNMA 160612 | CNMA 543 | | | | | | | | | | | | ○ | | ○ | | | | | 15.87 | 6.35 | 1.2 | 6.35 |
| CNMA 160616 | CNMA 544 | | | | | | | | | | | | ○ | | ○ | | | | | 15.87 | 6.35 | 1.6 | 6.35 |

## Star Guide Key to Recommended Tools

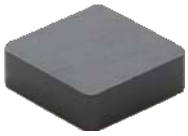
| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

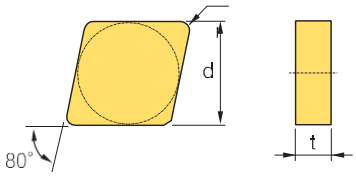





| Type | | Grades | | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| CNGN 090304 | CNGN 321 | | | ○ | | | | | | | | | | | | | | | | 9.52 | 3.18 | 0.4 |
| CNGN 090308 | CNGN 322 | | | | ○ | | | | | | | | | ○ | ○ | | | | | 9.52 | 3.18 | 0.8 |
| CNGN 090312 | CNGN 323 | | | | | | | | | | | | | ○ | ○ | | | | | 9.52 | 3.18 | 1.2 |
| CNGN 120304 | CNGN 421 | ○ | | | | | | | | | | | | | | | | | | 12.70 | 3.18 | 0.4 |
| CNGN 120308 | CNGN 422 | ○ | | | | | | | | | | | | | | | | | | 12.70 | 3.18 | 0.8 |
| CNGN 120312 | CNGN 423 | ○ | | | | | | | | | | | | | | | | | | 12.70 | 3.18 | 1.2 |
| CNGN 120404 | CNGN 431 | ● | ○ | ● | | | | | ○ | | | | | | | | | | | 12.70 | 4.76 | 0.4 |
| CNGN 120408 | CNGN 432 | ● | ○ | ● | ○ | ○ | | ○ | ○ | ○ | ○ | | ● | ○ | | ○ | | ○ | ○ | 12.70 | 4.76 | 0.8 |
| CNGN 120412 | CNGN 433 | ● | ○ | ● | ○ | ○ | | | ○ | | ○ | | ● | ○ | ○ | ○ | | ○ | ○ | 12.70 | 4.76 | 1.2 |
| CNGN 120416 | CNGN 434 | ○ | ○ | ○ | ○ | | | | | | ○ | | ○ | ○ | ○ | ○ | | ○ | ○ | 12.70 | 4.76 | 1.6 |
| CNGN 120704 | CNGN 451 | | | | | | | | | | | | | | | | | ○ | ○ | 12.70 | 7.94 | 0.4 |
| CNGN 120708 | CNGN 452 | | | | | | | | | | ○ | ○ | | | ○ | | | | | 12.70 | 7.94 | 0.8 |
| CNGN 120712 | CNGN 453 | ○ | ○ | | | | | | | | ○ | | ○ | ○ | ○ | | | ○ | ○ | 12.70 | 7.94 | 1.2 |
| CNGN 120716 | CNGN 454 | ○ | ○ | | | | | | | | ○ | | ○ | ○ | ○ | | | ○ | ○ | 12.70 | 7.94 | 1.6 |
| CNGN 160608 | CNGN 542 | | | | | | | | | | | | | | | | | | | 15.87 | 6.35 | 0.8 |
| CNGN 160612 | CNGN 543 | ○ | | | | | | | | | | | ○ | | | | | ○ | ○ | 15.87 | 6.35 | 1.2 |
| CNGN 160616 | CNGN 544 | ○ | | | | | | | | | | | | | | | | | | 15.87 | 6.35 | 1.6 |
| CNGN 160708 | CNGN 552 | ○ | | | | | | | | | | | ○ | | | | | | | 15.87 | 7.94 | 0.8 |
| CNGN 160712 | CNGN 553 | ○ | | ○ | ○ | | | | | | ○ | | ○ | ○ | | | | | | 15.87 | 7.94 | 1.2 |
| CNGN 160716 | CNGN 554 | ○ | ○ | ○ | ○ | | | | | | ○ | ○ | | | | | | | | 15.87 | 7.94 | 1.6 |
| CNGN 160720 | CNGN 555 | ○ | | | | | | | | | ○ | ○ | | | | | | | | 15.87 | 7.94 | 2.0 |
| CNGN 190612 | CNGN 643 | ○ | | ○ | | | | | | | | | | | | | | | | 19.05 | 6.35 | 1.2 |
| CNGN 190616 | CNGN 644 | ○ | | ○ | | | | | | | | | | | | | | | | 19.05 | 6.35 | 1.6 |
| CNGN 190712 | CNGN 653 | ○ | | ○ | | | | | | | | | | | | | | | | 19.05 | 7.94 | 1.2 |
| CNGN 190716 | CNGN 654 | ○ | | ○ | | | | | | | | | | | | | | | | 19.05 | 7.94 | 1.6 |
| CNGN 190720 | CNGN 655 | ○ | | | | | | | | | | | | | | | | | | 19.05 | 7.94 | 2.0 |
| CNGN 250724 | CNGN 856 | ○ | | | | | | | | | | | | | | | | | | 25.40 | 7.94 | 2.4 |
| CNGN 250924 | CNGN 866 | ○ | | ○ | | | | | | | ○ | | | | | | | | | 25.40 | 9.52 | 2.4 |

# CNMN

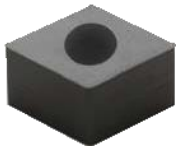


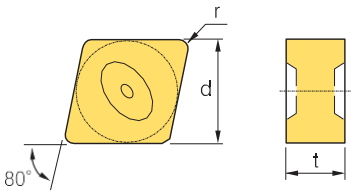



| Type | | Grades | | | | | | | | | | | | | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r | d1 |
| CNMN 120412 | CNMN 433 | | | | | | | | | | | | | | | | | | | 12.70 | 4.76 | 0.8 | 5.16 |
| CNMN 120416 | CNMN 434 | | | | | | | | | | | | | | | | | | | 12.70 | 4.76 | 1.2 | 5.16 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

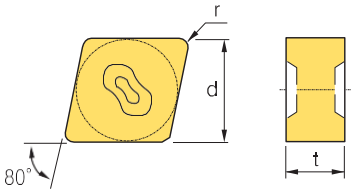





| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| CNGX 120412 | CNGX 433 | | | | | | | | | | | ○ | ○ | | | | | | | 12.70 | 4.76 | 1.2 |
| CNGX 120416 | CNGX 434 | | | | | | | | | | | | ○ | | | | | | | 12.70 | 4.76 | 1.6 |
| CNGX 120708 | CNGX 452 | ○ | | ○ | | | | | | | | ○ | | | | | | | | 12.70 | 7.94 | 0.8 |
| CNGX 120712 | CNGX 453 | ○ | | ○ | | | | | | | | ○ | ○ | ○ | | | | | | 12.70 | 7.94 | 1.2 |
| CNGX 120716 | CNGX 454 | ○ | | ○ | | | | | | | | ○ | ○ | ○ | ○ | | | | | 12.70 | 7.94 | 1.6 |
| CNGX 160708 | CNGX 552 | | | | | | | | | | | ○ | | | | | | | | 15.87 | 7.94 | 0.8 |
| CNGX 160712 | CNGX 553 | | | | | | | | | | | ○ | ○ | ○ | | | | | | 15.87 | 7.94 | 1.2 |
| CNGX 160716 | CNGX 554 | | | | | | | | | | | ○ | ○ | | | | | | | 15.87 | 7.94 | 1.6 |

# CNVX

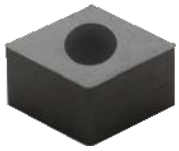


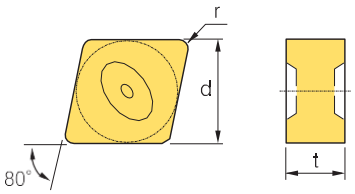



| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| CNVX 120412 | CNVX 433 | | | | | | | | | | | ○ | | | | | | | | 12.70 | 4.76 | 1.2 |
| CNVX 120416 | CNVX 434 | | | | | | | | | | | ○ | | | | | | | | 12.70 | 4.76 | 1.6 |
| CNVX 120708 | CNVX 452 | ○ | | | | | | ○ | | | ○ | | | | | | | | | 12.70 | 7.94 | 0.8 |
| CNVX 120712 | CNVX 453 | ○ | | ○ | | | | ○ | | | ○ | ○ | ○ | ○ | ○ | | | | | 12.70 | 7.94 | 1.2 |
| CNVX 120716 | CNVX 454 | | | ○ | | ○ | | ○ | | | ○ | ○ | ○ | ○ | ○ | | | | | 12.70 | 7.94 | 1.6 |
| CNVX 160708 | CNVX 552 | | | | | | | | | | | | | | | | | | | 15.87 | 7.94 | 0.8 |
| CNVX 160712 | CNVX 553 | | | | | | | | | | | | | | | | | | | 15.87 | 7.94 | 1.2 |
| CNVX 160716 | CNVX 554 | | | | | | | | | | | | | | | | | | | 15.87 | 7.94 | 1.6 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

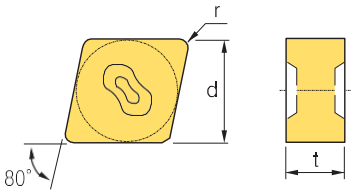





| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| CNGX 120412 | CNGX 433 | | | | | | | | | | | ○ | ○ | | | | | | | 12.70 | 4.76 | 1.2 |
| CNGX 120416 | CNGX 434 | | | | | | | | | | | | ○ | | | | | | | 12.70 | 4.76 | 1.6 |
| CNGX 120708 | CNGX 452 | ○ | | ○ | | | | | | | | ○ | | | | | | | | 12.70 | 7.94 | 0.8 |
| CNGX 120712 | CNGX 453 | ○ | | ○ | | | | | | | | ○ | ○ | ○ | | | | | | 12.70 | 7.94 | 1.2 |
| CNGX 120716 | CNGX 454 | ○ | | ○ | | | | | | | | ○ | ○ | ○ | ○ | | | | | 12.70 | 7.94 | 1.6 |
| CNGX 160708 | CNGX 552 | | | | | | | | | | | ○ | | | | | | | | 15.87 | 7.94 | 0.8 |
| CNGX 160712 | CNGX 553 | | | | | | | | | | | ○ | ○ | ○ | | | | | | 15.87 | 7.94 | 1.2 |
| CNGX 160716 | CNGX 554 | | | | | | | | | | | ○ | ○ | | | | | | | 15.87 | 7.94 | 1.6 |

# CNVX



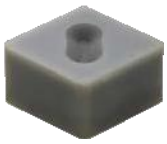


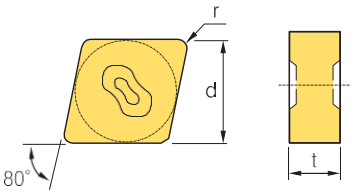

| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| CNVX 120412 | CNVX 433 | | | | | | | | | | | | ○ | | | | | | | 12.70 | 4.76 | 1.2 |
| CNVX 120416 | CNVX 434 | | | | | | | | | | | | ○ | | | | | | | 12.70 | 4.76 | 1.6 |
| CNVX 120708 | CNVX 452 | ○ | | | | | | | ○ | | | ○ | | | | | | | | 12.70 | 7.94 | 0.8 |
| CNVX 120712 | CNVX 453 | ○ | | ○ | | | | | ○ | | | ○ | ○ | ○ | ○ | ○ | | | | 12.70 | 7.94 | 1.2 |
| CNVX 120716 | CNVX 454 | | | ○ | | ○ | | | ○ | | | ○ | ○ | ○ | ○ | ○ | | | | 12.70 | 7.94 | 1.6 |
| CNVX 160708 | CNVX 552 | | | | | | | | | | | | | | | | | | | 15.87 | 7.94 | 0.8 |
| CNVX 160712 | CNVX 553 | | | | | | | | | | | | | | | | | | | 15.87 | 7.94 | 1.2 |
| CNVX 160716 | CNVX 554 | | | | | | | | | | | | | | | | | | | 15.87 | 7.94 | 1.6 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CNMX

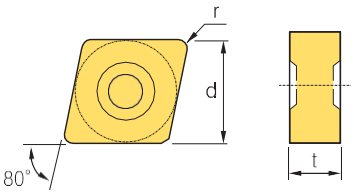





| Type | | Grades | | | | | | | | | | | | | | | | Dimensions(mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| CNMX 120712 | CNMX 453 | | | | | | | | | | | | | | | | | | | 12.70 | 7.94 | 1.2 |
| CNMX 120716 | CNMX 454 | | | | | | | | | | | | | | | | | | | 12.70 | 7.94 | 1.6 |

# CNMX..RD

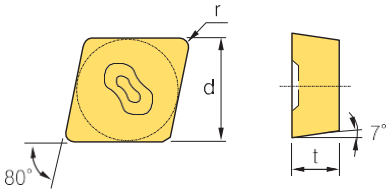





| Type | | Grades | | | | | | | | | | | | | | | | Dimensions(mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| CNMX 120716 RD | CNMX 454 RD | | | | | | | | | | | | | | | | | | | 12.70 | 7.94 | 1.6 |
| | | | | | | | | | | | | | | | | | | | | | | |

# CCGX



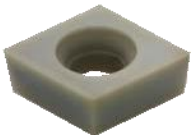


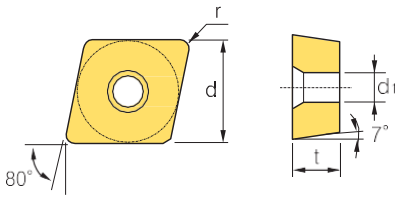

| Type | | Grades | | | | | | | | | | | | | | | | Dimensions(mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| CCGX 120608 | CCGX 442 | | | | | | | | | | | | | | | | | | | 12.70 | 46.35 | 0.8 |
| CCGX 120612 | CCGX 443 | | | | | | | | | | | | | | | | | | | 12.70 | 46.35 | 1.2 |
| CCGX 120616 | CCGX 444 | | | | | | | | | | | | | | | | | | | 12.70 | 46.35 | 1.6 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CCGW

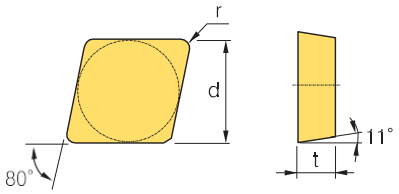





| Type | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r | d1 |
| CCGW 09T304 | ○ | | | | | | | | | ○ | ○ | | | | | | | | 9.52 | 3.97 | 0.4 | 4.40 |
| CCGW 09T308 | ○ | | | | | | | | | ○ | ○ | | ○ | | | | | | 9.52 | 3.97 | 0.8 | 4.40 |
| CCGW 09T312 | | | | | | | | | | ○ | ○ | | ○ | | | | | | 9.52 | 3.97 | 1.2 | 4.40 |
| CCGW 120408 | | | | | | | | | | | ○ | | | | | | | | 12.70 | 4.76 | 0.8 | 5.50 |
| CCGW 120412 | | | | | | | | | | | ○ | | | | | | | | 12.70 | 4.76 | 1.2 | 5.50 |

# CPGN

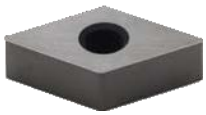


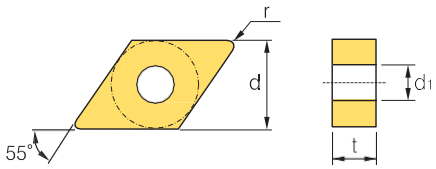



| Type | | Grades | | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| CPGN 090304 | CPGN 321 | | | | | | | | | | | | | | | | | ○ | ○ | 9.52 | 3.18 | 0.4 |
| CPGN 090308 | CPGN 322 | | | | | | | | | | | | | | | | | ○ | ○ | 9.52 | 3.18 | 0.8 |
| CPGN 120408 | CPGN 432 | | ○ | | | | | | | | | | | | | | | ○ | ○ | 12.70 | 4.76 | 0.8 |
| CPGN 120412 | CPGN 433 | | | | | | | | | | | | | | | | | | | 12.70 | 4.76 | 1.2 |
| CPGN 120416 | CPGN 434 | | | | | | | | | | | | | | | | | | | 12.70 | 4.76 | 1.6 |

## Star Guide Key to Recommended Tools

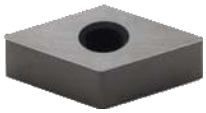
| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

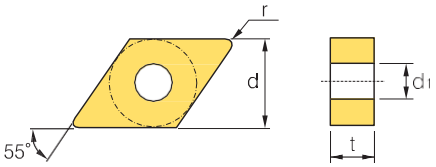





| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r | d1 |
| DNGA 150404 | DNGA 431 | ● | | ● | | ○ | | | | | | | | | | | | | | 12.70 | 4.76 | 0.4 | 5.16 |
| DNGA 150408 | DNGA 432 | ● | | ● | ○ | ○ | | ○ | | | ○ | ○ | ○ | | | | | ○ | ○ | 12.70 | 4.76 | 0.8 | 5.16 |
| DNGA 150412 | DNGA 433 | ● | | ● | ○ | ○ | | | | | | ○ | ○ | ○ | | ○ | | ○ | ○ | 12.70 | 4.76 | 1.2 | 5.16 |
| DNGA 150416 | DNGA 434 | ○ | | | | | | | | | ○ | | | | | | | ○ | ○ | 12.70 | 4.76 | 1.6 | 5.16 |
| DNGA 150604 | DNGA 441 | ● | ○ | ● | ○ | ○ | | | | ○ | | | | | | | | | | 12.70 | 6.35 | 0.4 | 5.16 |
| DNGA 150608 | DNGA 442 | ● | ○ | ● | ○ | ○ | | | | | ○ | | ● | | | | | | | 12.70 | 6.35 | 0.8 | 5.16 |
| DNGA 150612 | DNGA 443 | ● | | ● | ○ | ○ | | | | | ○ | | ● | ○ | | ○ | | | | 12.70 | 6.35 | 1.2 | 5.16 |
| DNGA 150616 | DNGA 444 | ○ | | ○ | ○ | | | | | | | | | | | | | | | 12.70 | 6.35 | 1.6 | 5.16 |
| DNGA 150704 | DNGA 451 | ○ | | ○ | | | | | | | | | | | | | | | | 12.70 | 7.94 | 0.4 | 5.16 |
| DNGA 150708 | DNGA 452 | ○ | | ○ | | | | | | ○ | ○ | ○ | ○ | | | | | | | 12.70 | 7.94 | 0.8 | 5.16 |
| DNGA 150712 | DNGA 453 | ○ | | ○ | | | | | | ○ | | ○ | ○ | ○ | | ○ | | | | 12.70 | 7.94 | 1.2 | 5.16 |
| DNGA 150716 | DNGA 454 | | | | | | | | | | | | | | | | | | | 12.70 | 7.94 | 1.6 | 5.16 |
| DNGA 190608 | DNGA 542 | ○ | | ○ | | | | | | | | | | | | | | | | 15.87 | 6.35 | 0.8 | 6.35 |
| DNGA 190612 | DNGA 543 | ○ | | ○ | | | | | | ○ | ○ | | ○ | | | ○ | | | | 15.87 | 6.35 | 1.2 | 6.35 |
| DNGA 190616 | DNGA 544 | ○ | | | | | | | | | | | | | | | | | | 15.87 | 6.35 | 1.6 | 6.35 |

# DNMA





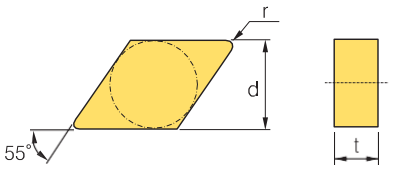

| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r | d1 |
| DNMA 150612 | DNMA 443 | | | | | | | | | | | | | | | | | | | 12.70 | 6.35 | 1.2 | 5.16 |
| DNMA 150616 | DNMA 444 | | | | | | | | | | | | | | | | | | | 12.70 | 6.35 | 1.6 | 5.16 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# DNGN

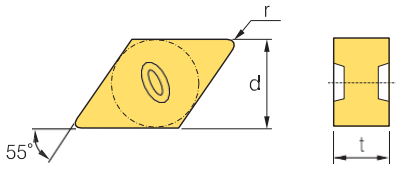





| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| DNGN 150404 | DNGN 431 | ● | | | | | | | | | | | ● | | | | | ○ | ○ | 12.70 | 4.76 | 0.4 |
| DNGN 150408 | DNGN 432 | ● | ○ | | | | | | | | ○ | | ● | | | | | ○ | ○ | 12.70 | 4.76 | 0.8 |
| DNGN 150412 | DNGN 433 | | | | | | | | | | | | | | | | | ○ | ○ | 12.70 | 4.76 | 1.2 |
| DNGN 150416 | DNGN 434 | | | | | | | | | | | | | | | | | | | 12.70 | 4.76 | 1.6 |
| DNGN 150604 | DNGN 441 | ○ | | | | ○ | | | | | | | ○ | | | ○ | | | | 12.70 | 6.35 | 0.4 |
| DNGN 150608 | DNGN 442 | ○ | | | | ○ | | | | | | | ○ | | | ○ | | | | 12.70 | 6.35 | 0.8 |
| DNGN 150612 | DNGN 443 | | | | | | | | | | | | | | | | | | | 12.70 | 6.35 | 1.2 |
| DNGN 150616 | DNGN 444 | ○ | | ○ | | | | | | | | | | | | | | | | 12.70 | 6.35 | 1.6 |
| DNGN 150704 | DNGN 451 | ○ | | ○ | ○ | ○ | | | ○ | ○ | ○ | ○ | | | | ○ | | | | 12.70 | 7.94 | 0.4 |
| DNGN 150708 | DNGN 452 | ○ | | ○ | ○ | ○ | | | ○ | ○ | ○ | ○ | ○ | | | ○ | | | | 12.70 | 7.94 | 0.8 |
| DNGN 150712 | DNGN 453 | ○ | | ○ | | | | | ○ | | ○ | ○ | ○ | | | ○ | | | | 12.70 | 7.94 | 1.2 |
| DNGN 150716 | DNGN 454 | | | | | | | | | | | | | | | | | | | 12.70 | 7.94 | 1.6 |

# DNGX





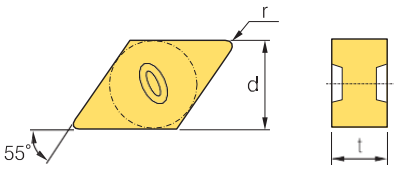

| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| DNGX 120708 | DNGX 352 | | | | | | | | ○ | | | | ○ | | | | | | | 10.00 | 7.94 | 0.8 |
| DNGX 120712 | DNGX 353 | | | | | | | | ○ | | | | ○ | ○ | ○ | ○ | ○ | | | 10.00 | 7.94 | 1.2 |
| DNGX 120716 | DNGX 354 | | | | | | | | ○ | | | | ○ | ○ | ○ | | | | | 10.00 | 7.94 | 1.6 |
| DNGX 150708 | DNGX 452 | | | | | | | | | | | | | | | | | | | 12.70 | 7.94 | 0.8 |
| DNGX 150712 | DNGX 453 | | | | | | | | ○ | | | | ○ | ○ | | | | | | 12.70 | 7.94 | 1.2 |
| DNGX 150716 | DNGX 454 | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | | | 12.70 | 7.94 | 1.6 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

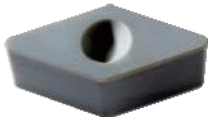
# DNMX

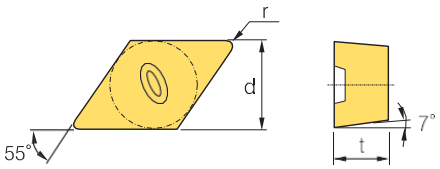





| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| DNMX 120708 | DNMX 352 | | | | | | | | | | | | | | | | | | | 10.00 | 7.94 | 0.8 |
| DNMX 120712 | DNMX 353 | | | | | | | | | | | | | | | | | | | 10.00 | 7.94 | 1.2 |
| DNMX 120716 | DNMX 354 | | | | | | | | | | | | | | | | | | | 10.00 | 7.94 | 1.6 |

# DCGX

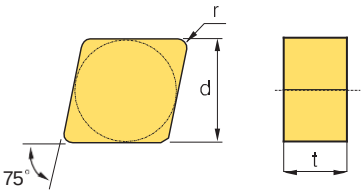





| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| DCGX 150612 | DCGX 443 | | | | | | | | | | | | | | | | | | | 12.7 | 6.35 | 1..2 |
| DCGX 150616 | DCGX 444 | | | | | | | | | | | | | | | | | | | 12.7 | 6.35 | 1.6 |

# ENGN



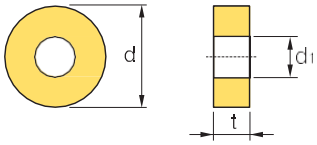



| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| ENGN 130404 | ENGN 431 | | | | | | | | | | | | | | | | | | | 12.7 | 4.76 | 0.4 |
| ENGN 130408 | ENGN 432 | | | | | | | | | | | | | | | | | | | 12.7 | 4.76 | 0.8 |
| ENGN 130412 | ENGN 433 | | | | | | | | | | | | | | | | | | | 12.7 | 4.76 | 1.2 |
| ENGN 130704 | ENGN 451 | | | | | | | | | | | | | | | | | | | 12.7 | 7.94 | 0.4 |
| ENGN 130708 | ENGN 452 | | | | | | | | | | | | | | | | | | | 12.7 | 7.94 | 0.8 |
| ENGN 130712 | ENGN 453 | | | | | | | | | | | | | | | | | | | 12.7 | 7.94 | 1.2 |
| ENGN 130716 | ENGN 454 | | | | | | | | | | | | | | | | | | | 12.7 | 7.94 | 1.6 |

## Star Guide Key to Recommended Tools

| Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

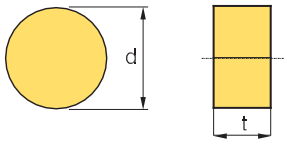





| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | d1 |
| RNGA 120400 | RNGA 430 | ○ | | ○ | | | | | | | | | | | | | | | | 12.70 | 4.76 | 5.16 |
| RNGA 120700 | RNGA 450 | ○ | | ○ | | | | | | | | | | | | | | ○ | ○ | 12.70 | 7.94 | 5.16 |

# RNGN



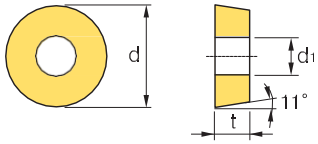



| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t |
| RNGN 060300 | RNGN 220 | | | ○ | | | | | | | | | | | | | | | | 6.35 | 3.18 |
| RNGN 060400 | RNGN 230 | ○ | | | ○ | | | | | | | | | | | | | | | 6.35 | 4.76 |
| RNGN 090300 | RNGN 320 | ○ | | | ○ | | | | | | ○ | ○ | | | | | | | | 9.52 | 3.18 |
| RNGN 090400 | RNGN 330 | ○ | ○ | ○ | ○ | | | | | | ○ | | | | | ○ | | ○ | ○ | 9.52 | 4.76 |
| RNGN 120300 | RNGN 420 | | | | | | | | | | ○ | | | | | ○ | | | | 12.70 | 3.18 |
| RNGN 120400 | RNGN 430 | ● | ○ | ● | ○ | | | | ○ | | ○ | ○ | ● | | | ○ | | ○ | ○ | 12.70 | 4.76 |
| RNGN 120600 | RNGN 440 | | | | | | | | | | | | | | | | | | | 12.70 | 6.35 |
| RNGN 120700 | RNGN 450 | ● | | ● | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ● | | | ○ | | ○ | ○ | 12.70 | 7.94 |
| RNGN 150700 | RNGN 550 | ○ | | | | | | | | | ○ | ○ | | | | | | | | 15.87 | 7.94 |
| RNGN 190600 | RNGN 640 | ○ | | ○ | | | | | | | ○ | | | | | ○ | | | | 19.05 | 6.35 |
| RNGN 190700 | RNGN 650 | ○ | | ○ | ○ | | | | ○ | | | ○ | | | | ○ | | ○ | ○ | 19.05 | 7.94 |
| RNGN 250700 | RNGN 850 | ○ | | | ○ | ○ | | | ○ | ○ | ○ | ○ | | | | | | | | 25.40 | 7.94 |
| RNGN 250900 | RNGN 860 | | | | | | | | | | | | | | | | | | | 25.40 | 9.52 |
| RNGN 320900 | RNGN 106 | ○ | | | | | | | | | | | | | | | | | | 31.75 | 9.52 |
| RNGN 0807MO | - | ○ | | | | | | | | | | | | | | | | | | 8.00 | 7.94 |
| RNGN 1007MO | - | ○ | | | | | | | | | | | | | | | | | | 10.00 | 7.94 |
| RNGN 1207MO | - | ○ | | | | | | | | | | | | | | | | | | 12.00 | 7.94 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

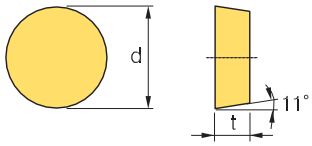





| Type | | Grades | | | | | | | | | | | | | | | | Dimensions(mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | d1 |
| RPGA 120400 | RPGA 430 | ○ | | | | | | | | | | | | | | | | | | 12.70 | 4.76 | 5.16 |
| RPGA 120700 | RPGA 450 | ○ | | | | | | | | | | | | | | | | | | 12.70 | 7.94 | 5.16 |

# RPGN





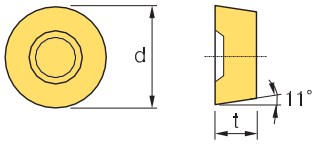

| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t |
| RPGN 090300 | RPGN 320 | ○ | | ○ | | | | | | | | | | | | ○ | | | | 9.52 | 3.18 |
| RPGN 090400 | RPGN 330 | ○ | | ○ | ○ | | | | | | | | | | | | | | | 9.52 | 4.76 |
| RPGN 120300 | RPGN 420 | | | | | | | | | | | | | | | | | | | 12.70 | 3.18 |
| RPGN 120400 | RPGN 430 | ○ | | ○ | | | | | | | | | ○ | | | ○ | | ○ | ○ | 12.70 | 4.76 |
| RPGN 120700 | RPGN 450 | ○ | | ○ | | | | | | | | | | | | ○ | | | | 12.70 | 7.94 |
| RPGN 150700 | RPGN 550 | | | | | | | | | | | | | | | | | | | 15.87 | 7.94 |
| RPGN 190700 | RPGN 650 | | | ○ | | | | | | | | | | | | | | | | 19.05 | 7.94 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# RPGX..DP

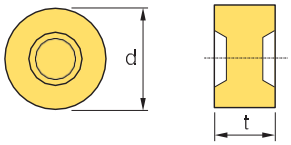





| Type | | Grades | | | | | | | | | | | | | | | | Dimensions(mm) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t |
| RPGX 1204 DP | RPGX 43 DP | | | | | | | | | | | | | | | ○ | | | | 12.70 | 4.76 |
| RPGX 1207 DP | RPGX 45 DP | | | | | | | | | | | | | | | ○ | | | | 12.70 | 7.94 |

# RNGX..DP



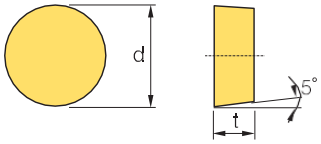



| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t |
| RNGX 1207 DP | RNGX 45 DP | | | | | | | | | | | | | | ○ | ○ | | | | 12.70 | 7.94 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

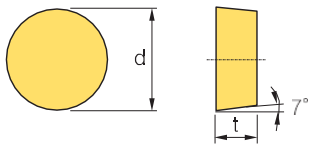





| Type | | Grades | | | | | | | | | | | | | | | | Dimensios (m) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t |
| RBGN 060300 | RBGN 220 | | | ○ | | | | | | | | | | | | | | | | 6.35 | 3.18 |
| RBGN 060400 | RBGN 230 | | | ○ | | | | | | | | | | | | | | | | 6.35 | 4.76 |
| RBGN 090300 | RBGN 320 | ○ | | | | | | | | | | | | | | | | | | 9.52 | 3.18 |
| RBGN 090400 | RBGN 330 | ○ | | | | | | | | | | | | | | | | | | 9.52 | 4.76 |
| RBGN 120400 | RBGN 430 | ○ | | ○ | ○ | | | | | | | | ○ | | | | | | | 12.70 | 4.76 |
| RBGN 120600 | RBGN 440 | ○ | | | | | | | | | | | | | | | | | | 12.70 | 6.35 |
| RBGN 120700 | RBGN 450 | ○ | | ○ | | | | | | | | ○ | ○ | | | ○ | | | | 12.70 | 7.94 |
| RBGN 0604MO | - | | | ○ | | | | | | | | | | | | | | | | 6.00 | 4.76 |
| RBGN 0804MO | - | | | ○ | | | | | | | | | | | | | | | | 8.00 | 4.76 |
| RBGN 1007MO | - | ○ | | | | | | | | | | | | ○ | | | | | | 10.00 | 7.94 |
| RBGN 1207MO | - | | | | | | | | | | | | | | | | | | | 12.00 | 7.94 |
| RBGN 1607MO | - | | | | | | | | | | | | | | | | | | | 16.00 | 7.94 |

# RCGN



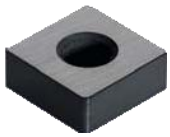


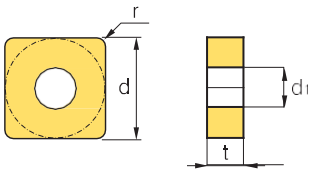

| Type | Grades | | | | | | | | | | | | | | | | Dimensios (mm) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t |
| RCGN 060400 | ○ | | ○ | | | | | | | | | | | | ○ | | | | 6.35 | 4.76 |
| RCGN 060600 | ○ | | ○ | ○ | | | | | | ○ | | | | | ○ | | | | 6.35 | 6.35 |
| RCGN 060700 | ○ | | ○ | ○ | | | | ○ | | | | | | | ○ | | | | 6.35 | 7.94 |
| RCGN 070400 | | | ○ | | | | | | | | | | | | | | | | 7.94 | 4.76 |
| RCGN 090700 | ○ | | ○ | ○ | | | | | | ○ | | | | | ○ | ○ | | | 9.52 | 7.94 |
| RCGN 120700 | ○ | | ○ | ○ | | | | ○ | | ○ | | | | | ○ | ○ | | | 12.70 | 7.94 |
| RCGN 151000 | ○ | | ○ | ○ | | | | ○ | | ○ | | | | | ○ | | | | 15.87 | 10.00 |
| RCGN 191000 | ○ | | ○ | ○ | | | | ○ | | ○ | | | | | ○ | | | | 19.05 | 10.00 |
| RCGN 251200 | ○ | | ○ | ○ | | | | ○ | | ○ | | | | | ○ | | | | 25.40 | 12.70 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

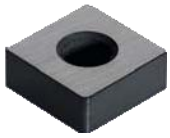
# SNGA

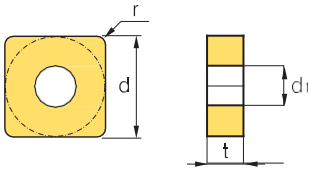





| Type | | Grades | | | | | | | | | | | | | | | | Dimensions(mm) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r | d1 |
| SNGA 090304 | SNGA 321 | ○ | | ○ | | | | | | | | | | | | | | | | 9.52 | 3.18 | 0.4 | 3.81 |
| SNGA 090308 | SNGA 322 | ○ | | ○ | | | | | | | | | | | | | | | | 9.52 | 3.18 | 0.8 | 3.81 |
| SNGA 090312 | SNGA 323 | ○ | | ○ | | | | | | | | | | | | | | | | 9.52 | 3.18 | 1.2 | 3.81 |
| SNGA 090404 | SNGA 331 | | | | | | | | | | | | | | | | | | | 9.52 | 4.76 | 0.4 | 3.81 |
| SNGA 090408 | SNGA 332 | | | | | | | | | | | | | | | | | | | 9.52 | 4.76 | 0.8 | 3.81 |
| SNGA 090412 | SNGA 333 | | | | | | | | | | | | | | | | | | | 9.52 | 4.76 | 1.2 | 3.81 |
| SNGA 090416 | SNGA 334 | | | | | | | | | | | | | | | | | | | 9.52 | 4.76 | 1.6 | 3.81 |
| SNGA 120404 | SNGA 431 | ● | | | | | | | | | | | | | | | | | | 12.70 | 4.76 | 0.4 | 5.16 |
| SNGA 120408 | SNGA 432 | ● | | ● | | ○ | | | | | | ○ | | ○ | | ○ | | ○ | | 12.70 | 4.76 | 0.8 | 5.16 |
| SNGA 120412 | SNGA 433 | ● | | ● | | ○ | | | | | | ○ | | | | ○ | | | | 12.70 | 4.76 | 1.2 | 5.16 |
| SNGA 120416 | SNGA 434 | ○ | | | | | | | | | | | | | | ○ | | | | 12.70 | 4.76 | 1.6 | 5.16 |
| SNGA 120708 | SNGA 452 | ○ | | | | | | | | | | | | | | | | | | 12.70 | 7.94 | 0.8 | 5.16 |
| SNGA 120712 | SNGA 453 | ○ | | | | | | | | | | ○ | | | | | | | | 12.70 | 7.94 | 1.2 | 5.16 |
| SNGA 120716 | SNGA 454 | ○ | | | | | | | | | | ○ | | | | ○ | | | | 12.70 | 7.94 | 1.6 | 5.16 |
| SNGA 150608 | SNGA 542 | | | | | | | | | | | | | | | | | | | 15.87 | 6.35 | 0.8 | 6.35 |
| SNGA 150612 | SNGA 543 | ○ | | | | | | | | | | | | | | | | | | 15.87 | 6.35 | 1.2 | 6.35 |
| SNGA 150616 | SNGA 544 | | | | | | | | | | | | | | | | | | | 15.87 | 6.35 | 1.6 | 6.35 |
| SNGA 190612 | SNGA 643 | ○ | | | | | | | | | | ○ | | | | | | | | 19.05 | 6.35 | 1.2 | 7.94 |
| SNGA 190616 | SNGA 644 | | | | | | | | | | | | | | | | | | | 19.05 | 6.35 | 1.6 | 7.94 |

# SNMA



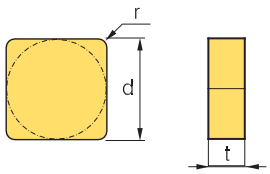



| Type | | Grades | | | | | | | | | | | | | | | | Dimensions(mm) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r | d1 |
| SNMA 120408 | SNMA 432 | | | | | | | | | | | | | | | | | | | 12.70 | 4.76 | 0.8 | 5.16 |
| SNMA 120412 | SNMA 433 | | | | | | | | | | | ○ | | | | ○ | | | | 12.70 | 4.76 | 1.2 | 5.16 |
| SNMA 120416 | SNMA 434 | | | | | | | | | | | ○ | | | | | | | | 12.70 | 4.76 | 1.6 | 5.16 |
| SNMA 150616 | SNMA 544 | | | | | | | | | | | ○ | | | | | | | | 15.87 | 6.35 | 1.6 | 6.35 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |



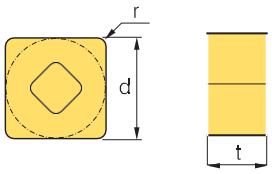



| Type | | Grades | | | | | | | | | | | | | | | | Dimensions(mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| SNGN 090304 | SNGN 321 | ○ | | ○ | | | | | | | | | | | | | | | | 9.52 | 3.18 | 0.4 |
| SNGN 090308 | SNGN 322 | ○ | ○ | ○ | ○ | | | | | | ○ | | ○ | | | | | | | 9.52 | 3.18 | 0.8 |
| SNGN 090312 | SNGN 323 | ○ | | ○ | | | | | | | | | | | | | | | | 9.52 | 3.18 | 1.2 |
| SNGN 090404 | SNGN 331 | | | | | | | | | | | | | | | | | | | 9.52 | 4.76 | 0.4 |
| SNGN 090408 | SNGN 332 | ○ | | | | | | | | | | | ○ | | | | | | | 9.52 | 4.76 | 0.8 |
| SNGN 090412 | SNGN 333 | | | | | | | | ○ | | | | ○ | | | | | | | 9.52 | 4.76 | 1.2 |
| SNGN 120404 | SNGN 431 | ○ | | | | | | | | | ○ | | | | | | | | | 12.70 | 4.76 | 0.4 |
| SNGN 120408 | SNGN 432 | ● | ○ | ● | ○ | ○ | | ○ | | | ○ | ○ | ● | | | ○ | ○ | ○ | ○ | 12.70 | 4.76 | 0.8 |
| SNGN 120412 | SNGN 433 | ● | ○ | ● | ○ | ○ | | ○ | | ○ | ○ | ○ | ● | | ○ | ○ | ○ | ○ | ○ | 12.70 | 4.76 | 1.2 |
| SNGN 120416 | SNGN 434 | ○ | ○ | ○ | | | | ○ | | ○ | ○ | ○ | ○ | ○ | | ○ | ○ | ○ | ○ | 12.70 | 4.76 | 1.6 |
| SNGN 120420 | SNGN 435 | ○ | | | | | | | | | ○ | ○ | ○ | ○ | | | | | | 12.70 | 4.76 | 2.0 |
| SNGN 120604 | SNGN 441 | | | | | | | | | | | | | | | | | | | 12.70 | 6.35 | 0.4 |
| SNGN 120608 | SNGN 442 | ○ | | | | | | | | | | | | | | | | | | 12.70 | 6.35 | 0.8 |
| SNGN 120612 | SNGN 443 | ○ | | | | | | | | | | | | | | | | | | 12.70 | 6.35 | 1.2 |
| SNGN 120616 | SNGN 444 | ○ | | | | | | | | | | | | | | | | | | 12.70 | 6.35 | 1.6 |
| SNGN 120704 | SNGN 451 | | | ○ | | | | | | | | | | | | | | | | 12.70 | 7.94 | 0.4 |
| SNGN 120708 | SNGN 452 | ○ | | ○ | | | | | ○ | | ○ | | | | | ○ | | ○ | ○ | 12.70 | 7.94 | 0.8 |
| SNGN 120712 | SNGN 453 | ○ | ○ | ○ | | | | | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 12.70 | 7.94 | 1.2 |
| SNGN 120716 | SNGN 454 | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | ○ | ○ | 12.70 | 7.94 | 1.6 |
| SNGN 120720 | SNGN 455 | ○ | ○ | ○ | | | | | ○ | | ○ | | | | | | | | | 12.70 | 7.94 | 2.0 |
| SNGN 150404 | SNGN 531 | | | ○ | | | | | | | | | | | | | | | | 15.87 | 4.76 | 0.4 |
| SNGN 150408 | SNGN 532 | | | ○ | | | | | | | | | | | | | | | | 15.87 | 4.76 | 0.8 |
| SNGN 150412 | SNGN 533 | ○ | | | | | | | ○ | | | | | | | | | | | 15.87 | 4.76 | 1.2 |
| SNGN 150416 | SNGN 534 | ○ | | | | | | | | | | | | | | | | | | 15.87 | 4.76 | 1.6 |
| SNGN 150708 | SNGN 552 | ○ | | | | | | | | | | | | | | | | | | 15.87 | 7.94 | 0.8 |
| SNGN 150712 | SNGN 553 | ○ | ○ | ○ | | | | | ○ | | ○ | ○ | ○ | | | | | | | 15.87 | 7.94 | 1.2 |
| SNGN 150716 | SNGN 554 | ○ | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | 15.87 | 7.94 | 1.6 |
| SNGN 190608 | SNGN 642 | | | | | | | | | | | | | | | | | | | 19.05 | 6.35 | 0.8 |
| SNGN 190612 | SNGN 643 | ○ | | | | | | | | | ○ | | ○ | | | ○ | | | | 19.05 | 6.35 | 1.2 |
| SNGN 190616 | SNGN 644 | ○ | | | | | | | | | ○ | | | | | ○ | | ○ | ○ | 19.05 | 6.35 | 1.6 |
| SNGN 190712 | SNGN 653 | ○ | | | | | | | | | | | | | | | | | | 19.05 | 7.94 | 1.2 |
| SNGN 190716 | SNGN 654 | ○ | ○ | ○ | | | | | ○ | | ○ | | ○ | | | ○ | | | | 19.05 | 7.94 | 1.6 |
| SNGN 190720 | SNGN 655 | ○ | | | | | | | ○ | | ○ | | | | | | | | | 19.05 | 7.94 | 2.0 |
| SNGN 250720 | SNGN 854 | ○ | | | | | | | | | ○ | | | | | | | | | 25.40 | 7.94 | 2.0 |
| SNGN 250724 | SNGN 856 | ○ | | ○ | | | | | | | ○ | ○ | | | | | | | | 25.40 | 7.94 | 2.4 |
| SNGN 250924 | SNGN 866 | ○ | | | | | | | ○ | | ○ | ○ | ○ | | | ○ | | | | 25.40 | 9.52 | 2.4 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

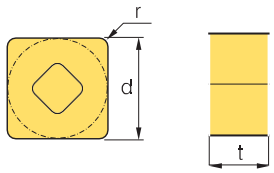





| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| SNGX 120408 | SNGX 432 | | | | | | | | | | | | ○ | | | | | | | 12.70 | 4.76 | 0.8 |
| SNGX 120412 | SNGX 433 | | | | | | | | | | | | ○ | | | | | | | 12.70 | 4.76 | 1.2 |
| SNGX 120416 | SNGX 434 | | | | | | | | | | | | ○ | | | | | | | 12.70 | 4.76 | 1.6 |
| SNGX 120708 | SNGX 452 | ○ | | | | | | | | | | ○ | | ○ | | | | | | 12.70 | 7.94 | 0.8 |
| SNGX 120712 | SNGX 453 | ○ | ○ | | | | | | | | | ○ | ○ | ○ | | ○ | | | | 12.70 | 7.94 | 1.2 |
| SNGX 120716 | SNGX 454 | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | | | | 12.70 | 7.94 | 1.6 |
| SNGX 150708 | SNGX 552 | ○ | ○ | | | | | | | | | ○ | | ○ | | | | | | 15.87 | 7.94 | 0.8 |
| SNGX 150712 | SNGX 553 | ○ | ○ | | | | | | | | | ○ | | ○ | | ○ | | | | 15.87 | 7.94 | 1.2 |
| SNGX 150716 | SNGX 554 | | | | | | | | | | | ○ | ○ | ○ | | | | | | 15.87 | 7.94 | 1.6 |

# SNMX

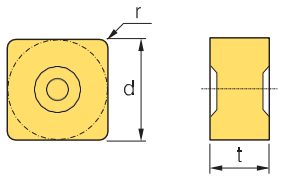





| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| SNMX 120712 | SNMX 453 | | | | | | | | | | | | | | | | | | | 12.70 | 9.74 | 1.2 |
| SNMX 120716 | SNMX 454 | | | | | | | | | | | | | | | | | | | 12.70 | 9.74 | 1.6 |

# SNMX





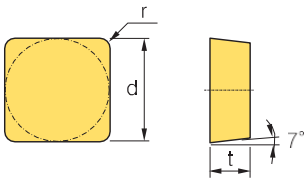

| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| SNMX 120716 RD | SNMX 454 RD | | | | | | | | | | | | | | | | | | | 12.70 | 9.74 | 1.6 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# SCGN

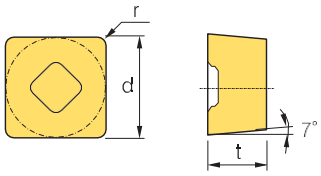





| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| SCGN 090412 | SCGN 333 | ○ | | | | | | | | | | | ○ | | | | | | | 9.52 | 4.76 | 1.2 |
| SCGN 090416 | SCGN 334 | ○ | | | | | | | | | | | | | | | | | | 9.52 | 4.76 | 1.6 |
| SCGN 120404 | SCGN 431 | | | ○ | | | | | | | | | | | | | | | | 12.70 | 4.76 | 0.4 |
| SCGN 120408 | SCGN 432 | ○ | | ○ | | | | | | | | | | | | | | | | 12.70 | 4.76 | 0.8 |
| SCGN 120412 | SCGN 433 | | | | | | | | | ○ | | ○ | ○ | | ○ | ○ | | | | 12.70 | 4.76 | 1.2 |
| SCGN 120416 | SCGN 434 | ○ | | ○ | | | | | | | | | | | | | | | | 12.70 | 4.76 | 1.6 |

# SCGX

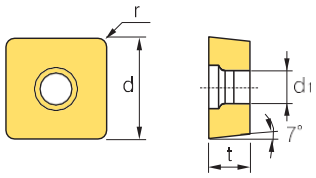





| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| SCGX 120408 | SCGX 432 | | | | | | | | | | | | | | | | | | | 12.70 | 4.76 | 0.8 |
| SCGX 120616 | SCGX 444 | | | | | | | | | | | | | | ○ | | | | | 12.70 | 6.35 | 1.6 |
| SCGX 120716 | SCGX 454 | | | | | | | | | | | | | | | | | | | 12.70 | 7.94 | 1.6 |

# SCGW





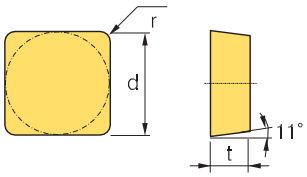

| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r | d1 |
| SCGW 09T304 | | | | | | | | | | | | | | | | | | | | 9.52 | 3.97 | 0.4 | 4.40 |
| SCGW 09T308 | | | | | | | | | | | | | | | | | | | | 9.52 | 3.97 | 0.8 | 4.40 |
| SCGW 120408 | | | | | | | | | | | | | | | | | | | | 12.7 | 4.76 | 0.8 | 5.50 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# SPGN

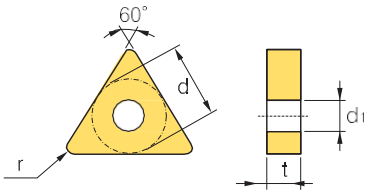





| Type | | Grades | | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| SPGN 090304 | SPGN 321 | ○ | | ○ | | | | | | | ○ | | | | | | | | | 9.52 | 3.18 | 0.4 |
| SPGN 090308 | SPGN 322 | ○ | ○ | ○ | | | | | | | | ○ | ○ | ○ | | | | ○ | ○ | 9.52 | 3.18 | 0.8 |
| SPGN 090312 | SPGN 323 | ○ | | | | | | | | | | | | | | | | | | 9.52 | 3.18 | 1.2 |
| SPGN 120304 | SPGN 421 | ○ | | ○ | | | | | | | | | | | | | | | | 12.70 | 3.18 | 0.4 |
| SPGN 120308 | SPGN 422 | ○ | | ○ | | | | | ○ | | ○ | | ○ | | | | | | | 12.70 | 3.18 | 0.8 |
| SPGN 120312 | SPGN 423 | ○ | ○ | ○ | | | | | | | ○ | | ○ | | ○ | | | | | 12.70 | 3.18 | 1.2 |
| SPGN 120404 | SPGN 431 | | | | | | | | | | | | | | | | | | | 12.70 | 4.76 | 0.4 |
| SPGN 120408 | SPGN 432 | ○ | | ○ | ○ | | | | | | ○ | | | | | | | ○ | ○ | 12.70 | 4.76 | 0.8 |
| SPGN 120412 | SPGN 433 | ○ | ○ | ○ | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 12.70 | 4.76 | 1.2 |
| SPGN 120416 | SPGN 434 | ○ | ○ | ○ | | | | | | | | | | | | | | ○ | ○ | 12.70 | 4.76 | 1.6 |
| SPGN 150408 | SPGN 532 | | | | | | | | | | | | | | | | | | | 15.87 | 4.76 | 0.8 |
| SPGN 150412 | SPGN 533 | | | ○ | | | | | | | | | | | | | | | | 15.87 | 4.76 | 1.2 |
| SPGN 190412 | SPGN 633 | ○ | | | | | | | | | | | | | | | | | | 19.05 | 4.76 | 1.2 |
| SPGN 190416 | SPGN 634 | ○ | | ○ | | | | | | | | | ○ | ○ | | | | | | 19.05 | 4.76 | 1.6 |

# TNGA



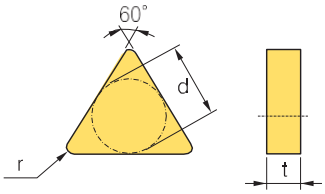



| Type | | Grades | | | | | | | | | | | | | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r | d1 |
| TNGA 110304 | TNGA 221 | ○ | | ○ | | | | | | | | | | | | | | | | 6.35 | 3.18 | 0.4 | 2.26 |
| TNGA 110308 | TNGA 222 | ○ | | ○ | | | | | | | | | | | | | | | | 6.35 | 3.18 | 0.8 | 2.26 |
| TNGA 160304 | TNGA 321 | ○ | | ○ | | | | | | | | | | | | | | | | 9.52 | 3.18 | 0.4 | 3.81 |
| TNGA 160308 | TNGA 322 | ○ | | ○ | | | | | ○ | | ○ | | | | | | | | | 9.52 | 3.18 | 0.8 | 3.81 |
| TNGA 160312 | TNGA 323 | ○ | | ○ | | | | | | | | | | | | | | | | 9.52 | 3.18 | 1.2 | 3.81 |
| TNGA 160404 | TNGA 331 | ● | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | ○ | | | | 9.52 | 4.76 | 0.4 | 3.81 |
| TNGA 160408 | TNGA 332 | ● | ○ | ● | ○ | ○ | | | | ○ | ○ | ○ | ● | ○ | | ○ | | ○ | ○ | 9.52 | 4.76 | 0.8 | 3.81 |
| TNGA 160412 | TNGA 333 | ○ | ○ | ● | ○ | ○ | | | | ○ | ○ | ○ | ● | ○ | | ○ | | | | 9.52 | 4.76 | 1.2 | 3.81 |
| TNGA 160416 | TNGA 334 | ○ | | ○ | ○ | | | | ○ | | ○ | ○ | ○ | ○ | | ○ | | | | 9.52 | 4.76 | 1.6 | 3.81 |
| TNGA 220404 | TNGA 431 | ○ | | ○ | | | | | | | ○ | | | | | | | | | 12.70 | 4.76 | 0.4 | 5.16 |
| TNGA 220408 | TNGA 432 | ○ | | ○ | | | | | | | ○ | | ○ | | | ○ | | | | 12.70 | 4.76 | 0.8 | 5.16 |
| TNGA 220412 | TNGA 433 | ○ | | ○ | | | | | | | ○ | | ○ | | | ○ | | | | 12.70 | 4.76 | 1.2 | 5.16 |
| TNGA 220416 | TNGA 434 | ○ | | ○ | | | | | ○ | | ○ | | ○ | | | | | | | 12.70 | 4.76 | 1.6 | 5.16 |
| TNGA 220708 | TNGA 452 | ○ | | ○ | | | | | | | | | | | | | | | | 12.70 | 7.94 | 0.8 | 5.16 |
| TNGA 220712 | TNGA 453 | ○ | | | | | | | | | | | | | | | | | | 12.70 | 7.94 | 1.2 | 5.16 |
| TNGA 270608 | TNGA 542 | | | ○ | | | | | | | | | | | | | | | | 15.87 | 6.35 | 0.8 | 6.35 |
| TNGA 270612 | TNGA 543 | | | ○ | | | | | | | | | | | | | | | | 15.87 | 6.35 | 1.2 | 6.35 |
| TNGA 330924 | TNGA 666 | | | ○ | | | | | | | | | | | | | | | | 19.05 | 9.52 | 2.4 | 7.94 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

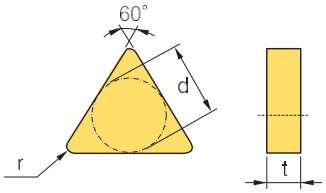





| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| TNGN 110304 | TNGN 221 | ○ | | ○ | | | | | | | ○ | | | | | | | | | 6.35 | 3.18 | 0.4 |
| TNGN 110308 | TNGN 222 | ○ | | ○ | | | | | ○ | | ○ | ○ | | | | | | | | 6.35 | 3.18 | 0.8 |
| TNGN 160404 | TNGN 331 | ● | ○ | ○ | | | | | ○ | | ○ | | | | | | | | | 9.52 | 4.76 | 0.4 |
| TNGN 160408 | TNGN 332 | ● | ○ | ● | ○ | ○ | | ○ | ○ | | ○ | ○ | ○ | | ○ | | | | | 9.52 | 4.76 | 0.8 |
| TNGN 160412 | TNGN 333 | ○ | | ● | ○ | ○ | | ○ | | | ○ | ○ | ● | | | | | ○ | ○ | 9.52 | 4.76 | 1.2 |
| TNGN 160416 | TNGN 334 | ○ | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | | | | | | | 9.52 | 4.76 | 1.6 |
| TNGN 160704 | TNGN 351 | ○ | | | | | | | | | | | | | | | | | | 9.52 | 7.94 | 0.4 |
| TNGN 160708 | TNGN 352 | ○ | ○ | ○ | | | | | | | | ○ | | | | | | | | 9.52 | 7.94 | 0.8 |
| TNGN 160712 | TNGN 353 | ○ | | ○ | | | | | ○ | | ○ | ○ | | | | | | | | 9.52 | 7.94 | 1.2 |
| TNGN 160716 | TNGN 354 | ○ | | ○ | | | | | | | ○ | | | | | | | | | 9.52 | 7.94 | 1.6 |
| TNGN 220404 | TNGN 431 | ○ | | | | | | | | | | | | | | | | | | 12.70 | 4.76 | 0.4 |
| TNGN 220408 | TNGN 432 | ○ | | ○ | | | | | | | ○ | | ○ | | | ○ | | ○ | ○ | 12.70 | 4.76 | 0.8 |
| TNGN 220412 | TNGN 433 | ○ | | ○ | | | | | | | ○ | | ○ | | | ○ | | ○ | ○ | 12.70 | 4.76 | 1.2 |
| TNGN 220416 | TNGN 434 | | | ○ | | | | | | | ○ | | ○ | | | | | ○ | ○ | 12.70 | 4.76 | 1.6 |
| TNGN 220708 | TNGN 452 | ○ | | | | | | | | | | | | | | | | | | 12.70 | 7.94 | 0.8 |
| TNGN 220712 | TNGN 453 | | | ○ | | | | | | | | | | | | | | | | 12.70 | 7.94 | 1.2 |
| TNGN 220716 | TNGN 454 | | | ○ | | | | | | | | | | | | | | | | 12.70 | 7.94 | 1.6 |
| TNGN 270608 | TNGN 542 | ○ | | ○ | | | | | | | | | | | | | | | | 15.87 | 6.35 | 0.8 |
| TNGN 270612 | TNGN 543 | ○ | | ○ | | | | | | | | | | | | | | | | 15.87 | 6.35 | 1.2 |
| TNGN 270616 | TNGN 544 | | | ○ | | | | | | | | | | | | ○ | | | | 15.87 | 6.35 | 1.6 |
| TNGN 330924 | TNGN 666 | | | ○ | | | | | | | | | | | | | | | | 19.05 | 9.52 | 2.4 |
| TNGN 440932 | TNGN 868 | ○ | | ○ | | | | | | | ○ | | | | | | | | | 25.40 | 9.52 | 3.2 |

# TCUN





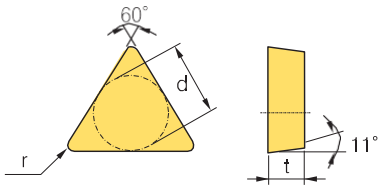

| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| TCUN 160408 | TCUN 332 | | | | | | | | | | | | | | | | | | | 9.52 | 4.76 | 0.8 |
| TCUN 160412 | TCUN 333 | | | | | | | | | | | | | | | | | | | 9.52 | 4.76 | 1.2 |
| TCUN 160416 | TCUN 334 | | | | | | | | | | | | | | | | | | | 9.52 | 4.76 | 1.6 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# TPGN

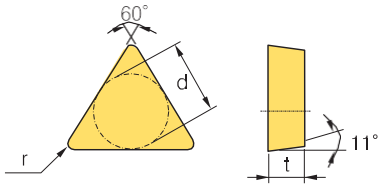





| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| TPGN 090204 | TPGN 731 | | | ○ | | | | | | | | | | | | | | | | 5.56 | 2.38 | 0.4 |
| TPGN 090208 | TPGN 732 | | | ○ | | | | | | | | | | | | | | | | 5.56 | 2.38 | 0.8 |
| TPGN 110304 | TPGN 221 | ○ | ○ | ○ | | | | | | | ○ | | ○ | | | | | | | 6.35 | 3.18 | 0.4 |
| TPGN 110308 | TPGN 222 | ○ | ○ | ○ | | | | | | | ○ | ○ | ○ | | | ○ | | ○ | ○ | 6.35 | 3.18 | 0.8 |
| TPGN 160304 | TPGN 321 | ○ | ○ | ○ | | | | | ○ | | ○ | | ○ | | | | | | | 9.52 | 3.18 | 0.4 |
| TPGN 160308 | TPGN 322 | ○ | ○ | ○ | | | | | ○ | | ○ | ○ | ○ | ○ | | ○ | | ○ | ○ | 9.52 | 3.18 | 0.8 |
| TPGN 160312 | TPGN 323 | ○ | | ○ | | | | | | | | | ○ | ○ | | | | ○ | ○ | 9.52 | 3.18 | 1.2 |
| TPGN 160404 | TPGN 331 | ○ | | | | | | | | | | | | | | | | | | 9.52 | 4.76 | 0.4 |
| TPGN 160408 | TPGN 332 | ○ | | ○ | | | | | | | | | | | | ○ | | | | 9.52 | 4.76 | 0.8 |
| TPGN 160412 | TPGN 333 | ○ | | | | | | | | | | | | | | ○ | | | | 9.52 | 4.76 | 1.2 |
| TPGN 160416 | TPGN 334 | ○ | | | | | | | | | | | | | | | | | | 9.52 | 4.76 | 1.6 |
| TPGN 220404 | TPGN 431 | ○ | | ○ | | | | | | | | | | | | | | | | 12.70 | 4.76 | 0.4 |
| TPGN 220408 | TPGN 432 | ○ | | ○ | | | | | | | ○ | | | | | | | ○ | ○ | 12.70 | 4.76 | 0.8 |
| TPGN 220412 | TPGN 433 | ○ | | ○ | | | | | | | | ○ | ○ | | | | | | | 12.70 | 4.76 | 1.2 |
| TPGN 220416 | TPGN 434 | ○ | | ○ | | | | | | | | | | | | | | | | 12.70 | 4.76 | 1.6 |
| TPGN 220712 | TPGN 453 | | | | | | | | | | | | | | | | | | | 12.70 | 7.94 | 1.2 |
| TPGN 220716 | TPGN 454 | | | | | | | | | | | | | | | | | | | 12.70 | 7.94 | 1.6 |
| TPGN 271232 | TPGN 588 | | | ○ | | | | | | | | | | | | | | | | 15.87 | 12.70 | 3.2 |

# TPUN



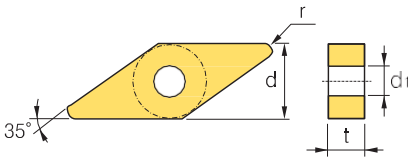



| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| TPUN 110308 | TPUN 222 | | | | | | | | | | | | | | | | | | | 6.35 | 3.18 | 0.8 |
| TPUN 110312 | TPUN 223 | | | | | | | | | | | | | | | | | | | 6.35 | 3.18 | 1.2 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

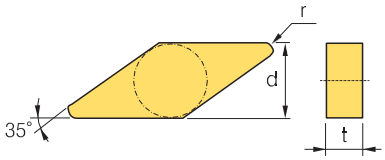





| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r | d1 |
| VNGA 160404 | VNGA 331 | ○ | | ○ | ○ | | | | | | ○ | | | | | | | | | 9.52 | 4.76 | 0.4 | 3.81 |
| VNGA 160408 | VNGA 332 | ○ | | ○ | ○ | ○ | | ○ | | ○ | ○ | ○ | ○ | ○ | | ○ | | | | 9.52 | 4.76 | 0.8 | 3.81 |
| VNGA 160412 | VNGA 333 | ○ | | ○ | ○ | ○ | | | | ○ | ○ | ○ | ○ | ○ | | | | | | 9.52 | 4.76 | 1.2 | 3.81 |
| VNGA 160604 | VNGA 341 | ○ | | ○ | | | | | | | | | | | | | | | | 9.52 | 6.35 | 0.4 | 3.81 |
| VNGA 160608 | VNGA 342 | ○ | | ○ | | | | | | | | | | | | | | | | 9.52 | 6.35 | 0.8 | 3.81 |
| VNGA 160612 | VNGA 343 | ○ | | ○ | | | | | | | | | | | | | | | | 9.52 | 6.35 | 1.2 | 3.81 |
| VNGA 220404 | VNGA 431 | ○ | | ○ | | | | | | | | | | | | | | | | 12.70 | 4.76 | 0.4 | 5.16 |
| VNGA 220408 | VNGA 432 | ○ | | ○ | | | | | | | | | ○ | | | | | | | 12.70 | 4.76 | 0.8 | 5.16 |
| VNGA 220412 | VNGA 433 | ○ | | ○ | | | | | | | | | ○ | | | | | | | 12.70 | 4.76 | 1.2 | 5.16 |
| VNGA 220424 | VNGA 436 | | | | | | | | | | | | | | | | | ○ | ○ | 12.70 | 4.76 | 2.4 | 5.16 |

# VNGN





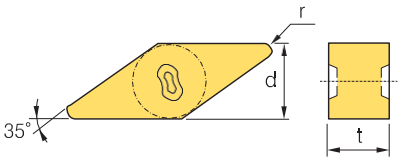

| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| VNGN 160404 | VNGN 331 | | | ○ | | | | | | | | | | | | | | | | 9.52 | 4.76 | 0.4 |
| VNGN 160408 | VNGN 332 | | | ○ | | | | | | | | | | | | | | | | 9.52 | 4.76 | 0.8 |
| VNGN 160704 | VNGN 351 | | | ○ | | | | | | | | | | | | | | | | 9.52 | 7.94 | 0.4 |
| VNGN 160708 | VNGN 352 | | | ○ | | | | | | | | | | | | | | | | 9.52 | 7.94 | 0.8 |
| VNGN 160712 | VNGN 353 | | | | | | | | | | | | | | | | | | | 9.52 | 7.94 | 1.2 |
| VNGN 160716 | VNGN 354 | | | | | | | | | | | | | | | | | | | 9.52 | 7.94 | 1.6 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# VNGX

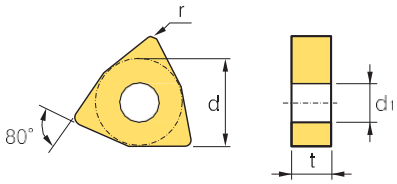





| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| VNGX 160708 | VNGX 352 | | | | | | | | | | | | | | | | | | | 9.52 | 7.94 | 0.4 |
| VNGX 160712 | VNGX 353 | | | | | | | | | | | | | | | | | | | 9.52 | 7.94 | 1.2 |
| VNGX 160716 | VNGX 354 | | | | | | | | | | | | | | | | | | | 9.52 | 7.94 | 1.6 |

# WNGA

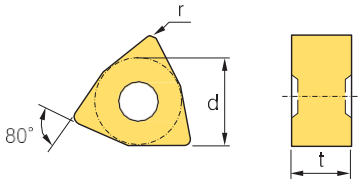





| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| WNGA 080404 | WNGA 431 | | | | | | | | | | | | | | | | | | | 12.70 | 4.76 | 0.4 |
| WNGA 080408 | WNGA 432 | | | | | | | | | | | | | | | | | | | 12.70 | 4.76 | 0.8 |
| WNGA 080412 | WNGA 433 | | | | | | | | | | | | | | | | | | | 12.70 | 4.76 | 1.2 |

# WNGX



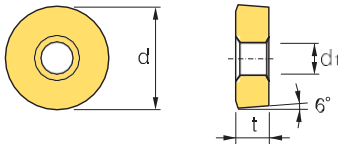



| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r |
| WNGX 080708 | WNGX 452 | | | | | | | | | | | | | | | | | | | 12.70 | 7.94 | 0.4 |
| WNGX 080712 | WNGX 453 | | | | | | | | | | | | | | | | | | | 12.70 | 7.94 | 0.8 |
| WNGX 080716 | WNGX 454 | | | | | | | | | | | | | | | | | | | 12.70 | 7.94 | 1.2 |

## Star Guide Key to Recommended Tools

| Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

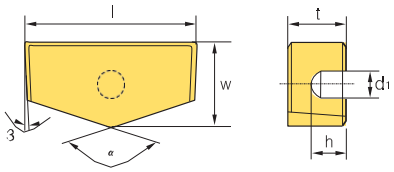





| Type | | Grades | | | | | | | | | | | | | | | | | Dimensions(mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | d1 |
| CDH 120600 | CDH 22 | ○ | | ○ | ○ | | | | | | | | | | | | | | | 12.70 | 6.35 | 3.18 |
| CDH 120900 | CDH 23 | ○ | | | | | | | | | | | | | | | | | | 12.70 | 9.52 | 3.18 |
| CDH 190900 | CDH 33 | ○ | | ○ | ○ | ○ | | | | | ○ | | | | | | | | | 19.05 | 9.52 | 6.35 |
| CDH 191200 | CDH 34 | ○ | | | | | | | | | | | | | | | | | | 19.05 | 12.70 | 6.35 |
| CDH 251200 | CDH 42 | ○ | | ○ | ○ | | | | ○ | | ○ | | | | | | | | | 25.40 | 12.70 | 6.75 |
| CDH 251900 | CDH 43 | ○ | | | | | | | ○ | | ○ | | | | | | | | | 25.40 | 19.05 | 6.75 |
| CDH 320900 | CDH 515 | ○ | | ○ | | | | | ○ | | ○ | ○ | | | | | | | | 31.75 | 9.52 | 10.00 |
| CDH 321900 | CDH 53 | ○ | | ○ | ○ | | | | ○ | | ○ | ○ | | | | | | | | 31.75 | 19.05 | 10.00 |
| CDH 381100 | - | ○ | | | | | | | | | | | | | | | | | | 38.10 | 11.11 | 9.93 |

# F- Series

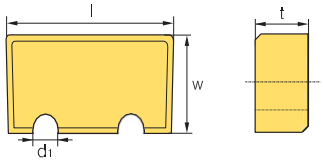





| Type | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | l | w | r | d1 | h | α |
| F 13941 | | | | | | | | | | | | | | | | | | | 32.00 | 19.05 | 12.00 | 6.50 | 6.00 | 120° |
| F 10537 | | | | | | | | | | | | | | | | | | | 44.50 | 25.40 | 14.20 | 6.50 | 7.00 | 120° |

# F-Series



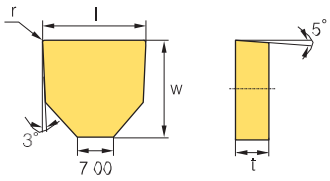



| Type | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | l | w | t | d1 |
| F 10537 V | | | | | | | | | | | | | | | | | | | 44.00 | 26.00 | 15.0 | 5.00 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

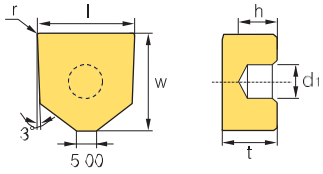





| Type | Grades | | | | | | | | | | | | | | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | l | t | r | w |
| F 250723 | | | ○ | | | | | | | | | | | | | | | | 25.00 | 7.94 | 1.20 | 23.00 |

# F-Series

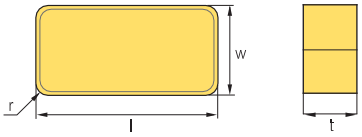





| Type | Grades | | | | | | | | | | | | | | | | | | Dimensions (mm) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | l | t | r | w | d1 | h |
| F 251425 | | | | | | | | | | | | | | | | | | | 25.00 | 14.40 | 2.4 | 25.4 | 9.17 | 10 |
| F251425 H65 | | | | | | | | | | | | | | | | | | | 25.40 | 14.40 | 2.4 | 25.4 | 6.50 | 10 |

# LNJ






| Type | Grades | | | | | | | | | | | | | | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | l | t | r | w |
| LNJ 5464 | | | | | | | | | | | | | | | | | | | 25.40 | 15.87 | 9.52 | 1.6 |
| LNJ 5568 | | | | | | | | | | | | | | | | | | | 31.75 | 15.87 | 9.52 | 3.2 |
| LNJ 6588 | | | | | | | | | | | | | | | | | | | 31.75 | 19.05 | 12.70 | 3.2 |
| LNJ 6688 | | | | | | | | | | | | | | | | | | | 38.10 | 19.05 | 12.70 | 3.2 |
| LNJ 6898 | | | | | | | | | | | | | | | | | | | 48.10 | 21.05 | 12.70 | 3.2 |

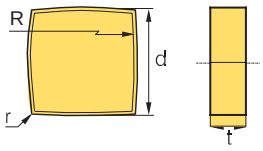
## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# SNGN3812R

## TURNING CERAMICS

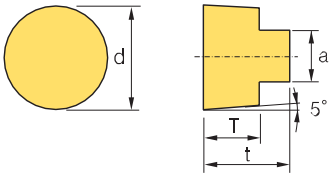





| Type | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | r | R |
| SNGN 3812R | ○ | | ○ | ○ | | | | | | | | | | | | | | | 38.10 | 12.70 | 0.4 | 114 |

# RBGX





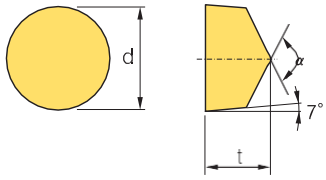

| Type | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | T | a |
| RBGX 06T | ○ | | ○ | | | | | | | | | | | | | | | | 6.00 | 5.00 | 3.00 | 3.00 |
| RBGX 08T | ○ | | ○ | | | | | | | | | | | | | | | | 8.00 | 6.50 | 4.00 | 4.00 |
| RBGX 10T | | | ○ | | | | | | | | | | | | | | | | 10.00 | 9.00 | 6.00 | 6.00 |
| RBGX 12T | ○ | | ○ | | | | | | | | | | | | | | | | 12.00 | 9.00 | 6.00 | 6.00 |
| RBGX 16T | ○ | | ○ | | | | | | | | | | | | | | | | 16.00 | 13.00 | 8.00 | 8.00 |
| RBGX 20T | ○ | | ○ | ○ | ○ | | | | | | | | | | | | | | 20.00 | 15.00 | 10.00 | 10.00 |
| RBGX 26T | ○ | | ○ | | | | | | | | | | | | | | | | 26.00 | 15.00 | 10.00 | 14.00 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# RCGX

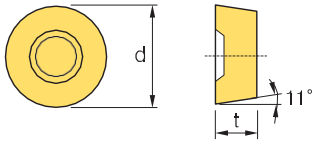





| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | α |
| RCGX 060400 | RCGX 102 | ○ | | ○ | | | | | | | | | | | | ○ | | ○ | ○ | 6.35 | 4.76 | 120° |
| RCGX 060600 | RCGX 102 | ○ | | ○ | ○ | ○ | | | | | | | | | | ○ | | | | 6.35 | 6.35 | 120° |
| RCGX 060700 | RCGX 102 | ○ | | ○ | ○ | ○ | | | | | ○ | | | | | ○ | | | | 6.35 | 7.94 | 120° |
| RCGX 090700 | RCGX 103 | ○ | | ○ | ○ | ○ | ○ | | | | ○ | | | | | ○ | ○ | ○ | ○ | 9.52 | 7.94 | 120° |
| RCGX 120700 | RCGX 104 | ○ | | ○ | ○ | ○ | ○ | | | | ○ | | | | | ○ | ○ | ○ | ○ | 12.70 | 7.94 | 120° |
| RCGX 151000 | RCGX 105 | ○ | | ○ | ○ | ○ | | | | | ○ | | | | | ○ | ○ | | | 15.87 | 10.00 | 120° |
| RCGX 191000 | RCGX 106 | ○ | | ○ | ○ | ○ | | | | | ○ | | | | | ○ | | | | 19.05 | 10.00 | 120° |
| RCGX 251200 | RCGX 108 | ○ | | ○ | ○ | ○ | | | | | ○ | | | | | ○ | | | | 25.40 | 12.00 | 140° |

# RPGX

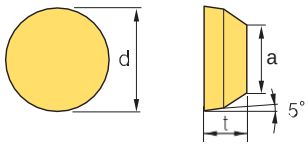





| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | A800 | d | t | α |
| RPGX 060400 | RPGX 102 | | | | | | | | | | | | | | | | | | | 6.35 | 4.76 | 120° |
| RPGX 090700 | RPGX 103 | | | | | | | | | | | | | | | | | | | 9.52 | 7.94 | 120° |
| RPGX 120700 | RPGX 104 | | | | | | | | | | | | | | | | | | | 12.70 | 7.94 | 120° |

# RXGX






| Type | | Grades | | | | | | | | | | | | | | | | Dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | ASA | A1010 | A2010 | A3010 | A5010 | A7010 | A1010C | A3010C | A200 | A300 | A2020 | A3020 | A4020 | A5020 | A6020 | A8020 | A9020 | A400 | CW80 | d | t | a |
| RXGX 1207MO | - | | | | | | | | | | | | | | | | | | | 12.00 | 7.94 | 6.9 |
| RXGX 1608MO | - | | | | | | | | | | | | | | | | | | | 16.00 | 8.00 | 9.5 |
| RXGX 2508MO | - | | | | | | | | | | | | | | | | | | | 25.00 | 8.00 | 18.20 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

| CCLN | CCBN | CCKN | CDHN |
|---|---|---|---|
|  |  |  |  |

| CDJN | CDNN | CEFN | CEGN |
|---|---|---|---|
|  |  |  |  |

| CEJN | CRDN | CRGN | CRDB |
|---|---|---|---|
|  |  |  |  |

| CRDC | CSBN | CSDN | CSKN |
|---|---|---|---|
|  |  |  |  |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

| CSRN | CSSN | CSYN | CTFN |
|---|---|---|---|
|  |  |  |  |

| CTGN | CWLN | CSRC | CSSC |
|---|---|---|---|
|  |  |  |  |

| CSTP | CTFP | HRCD | CVJN |
|---|---|---|---|
|  |  |  |  |

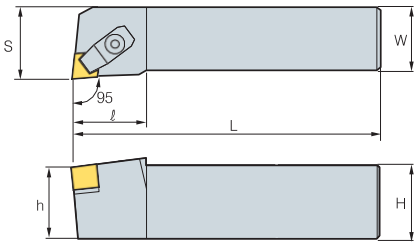
| CVVN | CLKN | CFLN | |
|---|---|---|---|
|  |  |  | |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CCLN





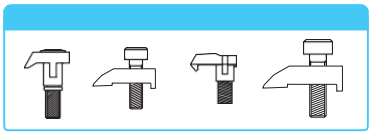

(mm)

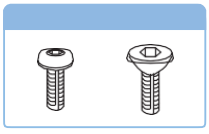
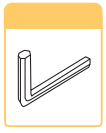
| Designation | H(h) | W | L | ℓ | S | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CCLNR/L 2525M12-A4** | 25 | 25 | 150 | 35 | 32 | CNGN1204 | UH1 | SHCN4A | BM510 | LW4 |
| **CCLNR/L 2525M12-A7** | 25 | 25 | 150 | 35 | 32 | CNGN1207 | UH1 | SHCN4A | BM510 | LW4 |
| **CCLNR/L 2525M12-X7** | 25 | 25 | 150 | 35 | 32 | CNG(V)X1207 | UH5 | SHCN4A | BM510 | LW4 |
| **CCLNR/L 3225P12-A4** | 32 | 25 | 170 | 35 | 32 | CNGN1204 | UH1 | SHCN4A | BM510 | LW4 |
| **CCLNR/L 3225P12-A7** | 32 | 25 | 170 | 35 | 32 | CNGN1207 | UH1 | SHCN4A | BM510 | LW4 |
| **CCLNR/L 3225P12-X7** | 32 | 25 | 170 | 35 | 32 | CNG(V)X1207 | UH5 | SHCN4A | BM510 | LW4 |
| **CCLNR/L 3225P16-X7** | 32 | 25 | 170 | 35 | 32 | CNG(V)X1607 | UH5 | SHCN5A | FM510 | LW4 |
| **CCLNR/L 3225P16-A7** | 32 | 25 | 170 | 35 | 32 | CNGN1607 | UH1 | SHCN5A | FM510 | LW4 |
| **CCLNR/L 4040S19-A7** | 40 | 40 | 250 | 60 | 50 | CNGN1907 | UH4 | SHCN6A | FM615 | LW6 |
| **CCLNR/L 5050T25-A9** | 50 | 50 | 300 | 65 | 60 | CNGN2509 | UH25 | SHCN8 | FM815 | LW6 |

## Available Inserts

| CNGN | CNGX | CNVX |
|---|---|---|
|  |  |  |

## Parts



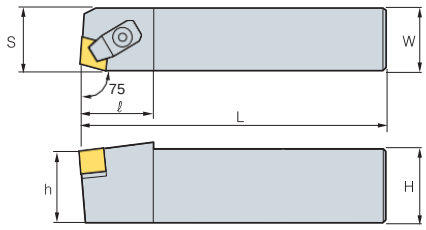
| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| UH1 | UH4 | UH5 | UH25 | SHCN4A<br>SHCN5A<br>SHCN6A<br>SHCN8 | | BM510 | FM510<br>FM615<br>FM815 | | LW4<br>LW6 | | |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CCBN





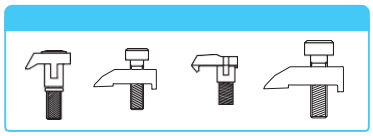

(mm)

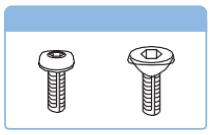
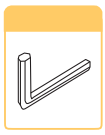
| Designation | H(h) | W | L | ℓ | S | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CCBNR/L 2525M12-A4** | 25 | 25 | 150 | 35 | 22 | CNGN1204 | UH1 | SHCN4A | BM510 | LW4 |
| **CCBNR/L 2525M12-A7** | 25 | 25 | 150 | 35 | 22 | CNGN1207 | UH1 | SHCN4A | BM510 | LW4 |
| **CCBNR/L 2525M12-X7** | 25 | 25 | 150 | 35 | 22 | CNG(V)X1207 | UH5 | SHCN4A | BM510 | LW4 |
| **CCBNR/L 3225P12-A4** | 32 | 25 | 170 | 35 | 22 | CNGN1204 | UH1 | SHCN4A | BM510 | LW4 |
| **CCBNR/L 3225P12-A7** | 32 | 25 | 170 | 35 | 22 | CNGN1207 | UH1 | SHCN4A | BM510 | LW4 |
| **CCBNR/L 3225P12-X7** | 32 | 25 | 170 | 35 | 22 | CNG(V)X1207 | UH5 | SHCN4A | BM510 | LW4 |
| **CCBNR/L 3225P16-A7** | 32 | 25 | 170 | 35 | 27 | CNGN1607 | UH1 | SHCN5A | FM510 | LW4 |
| **CCBNR/L 3225P16-X7** | 32 | 25 | 170 | 35 | 27 | CNG(V)X1607 | UH5 | SHCN5A | FM510 | LW4 |
| **CCBNR/L 4040S19-A7** | 40 | 40 | 250 | 60 | 36 | CNGN1907 | UH4 | SHCN6A | FM615 | LW6 |
| **CCBNR/L 5050T25-A9** | 50 | 50 | 300 | 65 | 45 | CNGN2509 | UH25 | SHCN8 | FM815 | LW6 |

## Available Inserts

| CNGN | CNGX | CNVX |
|---|---|---|
|  |  |  |

## Parts



| | | |
|---|---|---|
| UH1 UH4 UH5 UH25 | SHCN4A<br>SHCN5A<br>SHCN6A<br>SHCN8 | BM510 FM510<br>FM615<br>FM815 |

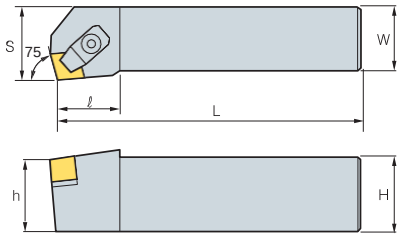
LW4
LW6

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CCKN






(mm)

| Designation | H(h) | W | L | ℓ | S | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CCKNR/L 2525M12-A4** | 25 | 25 | 150 | 29 | 32 | CNGN1204 | UH1 | SHCN4A | BM510 | LW4 |
| **CCKNR/L 2525M12-A7** | 25 | 25 | 150 | 29 | 32 | CNGN1207 | UH1 | SHCN4A | BM510 | LW4 |
| **CCKNR/L 2525M12-X7** | 25 | 25 | 150 | 29 | 32 | CNG(V)X1207 | UH5 | SHCN4A | BM510 | LW4 |
| **CCKNR/L 3225P12-A4** | 32 | 25 | 170 | 29 | 32 | CNGN1204 | UH1 | SHCN4A | BM510 | LW4 |
| **CCKNR/L 3225P12-A7** | 32 | 25 | 170 | 29 | 32 | CNGN1207 | UH1 | SHCN4A | BM510 | LW4 |
| **CCKNR/L 3225P12-X7** | 32 | 25 | 170 | 29 | 32 | CNG(V)X1207 | UH5 | SHCN4A | BM510 | LW4 |

## Available Inserts

| CNGN | CNGX | CNVX |
|---|---|---|
|  |  |  |

## Parts



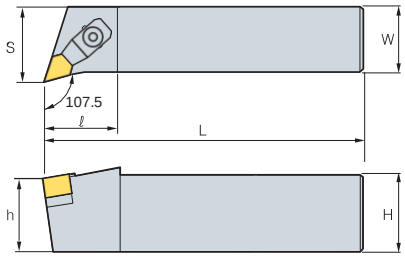
| UH1 | UH5 | SHCN4A | BM510 | LW4 |
|---|---|---|---|---|

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CDHN





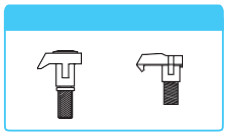

(mm)

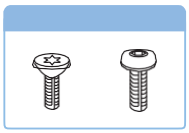
| Designation | H(h) | W | L | ℓ | S | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CDHNR/L 2525M15-A4** | 25 | 25 | 150 | 33 | 32 | DNGN1504 | UH1 | SHDN4A | BM510 | LW4 |
| **CDHNR/L 2525M15-A7** | 25 | 25 | 150 | 33 | 32 | DNGN1507 | UH1 | SHDN4A | BM510 | LW4 |
| **CDHNR/L 2525M12-X7** | 25 | 25 | 150 | 30 | 32 | DNGX1207 | UH5 | SHDN3A | TM3507 | LW4 |
| **CDHNR/L 2525M15-X7** | 25 | 25 | 150 | 33 | 32 | DNGX1507 | UH5 | SHDN4A | BM510 | LW4 |
| **CDHNR/L 3225P15-A4** | 32 | 25 | 170 | 33 | 32 | DNGN1504 | UH1 | SHDN4A | BM510 | LW4 |
| **CDHNR/L 3225P15-A7** | 32 | 25 | 170 | 33 | 32 | DNGN1507 | UH1 | SHDN4A | BM510 | LW4 |
| **CDHNR/L 3225P12-X7** | 32 | 25 | 170 | 30 | 32 | DNGX1207 | UH5 | SHDN3A | TM3507 | LW4 |
| **CDHNR/L 3225P15-X7** | 32 | 25 | 170 | 33 | 32 | DNGX1507 | UH5 | SHDN4A | BM510 | LW4 |

## Available Inserts

| DNGN | DNGX |
|---|---|
|  |  |

## Parts





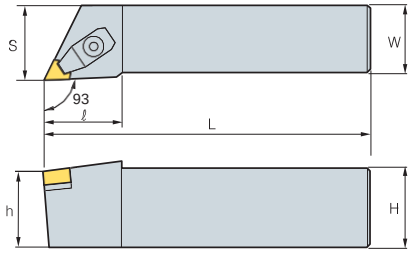

| | | | | |
|---|---|---|---|---|
| UH1 UH5 | SHDN3A SHDN4A | TM3507 BM510 | LW4 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Iron | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CDJN

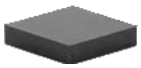




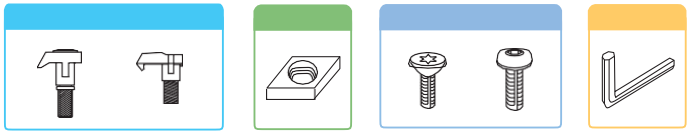

(mm)

| Designation | H(h) | W | L | ℓ | S | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CDJNR/L 2525M15-A4** | 25 | 25 | 150 | 38 | 32 | DNGN1504 | UH1 | SHDN4A | BM510 | LW4 |
| **CDJNR/L 2525M15-A7** | 25 | 25 | 150 | 38 | 32 | DNGN1507 | UH1 | SHDN4A | BM510 | LW4 |
| **CDJNR/L 2525M12-X7** | 25 | 25 | 150 | 38 | 32 | DNGX1207 | UH5 | SHDN3A | TM3507 | LW4 |
| **CDJNR/L 2525M15-X7** | 25 | 25 | 150 | 38 | 32 | DNGX1507 | UH5 | SHDN4A | BM510 | LW4 |
| **CDJNR/L 3225P15-A4** | 32 | 25 | 170 | 38 | 32 | DNGN1504 | UH1 | SHDN4A | BM510 | LW4 |
| **CDJNR/L 3225P15-A7** | 32 | 25 | 170 | 38 | 32 | DNGN1507 | UH1 | SHDN4A | BM510 | LW4 |
| **CDJNR/L 3225P12-X7** | 32 | 25 | 170 | 38 | 32 | DNGX1207 | UH5 | SHDN3A | TM3507 | LW4 |
| **CDJNR/L 3225P15-X7** | 32 | 25 | 170 | 38 | 32 | DNGX1507 | UH5 | SHDN4A | BM510 | LW4 |

## Available Inserts

| DNGN | DNGX |
|---|---|
|  |  |

## Parts



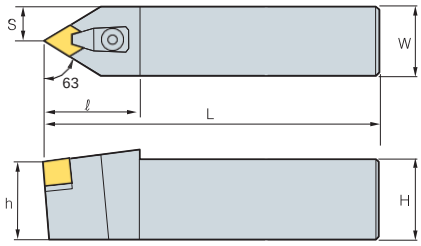
| UH1 | UH5 | SHDN3A SHDN4A | TM3507 | BM510 | LW4 |
|---|---|---|---|---|---|

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CDNN






(mm)

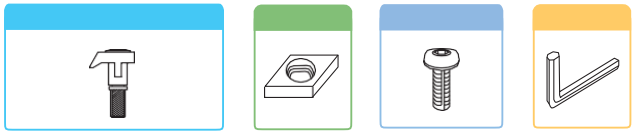
| Designation | H(h) | W | L | ℓ | S | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CDNNN 2525M15-A4** | 25 | 25 | 150 | 40 | 12.5 | DNGN1504 | UH1 | SHDN4A | BM510 | LW4 |
| **CDNNN 2525M15-A7** | 25 | 25 | 150 | 40 | 12.5 | DNGN1507 | UH1 | SHDN4A | BM510 | LW4 |
| **CDNNN 4025M15-A7** | 40 | 25 | 150 | 40 | 12.5 | DNGN1507 | UH1 | SHDN4A | BM510 | LW4 |

## Available Inserts

**DNGN**



## Parts



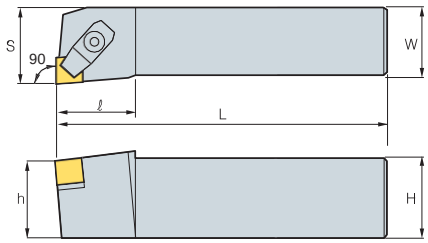
UH1 | SHDN4A | BM510 | LW4

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CEFN






(mm)

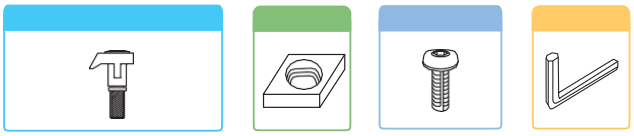
| Designation | H(h) | W | L | ℓ | S | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CEFNR/L 2525M13-A7** | 25 | 25 | 150 | 29 | 32 | ENGN1307 | UH1 | SHEN4A | BM510 | LW4 |
| **CEFNR/L 3225P13-A7** | 32 | 25 | 170 | 29 | 32 | ENGN1307 | UH1 | SHEN4A | BM510 | LW4 |

## Available Inserts

**ENGN**



## Parts



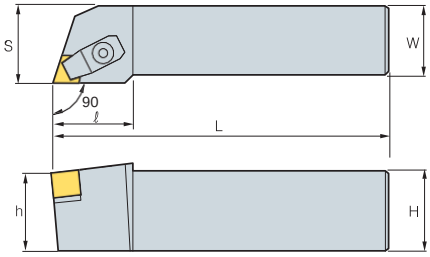
UH1 | SHEN4A | BM510 | LW4

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CEGN






(mm)

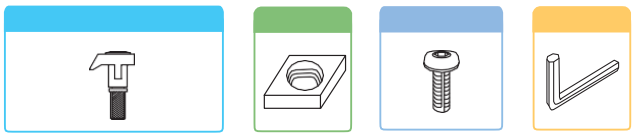
| Designation | H(h) | W | L | ℓ | S | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CEGNR/L 2525M13-A7** | 25 | 25 | 150 | 23 | 32 | ENGN1307 | UH1 | SHEN4A | BM510 | LW4 |
| **CEGNR/L 3225P13-A7** | 32 | 25 | 170 | 23 | 32 | ENGN1307 | UH1 | SHEN4A | BM510 | LW4 |

## Available Inserts

**ENGN**



## Parts



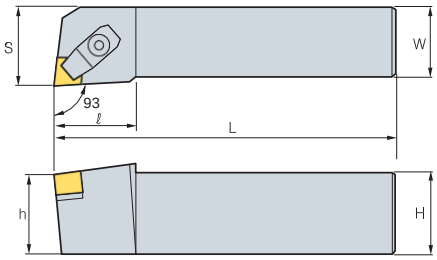
| UH1 | SHEN4A | BM510 | LW4 |
|---|---|---|---|

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CEJN






(mm)

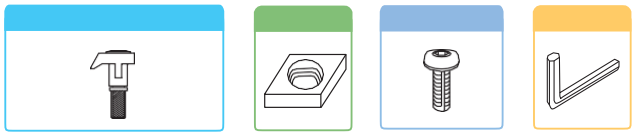
| Designation | H(h) | W | L | ℓ | S | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CEJNR/L 2525M13-A7** | 25 | 25 | 150 | 30 | 32 | ENGN1307 | UH1 | SHEN4A | BM510 | LW4 |
| **CEJNR/L 3225P13-A7** | 32 | 25 | 170 | 30 | 32 | ENGN1307 | UH1 | SHEN4A | BM510 | LW4 |

## Available Inserts

| ENGN |
|---|



## Parts



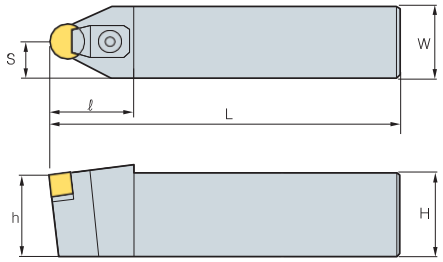
| UH1 | SHEN4A | BM510 | LW4 |
|---|---|---|---|

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CRDN





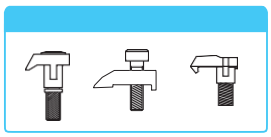
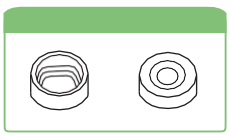
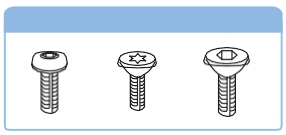

(mm)

| Designation | H(h) | W | L | ℓ | S | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CRDNN 2525M09-A4** | 25 | 25 | 150 | 32 | 12.5 | RNGN0904 | UH1 | SHRN3A | TM3507 | LW4 |
| **CRDNN 2525M09-A7** | 25 | 25 | 150 | 32 | 12.5 | RNGN0907 | UH1 | SHRN3A | TM3507 | LW4 |
| **CRDNN 2525M12-A4** | 25 | 25 | 150 | 32 | 12.5 | RNGN1204 | UH1 | SHRN4A | BM510 | LW4 |
| **CRDNN 2525M12-A7** | 25 | 25 | 150 | 32 | 12.5 | RNGN1207 | UH1 | SHRN4A | BM510 | LW4 |
| **CRDNN 2525M12-X7** | 25 | 25 | 150 | 32 | 12.5 | RNGX1207 | UH5 | SHRN4A | BM510 | LW4 |
| **CRDNN 3225P12-A4** | 32 | 25 | 170 | 32 | 12.5 | RNGN1204 | UH1 | SHRN4A | BM510 | LW4 |
| **CRDNN 3225P12-A7** | 32 | 25 | 170 | 32 | 12.5 | RNGN1207 | UH1 | SHRN4A | BM510 | LW4 |
| **CRDNN 3225P12-X7** | 32 | 25 | 170 | 32 | 12.5 | RNGX1207 | UH5 | SHRN4A | BM510 | LW4 |
| **CRDNN 3225P15-A7** | 32 | 25 | 170 | 32 | 12.5 | RNGN1507 | UH1 | SHRN5A | BM510 | LW4 |
| **CRDNN 3225P19-A7** | 32 | 25 | 170 | 32 | 12.5 | RNGN1907 | UH4 | SHRN6 | FM512 | LW6 |

## Available Inserts

| RNGN | RNGX .. DP |
|---|---|
|  |  |

## Parts

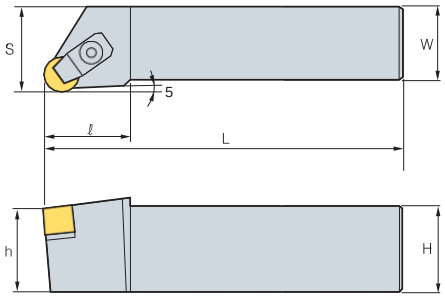

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| UH1 | UH4 | UH5 | SHRN3A | SHRN4A | SHRN5A | SHRN6 | BM510 | TM3507 | FM512 | LW4 | LW6 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CRGN





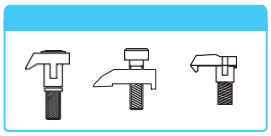
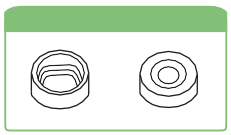
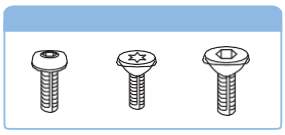

(mm)

| Designation | H(h) | W | L | ℓ | S | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CRGNR/L 2525M09-A4** | 25 | 25 | 150 | 32 | 32 | RNGN0904 | UH1 | SHRN3A | TM3507 | LW4 |
| **CRGNR/L 2525M09-A7** | 25 | 25 | 150 | 32 | 32 | RNGN0907 | UH1 | SHRN3A | TM3507 | LW4 |
| **CRGNR/L 2525M12-A4** | 25 | 25 | 150 | 35 | 32 | RNGN1204 | UH1 | SHRN4A | BM510 | LW4 |
| **CRGNR/L 2525M12-A7** | 25 | 25 | 150 | 35 | 32 | RNGN1207 | UH1 | SHRN4A | BM510 | LW4 |
| **CRGNR/L 2525M12-X7** | 25 | 25 | 150 | 35 | 32 | RNGX1207 | UH5 | SHRN4A | BM510 | LW4 |
| **CRGNR/L 3225P12-A4** | 32 | 25 | 170 | 35 | 32 | RNGN1204 | UH1 | SHRN4A | BM510 | LW4 |
| **CRGNR/L 3225P12-A7** | 32 | 25 | 170 | 35 | 32 | RNGN1207 | UH1 | SHRN4A | BM510 | LW4 |
| **CRGNR/L 3225P12-X7** | 32 | 25 | 170 | 35 | 32 | RNGX1207 | UH5 | SHRN4A | BM510 | LW4 |
| **CRGNR/L 3225P15-A7** | 32 | 25 | 170 | 37 | 32 | RNGN1507 | UH1 | SHRN5A | BM510 | LW4 |
| **CRGNR/L 3225P19-A7** | 32 | 25 | 170 | 45 | 32 | RNGN1907 | UH4 | SHRN6 | FM512 | LW6 |

## Available Inserts

| RNGN | RNGX .. DP |
|---|---|
|  |  |

## Parts

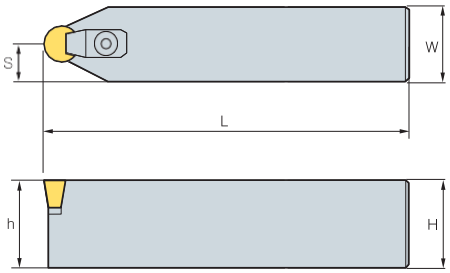

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UH1 | UH4 | UH5 | SHRN3A | SHRN4A | SHRN5A | SHRN6 | BM510 | TM3507 | FM512 | LW4 | LW6 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CRDB






(mm)

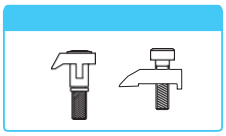
| Designation | H(h) | W | L | S | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CRDBN 2525M12-A** | 25 | 25 | 150 | 12.5 | RBGX12T | UH1 | SHRB12 | SH3015 | LW4 |
| **CRDBN 2525M16-A** | 25 | 25 | 150 | 12.5 | RBGX16T | UH1 | SHRB16 | SH3515 | LW4 |
| **CRDBN 3232P12-A** | 32 | 32 | 170 | 16 | RBGX12T | UH1 | SHRB12 | SH3015 | LW4 |
| **CRDBN 3232P16-A** | 32 | 32 | 170 | 16 | RBGX16T | UH1 | SHRB16 | SH3515 | LW4 |
| **CRDBN 3232P20-A** | 32 | 32 | 170 | 16 | RBGX20T | UH4 | SHRB20 | SH5015 | LW6 |
| **CRDBN 3232P26-A** | 32 | 32 | 170 | 16 | RBGX26T | UH4 | SHRB26 | SH6015 | LW6 |

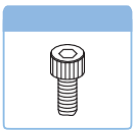
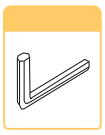
## Available Inserts

**RBGX**



## Parts



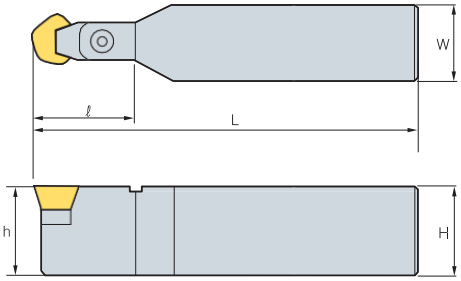
| | | | |
|---|---|---|---|
| UH1 UH4 | SHRB12<br>SHRB16<br>SHRB20<br>SHRB26 | SH3015<br>SH3515<br>SH5015<br>SH6015 | LW4<br>LW6 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CRDC






(mm)

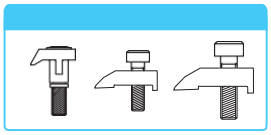
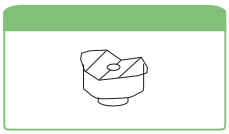
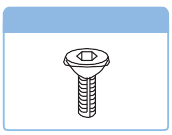
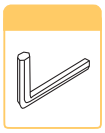
| Designation | H(h) | W | L | S | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CRDCN 3225P06-A4** | 32 | 25 | 170 | 20 | RCGX0604 | CLRC6 | SHRC102 | FM210 | LW3 |
| **CRDCN 3225P06-A6** | 32 | 25 | 170 | 20 | RCGX0606 | CLRC6 | SHRC102 | FM210 | LW3 |
| **CRDCN 3225P06-A7** | 32 | 25 | 170 | 20 | RCGX0607 | CLRC6 | SHRC102 | FM210 | LW3 |
| **CRDCN 3225P09-A7** | 32 | 25 | 170 | 20 | RCGX0907 | CLRC9 | SHRC103 | FM315 | LW4 |
| **CRDCN 3225P12-A7** | 32 | 25 | 170 | 20 | RCGX1207 | UH1 | SHRC104 | FM415 | LW4 |
| **CRDCN 5040T12-A7** | 50 | 40 | 300 | 30 | RCGX1207 | UH1 | SHRC104 | FM415 | LW4 |
| **CRDCN 5040T15-A10** | 50 | 40 | 300 | 35 | RCGX1510 | UH1 | SHRC105 | FM415 | LW4 |
| **CRDCN 5040T19-A10** | 50 | 40 | 300 | 45 | RCGX1910 | UH4 | SHRC106 | FM415 | LW6 |
| **CRDCN 5040T25-A12** | 50 | 40 | 300 | 50 | RCGX2512 | UH25 | SHRC108 | FM615 | LW6 |

## Available Inserts

**RCGX**



## Parts

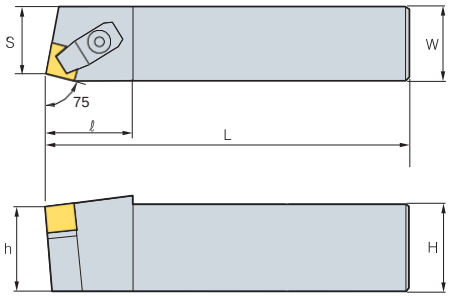
| | | | |
|---|---|---|---|
| CLRC6 CLRC9<br>UH1 UH4 UH25 | SHRC102 SHRC105<br>SHRC103 SHRC106<br>SHRC104 SHRC108 | FM210 FM415<br>FM315 FM615 | LW3<br>LW4<br>LW6 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CSBN





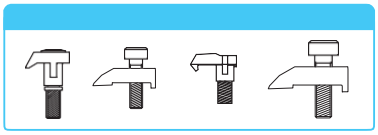

(mm)

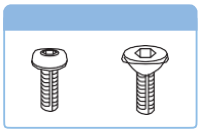
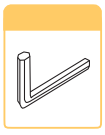
| Designation | H(h) | W | L | ℓ | S | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CSBNR/L 2525M12-A4** | 25 | 25 | 150 | 34 | 22 | SNGN1204 | UH1 | SHSN4A | BM510 | LW4 |
| **CSBNR/L 2525M12-A7** | 25 | 25 | 150 | 34 | 22 | SNGN1207 | UH1 | SHSN4A | BM510 | LW4 |
| **CSBNR/L 2525M12-X7** | 25 | 25 | 150 | 34 | 22 | SNGX1207 | UH5 | SHSN4A | BM510 | LW4 |
| **CSBNR/L 2525M15-A7** | 25 | 25 | 150 | 34 | 22 | SNGN1507 | UH1 | SHSN5A | FM512 | LW4 |
| **CSBNR/L 2525M15-X7** | 25 | 25 | 150 | 40 | 22 | SNGX1507 | UH5 | SHSN5A | FM512 | LW4 |
| **CSBNR/L 3225P12-A7** | 32 | 25 | 170 | 34 | 22 | SNGN1207 | UH1 | SHSN4A | BM510 | LW4 |
| **CSBNR/L 3225P12-X7** | 32 | 25 | 170 | 34 | 22 | SNGX1207 | UH5 | SHSN4A | BM510 | LW4 |
| **CSBNR/L 3225P15-A7** | 32 | 25 | 170 | 40 | 22 | SNGN1507 | UH1 | SHSN5A | FM512 | LW4 |
| **CSBNR/L 3225P15-X7** | 32 | 25 | 170 | 40 | 22 | SNGX1507 | UH5 | SHSN5A | FM512 | LW4 |
| **CSBNR/L 4040S19-A7** | 40 | 40 | 250 | 54 | 35 | SNGN1907 | UH4 | SHSN6A | FM612 | LW6 |
| **CSBNR/L 5050T25-A9** | 50 | 50 | 300 | 65 | 45 | SNGN2509 | UH25 | SHSN8 | FM815 | LW6 |

## Available Inserts

| SNGN | SNGX |
|---|---|
|  |  |

## Parts



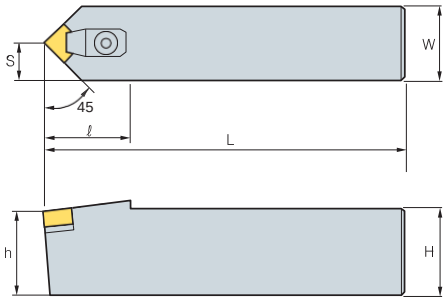
| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| UH1 | UH4 | UH5 | UH25 | SHSN4A | SHSN5A | SHSN6A | SHSN8 | BM510 | FM512 | FM612 | FM815 | LW4 | LW6 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CSDN





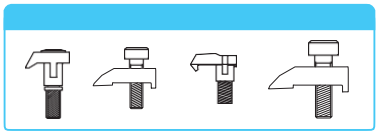
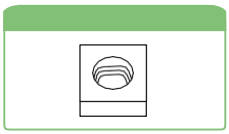
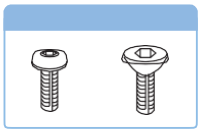
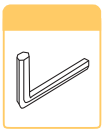

(mm)

| Designation | H(h) | W | L | ℓ | S | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CSDNN 2525M12-A4** | 25 | 25 | 150 | 35 | 12.5 | SNGN1204 | UH1 | SHSN4A | BM510 | LW4 |
| **CSDNN 2525M12-A7** | 25 | 25 | 150 | 35 | 12.5 | SNGN1207 | UH1 | SHSN4A | BM510 | LW4 |
| **CSDNN 2525M12-X7** | 25 | 25 | 150 | 35 | 12.5 | SNGX1207 | UH5 | SHSN4A | BM510 | LW4 |
| **CSDNN 2525M15-A7** | 25 | 25 | 150 | 38 | 12.5 | SNGN1507 | UH1 | SHSN5A | FM512 | LW4 |
| **CSDNN 2525M15-X7** | 25 | 25 | 150 | 38 | 12.5 | SNGX1507 | UH5 | SHSN5A | FM512 | LW4 |
| **CSDNN 3225P12-A7** | 32 | 25 | 170 | 35 | 12.5 | SNGN1207 | UH1 | SHSN4A | BM510 | LW4 |
| **CSDNN 3225P12-X7** | 32 | 25 | 170 | 35 | 12.5 | SNGX1207 | UH5 | SHSN4A | BM510 | LW4 |
| **CSDNN 3225P15-A7** | 32 | 25 | 170 | 38 | 12.5 | SNGN1507 | UH1 | SHSN5A | FM512 | LW4 |
| **CSDNN 3225P15-X7** | 32 | 25 | 170 | 38 | 12.5 | SNGX1507 | UH5 | SHSN5A | FM512 | LW4 |
| **CSDNN 4040S19-A7** | 40 | 40 | 250 | 60 | 20 | SNGN1907 | UH4 | SHSN6A | FM612 | LW6 |
| **CSDNN 5050T25-A9** | 50 | 50 | 300 | 60 | 25 | SNGN2509 | UH25 | SHSN8 | FM815 | LW6 |

## Available Inserts

| SNGN | SNGX |
|---|---|
|  |  |

## Parts

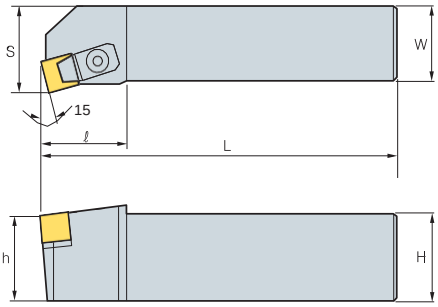
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| UH1 | UH4 | UH5 | UH25 | SHSN4A | SHSN6A | BM510 | FM512 | LW4 |
| | | | | SHSN5A | SHSN8 | | FM612 | LW6 |
| | | | | | | | FM815 | |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CSKN






(mm)

| Designation | H(h) | W | L | ℓ | S | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CSKNR/L 2525M12-A4** | 25 | 25 | 150 | 34 | 32 | SNGN1204 | UH1 | SHSN4A | BM510 | LW4 |
| **CSKNR/L 2525M12-A7** | 25 | 25 | 150 | 34 | 32 | SNGN1207 | UH1 | SHSN4A | BM510 | LW4 |
| **CSKNR/L 2525M12-X7** | 25 | 25 | 150 | 34 | 32 | SNGX1207 | UH5 | SHSN4A | BM510 | LW4 |
| **CSKNR/L 2525M15-A7** | 25 | 25 | 150 | 40 | 32 | SNGN1507 | UH1 | SHSN5A | FM512 | LW4 |
| **CSKNR/L 2525M15-X7** | 25 | 25 | 150 | 40 | 32 | SNGX1507 | UH5 | SHSN5A | FM512 | LW4 |
| **CSKNR/L 3225P12-A7** | 32 | 25 | 170 | 34 | 32 | SNGN1207 | UH1 | SHSN4A | BM510 | LW4 |
| **CSKNR/L 3225P12-X7** | 32 | 25 | 170 | 34 | 32 | SNGX1207 | UH5 | SHSN4A | BM510 | LW4 |
| **CSKNR/L 3225P15-A7** | 32 | 25 | 170 | 40 | 32 | SNGN1507 | UH1 | SHSN5A | FM512 | LW4 |
| **CSKNR/L 3225P15-X7** | 32 | 25 | 170 | 40 | 32 | SNGX1507 | UH5 | SHSN5A | FM512 | LW4 |

## Available Inserts

| SNGN | SNGX |
|---|---|
|  |  |

## Parts



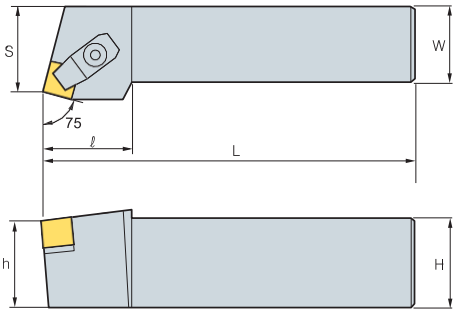
| UH1 | UH5 | SHSN4A<br>SHSN5A | BM510 | FM512 | LW4 |
|---|---|---|---|---|---|

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CSRN





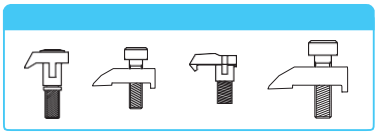

(mm)

| Designation | H(h) | W | L | ℓ | S | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CSRNR/L 2525M12-A4** | 25 | 25 | 150 | 32 | 27 | SNGN1204 | UH1 | SHSN4A | BM510 | LW4 |
| **CSRNR/L 2525M12-A7** | 25 | 25 | 150 | 32 | 27 | SNGN1207 | UH1 | SHSN4A | BM510 | LW4 |
| **CSRNR/L 2525M12-X7** | 25 | 25 | 150 | 32 | 27 | SNGX1207 | UH5 | SHSN4A | BM510 | LW4 |
| **CSRNR/L 2525M15-A7** | 25 | 25 | 150 | 34 | 27 | SNGN1507 | UH1 | SHSN5A | FM512 | LW4 |
| **CSRNR/L 2525M15-X7** | 25 | 25 | 150 | 34 | 27 | SNGX1507 | UH5 | SHSN5A | FM512 | LW4 |
| **CSRNR/L 3225P12-A7** | 32 | 25 | 170 | 32 | 27 | SNGN1207 | UH1 | SHSN4A | BM510 | LW4 |
| **CSRNR/L 3225P12-X7** | 32 | 25 | 170 | 32 | 27 | SNGX1207 | UH5 | SHSN4A | BM510 | LW4 |
| **CSRNR/L 3225P15-A7** | 32 | 25 | 170 | 34 | 27 | SNGN1507 | UH1 | SHSN5A | FM512 | LW4 |
| **CSRNR/L 3225P15-X7** | 32 | 25 | 170 | 34 | 27 | SNGX1507 | UH5 | SHSN5A | FM512 | LW4 |
| **CSRNR/L 4040S19-A7** | 40 | 40 | 250 | 54 | 43 | SNGN1907 | UH4 | SHSN6A | FM612 | LW6 |
| **CSRNR/L 5050T25-A9** | 50 | 50 | 300 | 70 | 53 | SNGN2509 | UH25 | SHSN8 | FM815 | LW6 |

## Available Inserts

| SNGN | SNGX |
|---|---|
|  |  |

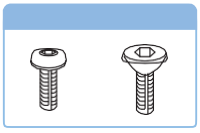
## Parts



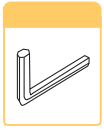
UH1 UH4 UH5 UH25



SHSN4A SHSN6A
SHSN5A SHSN8



BM510 FM512
FM612
FM815



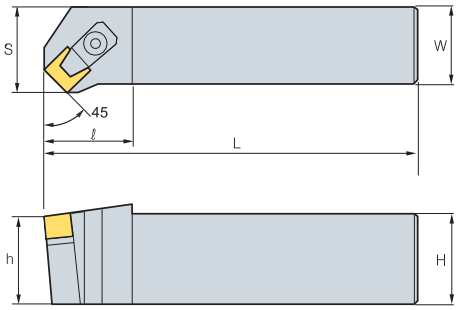
LW4
LW6

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CSSN





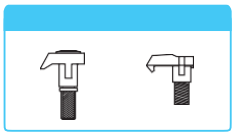

(mm)

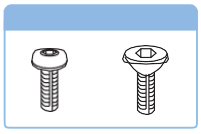
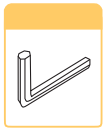
| Designation | H(h) | W | L | ℓ | S | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CSSNR/L 2525M12-A4** | 25 | 25 | 150 | 35 | 32 | SNGN1204 | UH1 | SHSN4A | BM510 | LW4 |
| **CSSNR/L 2525M12-A7** | 25 | 25 | 150 | 35 | 32 | SNGN1207 | UH1 | SHSN4A | BM510 | LW4 |
| **CSSNR/L 2525M12-X7** | 25 | 25 | 150 | 35 | 32 | SNGX1207 | UH5 | SHSN4A | BM510 | LW4 |
| **CSSNR/L 2525M15-A7** | 25 | 25 | 150 | 37 | 32 | SNGN1507 | UH1 | SHSN5A | FM512 | LW4 |
| **CSSNR/L 2525M15-X7** | 25 | 25 | 150 | 37 | 32 | SNGX1507 | UH5 | SHSN5A | FM512 | LW4 |
| **CSSNR/L 3225P12-A7** | 32 | 25 | 170 | 35 | 32 | SNGN1207 | UH1 | SHSN4A | BM510 | LW4 |
| **CSSNR/L 3225P12-X7** | 32 | 25 | 170 | 35 | 32 | SNGX1207 | UH5 | SHSN4A | BM510 | LW4 |
| **CSSNR/L 3225P15-A7** | 32 | 25 | 170 | 37 | 32 | SNGN1507 | UH1 | SHSN5A | FM512 | LW4 |
| **CSSNR/L 3225P15-X7** | 32 | 25 | 170 | 37 | 32 | SNGX1507 | UH5 | SHSN5A | FM512 | LW4 |

## Available Inserts

| SNGN | SNGX |
|---|---|
|  |  |

## Parts



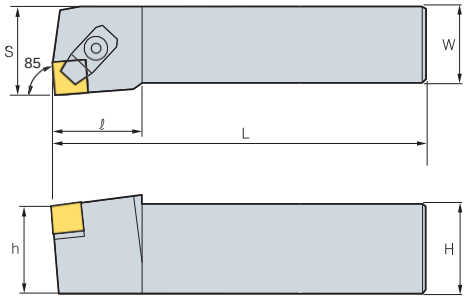
| UH1 UH5 | SHSN4A SHSN5A | BM510 FM512 | LW4 |
|---|---|---|---|

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CSYN





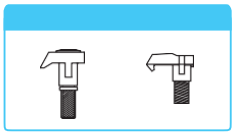

(mm)

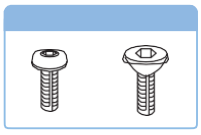
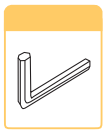
| Designation | H(h) | W | L | ℓ | S | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CSYNR/L 2525M12-A4** | 25 | 25 | 150 | 27 | 32 | SNGN1204 | UH1 | SHSN4A | BM510 | LW4 |
| **CSYNR/L 2525M12-A7** | 25 | 25 | 150 | 27 | 32 | SNGN1207 | UH1 | SHSN4A | BM510 | LW4 |
| **CSYNR/L 2525M12-X7** | 25 | 25 | 150 | 27 | 32 | SNGX1207 | UH5 | SHSN4A | BM510 | LW4 |
| **CSYNR/L 2525M15-A7** | 25 | 25 | 150 | 27 | 32 | SNGN1507 | UH1 | SHSN5A | FM512 | LW4 |
| **CSYNR/L 2525M15-X7** | 25 | 25 | 150 | 27 | 32 | SNGX1507 | UH5 | SHSN5A | FM512 | LW4 |
| **CSYNR/L 3225P12-A7** | 32 | 25 | 170 | 27 | 32 | SNGN1207 | UH1 | SHSN4A | BM510 | LW4 |
| **CSYNR/L 3225P12-X7** | 32 | 25 | 170 | 27 | 32 | SNGX1207 | UH5 | SHSN4A | BM510 | LW4 |
| **CSYNR/L 3225P15-A7** | 32 | 25 | 170 | 27 | 32 | SNGN1507 | UH1 | SHSN5A | FM512 | LW4 |
| **CSYNR/L 3225P15-X7** | 32 | 25 | 170 | 27 | 32 | SNGX1507 | UH5 | SHSN5A | FM512 | LW4 |

## Available Inserts

| SNGN | SNGX |
|---|---|
|  |  |

## Parts



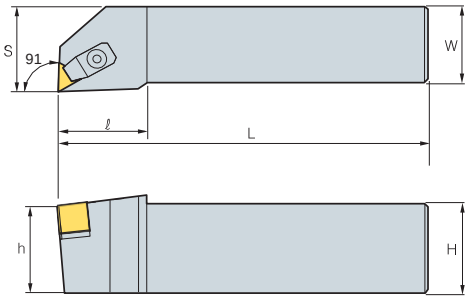
| UH1 | UH5 | SHSN4A SHSN5A | BM510 | FM512 | LW4 |
|---|---|---|---|---|---|

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CTFN






(mm)

| Designation | H(h) | W | L | ℓ | S | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CTFNR/L 2525M16-A4** | 25 | 25 | 150 | 29 | 32 | TNGN1604 | UH1 | SHTN3A | BM408 | LW4 |
| **CTFNR/L 2525M16-A7** | 25 | 25 | 150 | 29 | 32 | TNGN1607 | UH1 | SHTN3A | BM408 | LW4 |
| **CTFNR/L 2525M22-A4** | 25 | 25 | 150 | 32 | 32 | TNGN2204 | UH1 | SHTN4 | FM410 | LW4 |
| **CTFNR/L 2525M22-A7** | 25 | 25 | 150 | 32 | 32 | TNGN2207 | UH1 | SHTN4 | FM410 | LW4 |
| **CTFNR/L 3225P16-A4** | 32 | 25 | 170 | 29 | 32 | TNGN1604 | UH1 | SHTN3A | BM408 | LW4 |
| **CTFNR/L 3225P16-A7** | 32 | 25 | 170 | 29 | 32 | TNGN1607 | UH1 | SHTN3A | BM408 | LW4 |
| **CTFNR/L 3225P22-A4** | 32 | 25 | 170 | 32 | 32 | TNGN2204 | UH1 | SHTN4 | FM410 | LW4 |
| **CTFNR/L 3225P22-A7** | 32 | 25 | 170 | 32 | 32 | TNGN2207 | UH1 | SHTN4 | FM410 | LW4 |

## Available Inserts

**TNGN**



## Parts



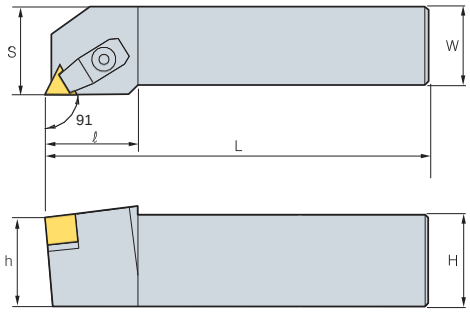
| UH1 | SHTN3A | SHTN4A | BM408 | FM410 | LW4 |
|---|---|---|---|---|---|

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CTGN






(mm)

| Designation | H(h) | W | L | ℓ | S | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CTGNR/L 2525M16-A4** | 25 | 25 | 150 | 26 | 32 | TNGN1604 | UH1 | SHTN3A | BM408 | LW4 |
| **CTGNR/L 2525M16-A7** | 25 | 25 | 150 | 26 | 32 | TNGN1607 | UH1 | SHTN3A | BM408 | LW4 |
| **CTGNR/L 2525M22-A4** | 25 | 25 | 150 | 26 | 32 | TNGN2204 | UH1 | SHTN4 | FM410 | LW4 |
| **CTGNR/L 2525M22-A7** | 25 | 25 | 150 | 26 | 32 | TNGN2207 | UH1 | SHTN4 | FM410 | LW4 |
| **CTGNR/L 3225P16-A4** | 32 | 25 | 170 | 26 | 32 | TNGN1604 | UH1 | SHTN3A | BM408 | LW4 |
| **CTGNR/L 3225P16-A7** | 32 | 25 | 170 | 26 | 32 | TNGN1607 | UH1 | SHTN3A | BM408 | LW4 |
| **CTGNR/L 3225P22-A4** | 32 | 25 | 170 | 26 | 32 | TNGN2204 | UH1 | SHTN4 | FM410 | LW4 |
| **CTGNR/L 3225P22-A7** | 32 | 25 | 170 | 26 | 32 | TNGN2207 | UH1 | SHTN4 | FM410 | LW4 |

## Available Inserts

**TNGN**



## Parts



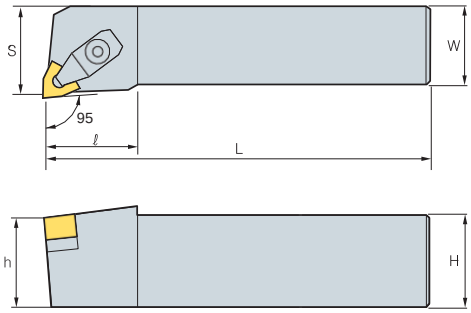
| | | | | | |
|---|---|---|---|---|---|
| UH1 | SHTN3A | SHTN4A | BM408 | FM410 | LW4 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CWLN






(mm)

| Designation | H(h) | W | L | ℓ | S | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CWLNR/L 2525M08-X7** | 25 | 25 | 150 | 28 | 32 | WNGX0807 | UH5 | SHWN4A | TM4010 | LW4 |
| **CWLNR/L 3225M08-X7** | 32 | 25 | 150 | 28 | 32 | WNGX0807 | UH5 | SHWN4A | TM4010 | LW4 |

## Available Inserts

**WNGX**



## Parts



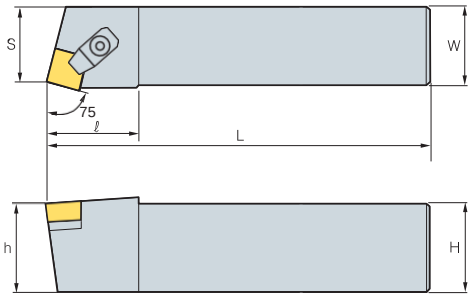
| UH5 | SHWN4A | TM4010 | LW4 |
|---|---|---|---|

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CSRC






(mm)

| Designation | H(h) | W | L | ℓ | S | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CSRCR/L 2525M12-A4** | 25 | 25 | 150 | 32 | 27 | SCGN1204 | UH1 | SHSC4A | SP3 | LW4 |
| **CSRCR/L 3225P12-A4** | 32 | 25 | 170 | 32 | 27 | SCGN1204 | UH1 | SHSC4A | SP3 | LW4 |

## Available Inserts

**SCGN**



## Parts



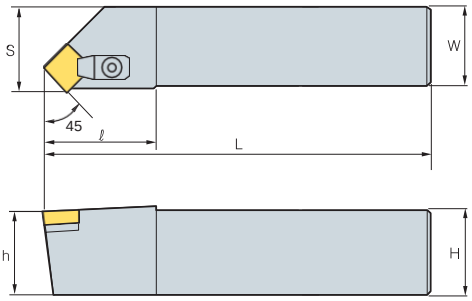
| UH1 | SHSC4A | SP3 | LW4 |
|---|---|---|---|

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CSSC






(mm)

| Designation | H(h) | W | L | ℓ | S | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CSSCR/L 2525M12-A4** | 25 | 25 | 150 | 35 | 32 | SCGN1204 | UH1 | SHSC4A | SP3 | LW4 |
| **CSSCR/L 2525M12-A6** | 25 | 25 | 150 | 35 | 32 | SCGN1206 | UH1 | SHSC4A | SP3 | LW4 |
| **CSSCR/L 3225P12-A4** | 32 | 25 | 170 | 35 | 32 | SCGN1204 | UH1 | SHSC4A | SP3 | LW4 |
| **CSSCR/L 3225P12-A6** | 32 | 25 | 170 | 35 | 32 | SCGN1206 | UH1 | SHSC4A | SP3 | LW4 |

## Available Inserts

**SCGN**



## Parts



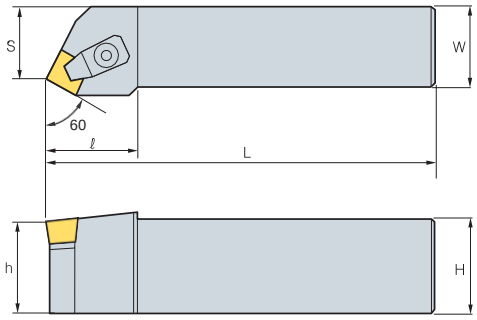
| UH1 | SHSC4A | SP3 | LW4 |
|---|---|---|---|

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CSTP






(mm)

| Designation | H(h) | W | L | ℓ | S | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CSTPR/L 2020K09-A3** | 20 | 20 | 125 | 24 | 17 | SPGN0903 | UH1 | SHSC3A | SP3 | LW4 |
| **CSTPR/L 2020K12-A3** | 20 | 20 | 125 | 30 | 17 | SPGN1203 | UH1 | SHSC4A | SP3 | LW4 |
| **CSTPR/L 2020K12-A4** | 20 | 20 | 125 | 30 | 17 | SPGN1204 | UH1 | SHSC4A | SP3 | LW4 |
| **CSTPR/L 2525M12-A3** | 25 | 25 | 150 | 30 | 22 | SPGN1203 | UH1 | SHSC4A | SP3 | LW4 |
| **CSTPR/L 2525M12-A4** | 25 | 25 | 150 | 30 | 22 | SPGN1204 | UH1 | SHSC4A | SP3 | LW4 |

## Available Inserts

| SPGN |
|---|



## Parts



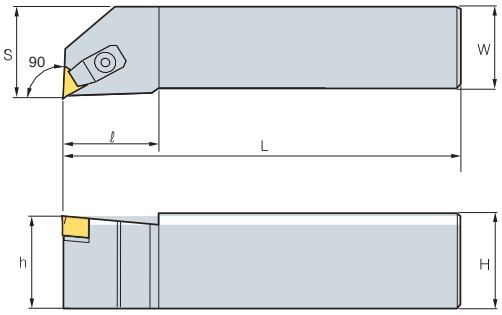
| UH1 | SHSC3A<br>SHSC4A | SP3 | LW4 |
|---|---|---|---|

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CTFP






(mm)

| Designation | H(h) | W | L | ℓ | S | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CTFPR/L 2020K16-A3** | 20 | 20 | 125 | 20 | 25 | TPGN1603 | UH1 | SHTC3A | SP3 | LW4 |
| **CTFPR/L 2525M16-A3** | 25 | 25 | 150 | 20 | 32 | TPGN1603 | UH1 | SHTC3A | SP3 | LW4 |

## Available Inserts

| TPGN |
|---|
|  |

## Parts



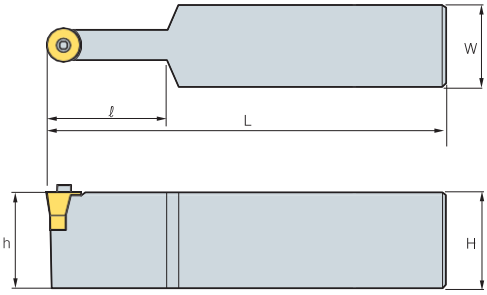
| UH1 | SHTC3A | SP3 | LW3<br>LW4 |
|---|---|---|---|

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# HRCD






(mm)

| Designation | H(h) | W | L | ℓ | Insert | Parts | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Clamp & Clamp Screw | Shim | Wrench |
| **HRCD 2525M12-B6** | 25 | 25 | 150 | 15 | CDH1206 | HB2 | SHCD22 | LW2.5 |
| **HRCD 2525M19-B9** | 25 | 25 | 150 | 15 | CDH1909 | HB3 | SHCD33 | LW5 |
| **HRCD 3225R19-B9** | 32 | 25 | 200 | 38 | CDH1909 | HB3 | SHCD33 | LW5 |
| **HRCD 4035S19-B9** | 40 | 35 | 250 | 45 | CDH1909 | HB3 | SHCD33 | LW5 |
| **HRCD 4035S32-B19** | 40 | 35 | 250 | 45 | CDH3219 | HB5 | SHCD53 | LW6 |
| **HRCD 5050T32-B19** | 50 | 50 | 300 | 50 | CDH3219 | HB5 | SHCD53 | LW6 |

## Available Inserts

| CDH |
|---|
|  |

## Parts

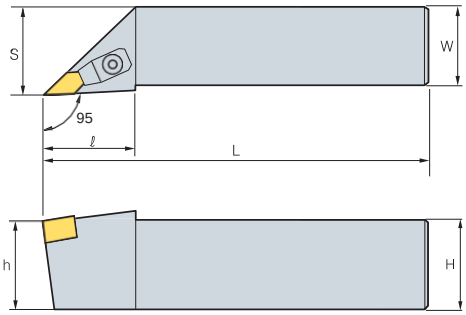
| Clamp & Clamp Screw | | |
|---|---|---|
|  |  |  |
| HB2<br>HB3<br>HB5 | SHCD22<br>SHCD33<br>SHCD53 | LW2.5<br>LW5<br>LW6 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CVJN





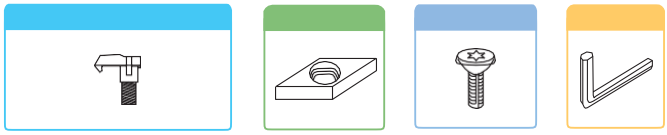

(mm)

| Designation | H(h) | W | L | ℓ | S | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CVJNR/L 2525M16-A4** | 25 | 25 | 150 | 41 | 32 | VNGN1604 | SM4 | SHVN3A | TM412 | LW4 |
| **CVJNR/L 2525M16-X7** | 25 | 25 | 150 | 41 | 32 | VNGX1607 | SM4 | SHVN3A | TM412 | LW4 |
| **CVJNR/L 3225P16-X7** | 32 | 25 | 170 | 41 | 32 | VNGX1607 | SM4 | SHVN3A | TM412 | LW4 |

## Available Inserts

| VNGN | VNGX |
|---|---|
|  |  |

## Parts



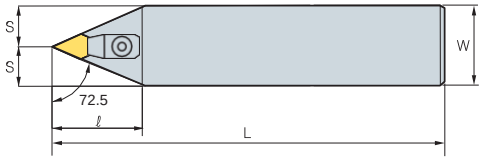
| SM4 | SHVN3A | TM412 | LW4 |
|---|---|---|---|

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CVVN









(mm)

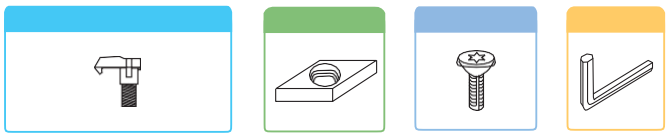
| Designation | H(h) | W | L | ℓ | S | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CVVNN 2525M16-X7** | 25 | 25 | 150 | 45 | 12.5 | VNGX1607 | SM4 | SHVN3A | TM412 | LW4 |
| **CVVNN 3225P16-X7** | 32 | 25 | 170 | 45 | 12.5 | VNGX1607 | SM4 | SHVN3A | TM412 | LW4 |

## Available Inserts

| VNGX |
|---|



## Parts



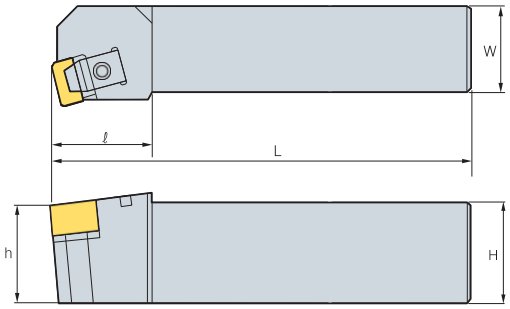
| SM4 | SHVN3A | TM412 | LW4 |
|---|---|---|---|

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CLKN






(mm)

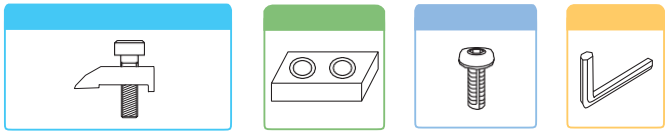
| Designation | H(h) | W | L | ℓ | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CLKNR/L 6060V65-A** | 60 | 60 | 400 | 70 | LNJ6588 | UH25 | SHLJ65 | BM510 | LW6 |
| **CLKNR/L 6060V66-A** | 60 | 60 | 400 | 70 | LNJ6688 | UH25 | SHLJ66 | BM510 | LW6 |

## Available Inserts

**LNJ**



## Parts



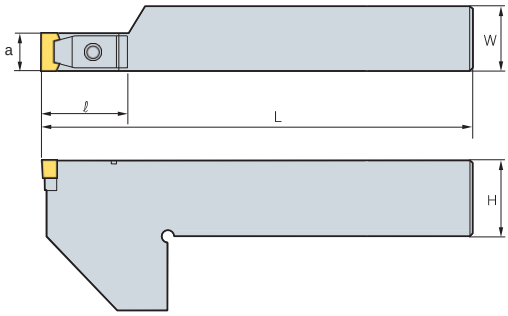
| UH25 | SHLJ65<br>SHLJ66 | BM510 | LW6 |
|---|---|---|---|

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# CFLN





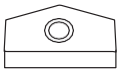

(mm)

| Designation | a | H | W | L | ℓ | Insert | Parts | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clamp & Clamp Screw | Shim | Shim Screw | Wrench |
| **CFLNN 6060U44-A** | 14 | 60 | 60 | 350 | 80 | F10537 | UH25 | SHF10 | BM510 | LW6 |
| **CFLNN 5050T32-A** | 12 | 50 | 50 | 300 | 75 | F13941 | UH25 | SHF13 | BM510 | LW6 |
| **CFLNN 4040R25-A** | 7 | 40 | 40 | 200 | 40 | F250723 | UH4 | SHF25 | BM510 | LW4 |

## Available Inserts

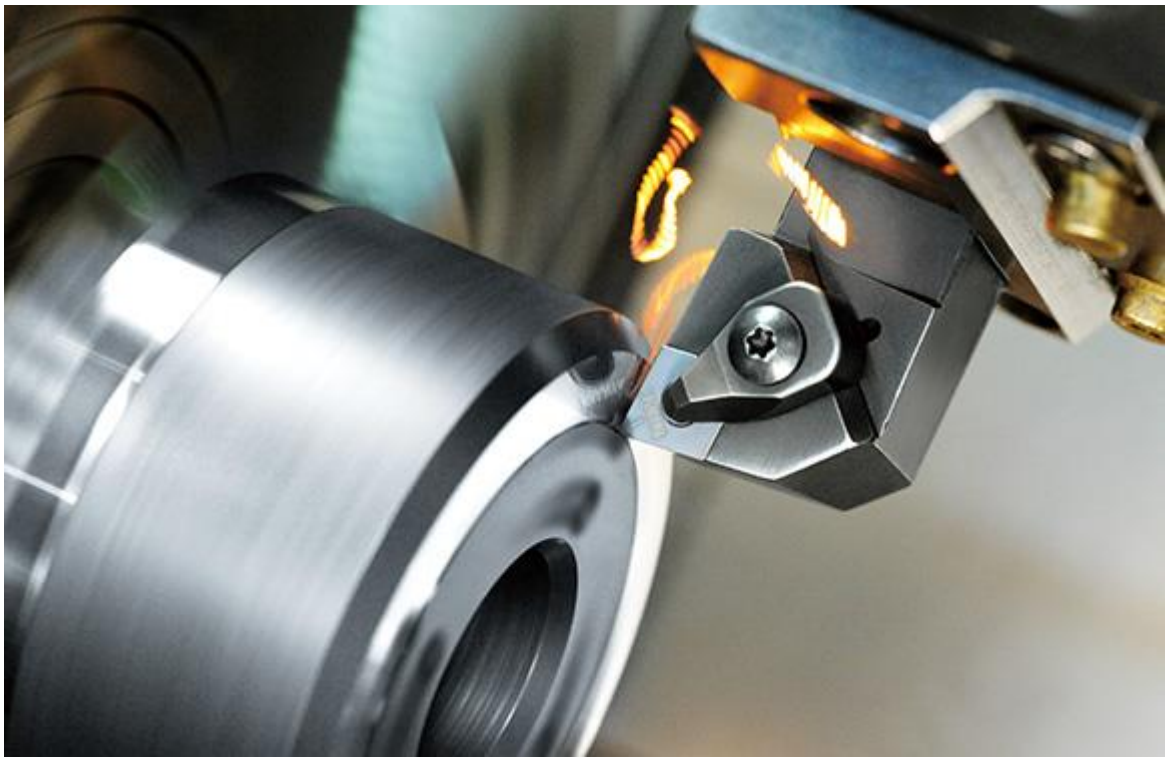
| F-Series | F-Series |
|---|---|
|  |  |

## Parts

| Clamp & Clamp Screw | | Shim | Shim Screw | Wrench |
|---|---|---|---|---|
|  |  |  |  |  |
| UH4 | UH25 | SHF10<br>SHF13<br>SHF25 | BM510 | LW6 |

## Star Guide Key to Recommended Tools

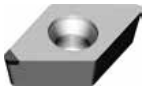
| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

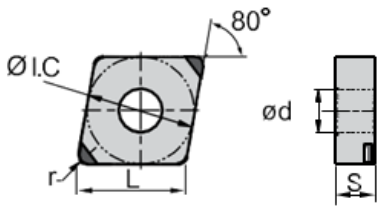




| | Insert Shape *Schneidplattenform* | Type *Typ* | Grade *Sorte* | | | |
|---|---|---|---|---|---|---|
| | | | BN200 | BN201 | BN202 | BN203 |
| Negative Insert |  | CNGA120404-2 | ○ | ○ | ○ | ○ |
| | | CNGA120408-2 | ○ | ○ | ○ | ○ |
| | | CNGA120412-2 | ○ | ○ | ○ | ○ |
| | | CNGA120408-2W | ○ | ○ | | |
| | | CNGA120412-2W | ○ | ○ | | |
| |  | DNGA150604-2 | ○ | ○ | ○ | ○ |
| | | DNGA150608-2 | ○ | ○ | ● | ○ |
| | | DNGA150612-2 | ○ | ● | ○ | |
| |  | SNGA120408-2 | ○ | ○ | ○ | ○ |
| | | SNGA120412-2 | ○ | ○ | ○ | ○ |
| |  | TNGA160404-3 | ○ | ○ | | |
| | | TNGA160408-3 | ○ | ○ | ○ | ○ |
| | | TNGA160412-3 | ○ | ○ | ○ | ○ |
| |  | VNGA160404-2 | ○ | ● | | |
| | | VNGA160408-2 | ○ | ○ | | |
| |  | WNGA080404-3 | ○ | ○ | ○ | |
| | | WNGA080408-3 | ○ | ○ | ○ | |
| | | WNGA080412-3 | ○ | ○ | ○ | ○ |
| Positive Inserts |  | CCGW060204-1 | ○ | ○ | | |
| | | CCGW060208-1 | | ○ | | |
| | | CCGW09T304-2 | ○ | ○ | ○ | ○ |
| | | CCGW09T308-2 | ○ | ○ | ○ | ○ |
| | | CCGW120404-2 | ○ | ○ | ○ | |
| | | CCGW120408-2 | ○ | ○ | ○ | |
| |  | DCGW070202-1 | ○ | ● | | |
| | | DCGW070204-1 | ○ | ● | | |
| | | DCGW070208-1 | ○ | ● | | |
| | | DCGW11T304-2 | ○ | ○ | ○ | ○ |
| | | DCGW11T308-2 | ○ | ● | ○ | ○ |
| |  | TCGW110204-1 | ○ | ○ | ○ | ○ |
| | | TCGW110208-1 | ○ | ○ | ○ | |
| | | TCGW16T304-3 | ○ | ○ | ○ | ○ |
| | | TCGW16T308-3 | ○ | ○ | ○ | ○ |
| |  | VBGW160404-2 | ○ | ○ | | ○ |
| | | | ○ | ○ | | ○ |
| |  | VCGW160404-2 | ○ | ○ | | ○ |
| | | VCGW160408-2 | ○ | ○ | | ○ |

# PCD

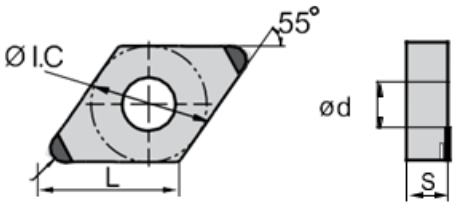
| Insert Shape<br>*Schneidplattenform* | Type<br>*Typ* | Grade<br>*Sorte*<br>**CN300** |
|---|---|---|
|  | **CCGT060202**** | ● |
| | **CCGT060204**** | ● |
| | **CCGT09T304**** | ● |
| | **CCGT09T308**** | ○ |
| | **CCGT120404**** | ● |
| | **CCGT120408**** | ○ |
|  | **CCGW060202**** | ● |
| | **CCGW060204**** | ● |
| | **CCGW09T304**** | ● |
| | **CCGW09T308**** | ● |
| | **CCGW120404**** | ● |
| | **CCGW120408**** | ● |
|  | **DCGT070202**** | ● |
| | **DCGT070204**** | ● |
| | **DCGT11T302**** | ● |
| | **DCGT11T304**** | ● |
| | **DCGT11T308**** | ● |
|  | **DCGW070202**** | ● |
| | **DCGW070204**** | ● |
| | **DCGW070208**** | ● |
| | **DCGW11T302**** | ● |
| | **DCGW11T304**** | ● |
| | **DCGW11T308**** | ● |
|  | **TCGT110202**** | ○ |
| | **TCGT110204**** | ○ |
| | **TCGT110208**** | ○ |
| | **TCGT16T304**** | ○ |
| | **TCGT16T308**** | ○ |
|  | **TCGW110208**** | ○ |
| | **TCGW16T302**** | ○ |
| | **TCGW16T304**** | ○ |
| | **TCGW16T308**** | ○ |
|  | **VBGT160402**** | ○ |
| | **VBGT160404**** | ○ |
| | **VBGT160408**** | ○ |
|  | **VBGW160404**** | ● |
| | **VBGW160408**** | ● |
|  | **VCGT160402**** | ○ |
| | **VCGT160404**** | ● |
| | **VCGT160408**** | ● |
|  | **VCGW160404**** | ● |
| | **VCGW160408**** | ● |




| | |
|---|---|
| H | Hardened material |
| K | Cast iron |
| N | Non-ferrite material |

| Type | Grades | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|
| ISO | BN200 | BN201 | BN202 | CN300 | BN203 | S | IC | r | d1 |
| CNGA120404-2 | ◆◆ | | | | | 4.76 | 12.7 | 0.4 | 5.16 |
| CNGA120408-2 | ◆◆ | | | | | 4.76 | 12.7 | 0.8 | 5.16 |
| CNGA120412-2 | ◆◆ | | | | | 4.76 | 12.7 | 1.2 | 5.16 |
| CNGA120408-2W | ◆◆ | | | | | 4.76 | 12.7 | 0.8 | 5.16 |
| CNGA120412-2W | ◆◆ | | | | | 4.76 | 12.7 | 1.2 | 5.16 |

# DNGA



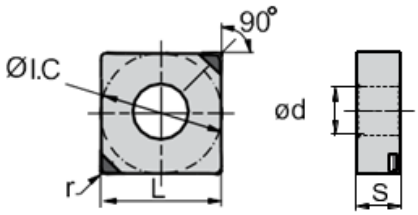

| | |
|---|---|
| H | Hardened material |
| K | Cast iron |
| N | Non-ferrite material |

| Type | Grades | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|
| ISO | BN200 | BN201 | BN202 | CN300 | BN203 | S | IC | r | d1 |
| DNGA150604-2 | ◆◆ | | | | | 6.35 | 12.7 | 0.4 | 5.16 |
| DNGA150608-2 | ◆◆ | | | | | 6.35 | 12.7 | 0.8 | 5.16 |
| DNGA150612-2 | ◆◆ | | | | | 6.35 | 12.7 | 1.2 | 5.16 |
| DNGA150404-2 | ◆◆ | | | | | 4.76 | 12.7 | 0.4 | 5.16 |
| DNGA150408-2 | ◆◆ | | | | | 4.76 | 12.7 | 0.8 | 5.16 |
| DNGA150412-2 | ◆◆ | | | | | 4.76 | 12.7 | 1.2 | 5.16 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

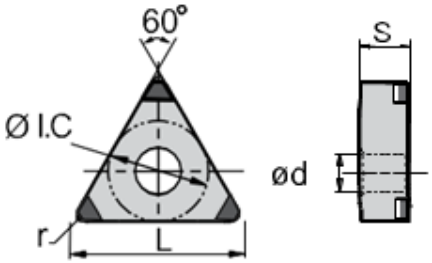
# SNGA




| | |
|---|---|
| H | Hardened material |
| K | Cast iron |
| N | Non-ferrite material |

| Type | Grades | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|
| ISO | BN200 | BN201 | BN202 | CN300 | BN203 | S | IC | r | d1 |
| SNGA120404-2 | ◆◆ | | | | | 4.76 | 12.7 | 0.4 | 4.76 |
| SNGA120408-2 | ◆◆ | | | | | 4.76 | 12.7 | 0.8 | 4.76 |
| SNGA120412-2 | ◆◆ | | | | | 4.76 | 12.7 | 1.2 | 4.76 |
| SNGA120404-4 | ◆◆ | | | | | 4.76 | 12.7 | 0.4 | 4.76 |
| SNGA120408-4 | ◆◆ | | | | | 4.76 | 12.7 | 0.8 | 4.76 |
| SNGA120412-4 | ◆◆ | | | | | 4.76 | 12.7 | 1.2 | 4.76 |

# TNGA



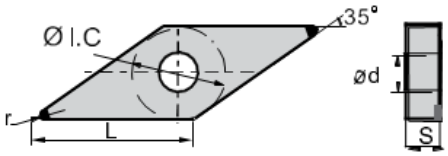

| | |
|---|---|
| H | Hardened material |
| K | Cast iron |
| N | Non-ferrite material |

| Type | Grades | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|
| ISO | BN200 | BN201 | BN202 | CN300 | BN203 | S | IC | r | d1 |
| TNGA160404-3 | ◆◆ | | | | | 4.76 | 9.525 | 0.4 | 3.81 |
| TNGA160408-3 | ◆◆ | | | | | 4.76 | 9.525 | 0.8 | 3.81 |
| TNGA1604012-3 | ◆◆ | | | | | 4.76 | 9.525 | 1.2 | 3.81 |
| TNGA160404-6 | ◆◆ | | | | | 4.76 | 9.525 | 0.4 | 3.81 |
| TNGA160408-6 | ◆◆ | | | | | 4.76 | 9.525 | 0.8 | 3.81 |
| TNGA1604012-6 | ◆◆ | | | | | 4.76 | 9.525 | 1.2 | 3.81 |

## Star Guide Key to Recommended Tools

| Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

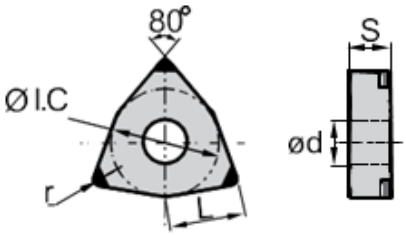
# VNGA




| | |
|---|---|
| H | Hardened material |
| K | Cast iron |
| N | Non-ferrite material |

| Type | Grades | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|
| ISO | BN200 | BN201 | BN202 | CN300 | BN203 | S | IC | r | d1 |
| VNGA160404-2 | ◆◆ | | | | | 4.76 | 9.525 | 0.4 | 3.81 |
| VNGA160408-2 | ◆◆ | | | | | 4.76 | 9.625 | 0.8 | 3.81 |
| VNGA160404-4 | ◆◆ | | | | | 4.76 | 9.525 | 0.4 | 3.81 |
| VNGA160408-4 | ◆◆ | | | | | 4.76 | 9.625 | 0.8 | 3.81 |

# WNGA



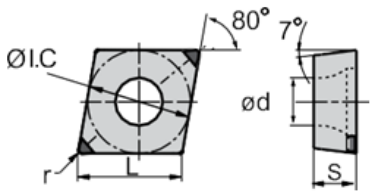

| | |
|---|---|
| H | Hardened material |
| K | Cast iron |
| N | Non-ferrite material |

| Type | Grades | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|
| ISO | BN200 | BN201 | BN202 | CN300 | BN203 | S | IC | r | d1 |
| WNGA080404-3 | ◆◆ | | | | | 4.76 | 12.7 | 0.4 | 4.76 |
| WNGA060408-3 | ◆◆ | | | | | 4.76 | 12.7 | 0.8 | 4.76 |
| WNGA080812-3 | ◆◆ | | | | | 4.76 | 12.7 | 1.2 | 4.76 |
| WNGA080404-6 | ◆◆ | | | | | 4.76 | 12.7 | 0.4 | 4.76 |
| WNGA060408-6 | ◆◆ | | | | | 4.76 | 12.7 | 0.8 | 4.76 |
| WNGA080812-6 | ◆◆ | | | | | 4.76 | 12.7 | 1.2 | 4.76 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

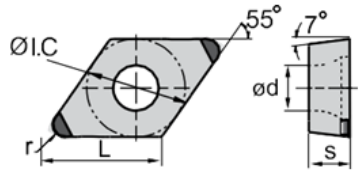
# CCGW




| | |
|---|---|
| H | Hardened material |
| K | Cast iron |
| N | Non-ferrite material |

| Type | Grades | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|
| ISO | BN200 | BN201 | BN202 | CN300 | BN203 | S | IC | r | d1 |
| CCGW060204-1 | ◆◆ | | | | | 2.38 | 6.35 | 0.4 | 2.8 |
| CCGW060208-1 | ◆◆ | | | | | 2.38 | 6.35 | 0.8 | 2.8 |
| CCGW09T304-2 | ◆◆ | | | | | 3.97 | 9.525 | 0.4 | 4.4 |
| CCGW09T308-2 | ◆◆ | | | | | 3.97 | 9.525 | 0.8 | 4.4 |
| CCGW120404-2 | ◆◆ | | | | | 4.76 | 12.7 | 0.4 | 5.5 |
| CCGW120408-2 | ◆◆ | | | | | 4.76 | 12.7 | 0.8 | 5.5 |

# DCGW



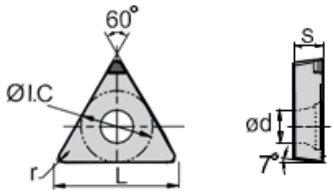

| | |
|---|---|
| H | Hardened material |
| K | Cast iron |
| N | Non-ferrite material |

| Type | Grades | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|
| ISO | BN200 | BN201 | BN202 | CN300 | BN203 | S | IC | r | d1 |
| DCGW070204-1 | ◆◆ | | | | | 2.38 | 6.35 | 0.4 | 2.8 |
| DCGW070208-1 | ◆◆ | | | | | 2.38 | 6.35 | 0.8 | 2..8 |
| DCGW11T304-2 | ◆◆ | | | | | 3.97 | 9.525 | 0.4 | 3.97 |
| DCGW11T308-2 | ◆◆ | | | | | 3.97 | 9.525 | 0.8 | 3.97 |

## Star Guide Key to Recommended Tools

| Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

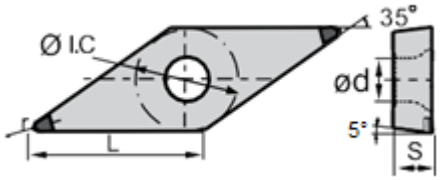
# TCGW




| | |
|---|---|
| H | Hardened material |
| K | Cast iron |
| N | Non-ferrite material |

| Type | Grades | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|
| ISO | BN200 | BN201 | BN202 | CN300 | BN203 | S | IC | r | d1 |
| TCGW110204-1 | ◆◆ | | | | | 2.38 | 5.56 | 0.4 | 2.5 |
| TCGW110208-1 | ◆◆ | | | | | 2.38 | 5.56 | 0.8 | 2.5 |
| TCGW16T304-3 | ◆◆ | | | | | 3.97 | 9.525 | 0.4 | 4.4 |
| TCGW16T308-3 | ◆◆ | | | | | 3.97 | 9.525 | 0.8 | 4.4 |

# VBGW

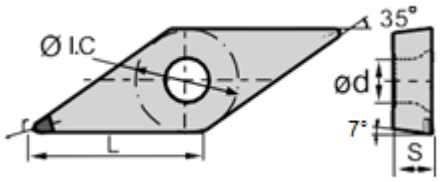



| | |
|---|---|
| H | Hardened material |
| K | Cast iron |
| N | Non-ferrite material |

| Type | Grades | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|
| ISO | BN200 | BN201 | BN202 | CN300 | BN203 | S | IC | r | d1 |
| VBGW160404-1 | ◆◆ | | | | | 4.76 | 9.525 | 0.4 | 4.4 |
| VBGW160408-1 | ◆◆ | | | | | 4.76 | 9.525 | 0.8 | 4.4 |
| VBGW160404-2 | ◆◆ | | | | | 4.76 | 9.525 | 0.4 | 4.4 |
| VBGW160408-2 | ◆◆ | | | | | 4.76 | 9.525 | 0.8 | 4.4 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |



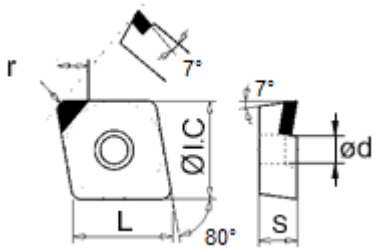

| | |
|---|---|
| H | Hardened material |
| K | Cast iron |
| N | Non-ferrite material |

| Type | Grades | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|
| ISO | BN200 | BN201 | BN202 | CN300 | BN203 | S | IC | r | d1 |
| VCGW160404-1 | ◆◆ | | | | | 4.76 | 9.525 | 0.4 | 4.4 |
| VCGW160408-1 | ◆◆ | | | | | 4.76 | 9.525 | 0.8 | 4.4 |
| VCGW160404-2 | ◆◆ | | | | | 4.76 | 9.525 | 0.4 | 4.4 |
| VCGW160408-2 | ◆◆ | | | | | 4.76 | 9.525 | 0.8 | 4.4 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

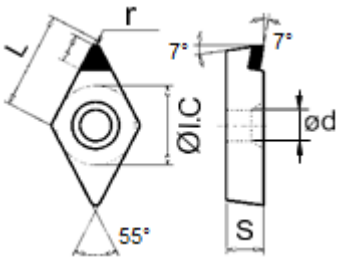
# CCGT




| | |
|---|---|
| H | Hardened material |
| K | Cast iron |
| N | Non-ferrite material |

| Type | Grades | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|
| ISO | BN200 | BN201 | BN202 | CN300 | BN203 | S | IC | r | d1 |
| CCGT060202** | | | | ◆ | | 2,38 | 6.35 | 0.2 | 2.8 |
| CCGT060204** | | | | ◆ | | 2,38 | 6.35 | 0.4 | 2.8 |
| CCGT09T304** | | | | ◆ | | 3.97 | 9.525 | 0.4 | 4.4 |
| CCGT09T308** | | | | ◆ | | 3.97 | 9.525 | 0.8 | 4.4 |
| CCGT120404** | | | | ◆ | | 4.76 | 12.7 | 0.4 | 5.56 |
| CCGT120408** | | | | ◆ | | 4.76 | 12.7 | 0.8 | 5.56 |

# DCGT



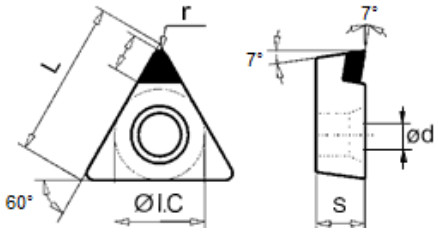

| | |
|---|---|
| H | Hardened material |
| K | Cast iron |
| N | Non-ferrite material |

| Type | Grades | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|
| ISO | BN200 | BN201 | BN202 | CN300 | BN203 | S | IC | r | d1 |
| DCGT070202** | | | | ◆ | | 3.8 | 6.35 | 0.2 | 2.8 |
| DCGT070204** | | | | ◆ | | 3.8 | 6.35 | 0.4 | 2.8 |
| DCGT11T302** | | | | ◆ | | 3.97 | 9.525 | 0.2 | 4.4 |
| DCGT11T304** | | | | ◆ | | 3.97 | 9.525 | 0.4 | 4.4 |
| DCGT11T308** | | | | ◆ | | 3.97 | 9.525 | 0.8 | 4.4 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

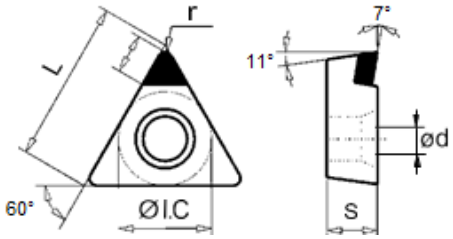
# TCGT




| | |
|---|---|
| H | Hardened material |
| K | Cast iron |
| N | Non-ferrite material |

| Type | Grades | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|
| ISO | BN200 | BN201 | BN202 | CN300 | BN203 | S | IC | r | d1 |
| TCGT110202** | | | | ◆ | | 2,38 | 6.35 | 0.2 | 2.8 |
| TCGT110204** | | | | ◆ | | 2,38 | 6.35 | 0.4 | 2.8 |
| TCGT110208** | | | | ◆ | | 2.38 | 6.35 | 0.8 | 2.8 |
| TCGT16T304** | | | | ◆ | | 3.97 | 9.525 | 0.4 | 4.4 |
| TCGT16T308** | | | | ◆ | | 3.97 | 9.525 | 0.8 | 4.4 |

# TPGT



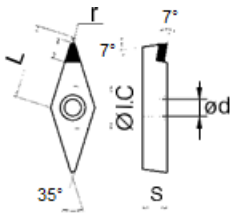

| | |
|---|---|
| H | Hardened material |
| K | Cast iron |
| N | Non-ferrite material |

| Type | Grades | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|
| ISO | BN200 | BN201 | BN202 | CN300 | BN203 | S | IC | r | d1 |
| TPGT110202** | | | | ◆ | | 2,38 | 6.35 | 0.2 | 2.8 |
| TPGT110204** | | | | ◆ | | 2,38 | 6.35 | 0.4 | 2.8 |
| TPGT110208** | | | | ◆ | | 2.38 | 6.35 | 0.8 | 2.8 |
| TPGT16T304** | | | | ◆ | | 3.97 | 9.525 | 0.4 | 4.4 |
| TPGT16T308** | | | | ◆ | | 3.97 | 9.525 | 0.8 | 4.4 |
| TPGT110304** | | | | ◆ | | 3.18 | 6.35 | 0.4 | 2.8 |
| TPGT110308** | | | | ◆ | | 3.18 | 6.35 | 0.8 | 2.8 |

## Star Guide Key to Recommended Tools

| Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# VCGT




| | |
|---|---|
| H | Hardened material |
| K | Cast iron |
| N | Non-ferrite material |

| Type | Grades | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|
| ISO | BN200 | BN201 | BN202 | CN300 | BN203 | S | IC | r | $d_1$ |
| VCGT160402** | | | | ◆ | | 4.76 | 9.525 | 0.2 | 4.4 |
| VCGT160408** | | | | ◆ | | 4.76 | 9.525 | 0.4 | 4.4 |
| VCGT160408** | | | | ◆ | | 4.76 | 9.525 | 0.8 | 4.4 |

# VBGT

| | |
|---|---|
| H | Hardened material |
| K | Cast iron |
| N | Non-ferrite material |

| Type | Grades | | | | | Dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|
| ISO | BN200 | BN201 | BN202 | CN300 | BN203 | S | IC | r | $d_1$ |
| VBGT160402** | | | | ◆ | | 4.76 | 9.525 | 0.2 | 4.4 |
| VBGT160408** | | | | ◆ | | 4.76 | 9.525 | 0.4 | 4.4 |
| VBGT160408** | | | | ◆ | | 4.76 | 9.525 | 0.8 | 4.4 |

## Star Guide Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# Recommended cutting condition CBN – PCD

| Application | Grade | Workpiece | | Speed (V) (m/min) | Feed (f) (mm/rev) | Depth (DOC) (mm) |
|---|---|---|---|---|---|---|
| Turning | BN200 BN201 BN202 | Gray Cast Iron | Continuous cutting at high speed | 130~250 | 0.03~0.15 | 0.03~0.2 |
| | | | Medium and low interrupted cutting | 80~120 | 0.03~0.15 | 0.03~0.2 |
| | | Steel | Continuous cutting at high speed | 130~250 | 0.03~0.15 | 0.03~0.2 |
| | | | Medium and low interrupted cutting | 80~120 | 0.03~0.15 | 0.03~0.2 |
| | BN203 | High interrupted cutting | | 80~110 | 0.03~0.15 | 0.03~0.2 |
| Turning | CN300 | Copper, Bronze alloy | | ~ 1000 | 0.05 ~ 0.2 | ~ 3 |
| | | Aluminum alloy (4%~8% Si) | | 1000~3000 | 0.1 ~ 0.6 | ~ 3 |
| | CN300 | Aluminum alloy (15%~18%Si) | | 300 ~ 700 | 0.1 ~ 0.4 | ~ 3 |
| | CN300 | Reinforced plastic | | ~ 1000 | 0.1 ~ 0.3 | ~ 2 |

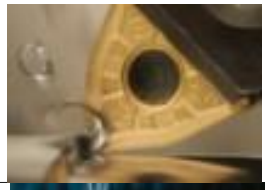
## Star Guide  Key to Recommended Tools

| | Material Designations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P | Unalloyed Steels | M | Stainless Steels | K | Cast Irons | S | High Temp. Alloys |
| | P | Alloyed Steels | M | PH Stainless | N | Aluminum & Alloys | H | Hard Materials |

# Answering Your Tooling Needs

Stellram's comprehensive tooling programme is supported by a wealth of technical knowledge and development across all products.


**Turning : P02**



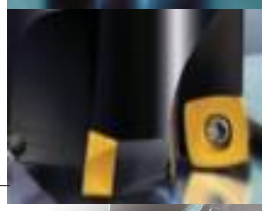
**Threading : P 76**



**Drilling ; P124**



**Milling : P148**



**CERAMICS : P173**



**CBN-PCD : P239**





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