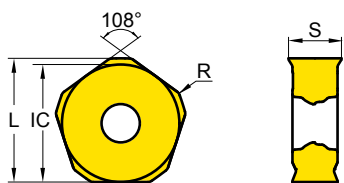


Milling - Face Milling - Inserts

PNMU - Face Milling Negative (10 Corners)


| Series | KRINS | IC | S |
|-----------|-------|------|------|
| PNMU 1206 | 36 | 14.0 | 5.84 |



EDP 1200..

●: Stock item ○: Order made item

| | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|
| P25 | P30 | P20 | P30 | P40 | K15 | K15 |
| M30 | K30 | | M40 | H15 | | K15 |
| S20 | | | | | | |

| PNMU | Designation | RE (mm) | Fz (mm/tooth) | BS (mm) | YG602 | YG622 | YG712 | YG713 | YG613 | YG501 | YG5020 |
|---|-------------|---------|---------------|---------|-----------|-------|-----------|-----------|-----------|-------|-----------|
| PNMU General  | PNMU1206ZNN | 0.8 | 0.05~0.50 | 2.10 | ● 0535 | | ● 0596 | ● 0645 | ● 0671 | | ● 0534 |
| | | | | | | | | | | | |

| Cutting Speed | | | Vc (m/min.) | | | | | | | | | | | | | |
|---------------|-------|----------------------------|-------------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|--------|-----|
| ISO | VDI | Sub Group | YG602 | | YG622 | | YG712 | | YG713 | | YG613 | | YG501 | | YG5020 | |
| | | | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max |
| P | 1-5 | Non-Alloyed Steel | 180 | 380 | 140 | 400 | 170 | 300 | 200 | 300 | 100 | 210 | - | - | - | - |
| | 6-9 | Low-Alloyed Steel | 120 | 300 | 120 | 320 | 180 | 250 | 170 | 270 | 70 | 180 | - | - | - | - |
| | 10-11 | High-Alloyed Steel | 70 | 150 | 70 | 170 | 100 | 140 | 85 | 145 | 40 | 90 | - | - | - | - |
| M | 12-13 | Ferritic & Martensitic | 120 | 200 | - | - | - | - | - | - | 70 | 180 | - | - | - | - |
| | 14 | Austenitic Stainless Steel | 130 | 250 | - | - | - | - | - | - | 70 | 200 | - | - | - | - |
| K | 15-16 | Grey Cast Iron | 120 | 250 | 120 | 270 | - | - | - | - | - | - | 160 | 300 | 200 | 350 |
| | 17-18 | Nodular Cast Iron | 130 | 220 | 130 | 240 | - | - | - | - | - | - | 130 | 210 | 150 | 300 |
| N | 21-30 | Non-Ferrous Metals (Al) | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| S | 31-37 | Superalloys & Titanium | 25 | 45 | - | - | - | - | - | - | - | - | - | - | - | - |
| H | 38-41 | Hard Materials | 40 | 80 | 40 | 100 | - | - | - | - | - | - | - | - | - | - |

Insert ISO Code System

TURNING

PARTING & GROOVING











MILLING

DRILLING



TECHNICAL INFORMATION

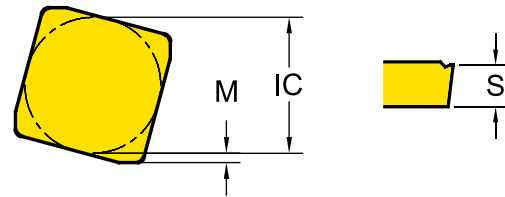
| | | | | | | |
|-------------------------------|---|-----------------------------------|--|--------------------------------------|---|---------------------------------------|
| 1 A Shape | 2 P Relief Angle (AN) | 3 K Tolerance | 4 T Clamping & Chipbreaker | 5 16 Insert Size | 6 04 Insert Thickness (S) | 7 08 CornerRadius |
|-------------------------------|---|-----------------------------------|--|--------------------------------------|---|---------------------------------------|

1 - Shape

| Symbol | Shape | |
|----------|-------------------|---|
| H | Hexagonal |  |
| O | Octagonal |  |
| P | Pentagonal |  |
| S | Square |  |
| T | Triangular |  |
| V | Rhombic 35° |  |
| W | Trigon |  |
| L | Rectangular |  |
| A | Parallelogram 80° |  |
| R | .Round |  |

2 - Relief Angle (AN)

| Symbol | Relief Angle (AN) | |
|----------|-------------------|---|
| N | No Relief Angle |  |
| B | Relief 5° |  |
| C | Relief 7° | |
| P | Relief 11° | |
| D | Relief 15° | |
| E | Relief 20° | |
| F | Relief 25° | |
| O | Special | |








3 - Tolerance Class

| Symbol | Inner Circle IC (mm) | Nose Height M (mm) | Thickness S (mm) |
|-----------|----------------------|--------------------|------------------|
| C | ± 0.025 | ± 0.013 | ± 0.025 |
| E | ± 0.025 | ± 0.025 | ± 0.025 |
| G | ± 0.025 | ± 0.025 | ± 0.13 |
| H | ± 0.013 | ± 0.013 | ± 0.025 |
| K* | ± 0.05~0.15* | ± 0.013 | ± 0.025 |
| M* | ± 0.05~0.15* | ± 0.08~0.2* | ± 0.13 |
| U* | ± 0.08~0.25* | ± 0.13~0.38* | ± 0.13 |

* Tolerance is different by insert IC size. Please see ISO 1832

4 - Clamping & Chipbreaker

| Symbol | Clamping | Chipbreaker | Figure |
|----------|------------------|-------------|---|
| N | No clamping hole | X |  |
| R | | One Face |  |
| W | Screw Hole | X |  |
| T | | One Face |  |
| U | | Both Faces |  |
| X | Special | | |

5 - Insert Size

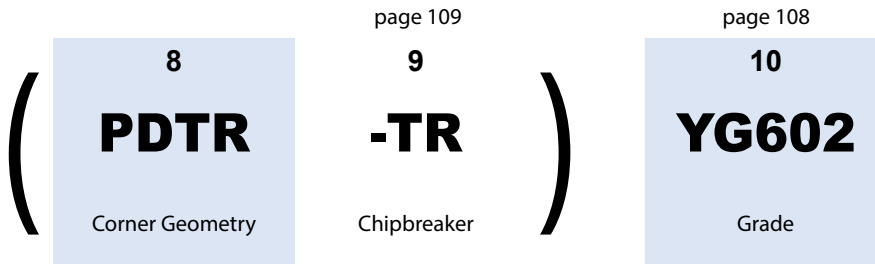
* No Standard for milling insert size

6 - Insert Thickness

* No Standard for milling insert thickness

Milling - Code System

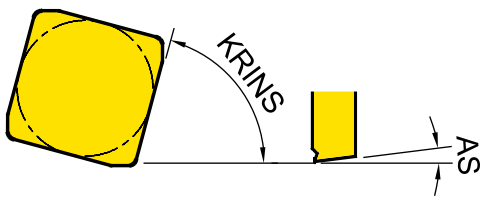
Insert ISO Code System



7 - Corner Radius (RE)

| Symbol | Thickness - S (mm) | Symbol | Thickness - S (mm) |
|-----------|--------------------|-----------|--------------------|
| 04 | 0.4 | 16 | 1.6 |
| 08 | 0.8 | 20 | 2.0 |
| 12 | 1.2 | 24 | 2.4 |

8 - Corner Geometry



| 8-1 P | 8-2 D | 8-3 T | 8-4 R |
|----------------------------|---------------------------|-----------------|-----------------|
| Cutting Edge Angle (KRINS) | Wiper Edge Clearance (AS) | Edge Condition | Feed Direction |

*Refer to page. 109 for -AL, -ST, -TR... types

8-1 - Cutting Edge Angle (KRINS)

| Symbol | Cutting Edge Angle (KRINS) |
|----------|----------------------------|
| P | 90° |
| A | 45° |
| D | 60° |
| E | 75° |
| F | 85° |
| Z | Special |

8-3 - Edge Condition

| Symbol | Edge Condition |
|----------|-----------------------|
| F | Sharp |
| E | Rounded |
| T | Chamfered |
| S | Chamfered and Rounded |

8-2 - Wiper Edge Clearance (AS)

| Symbol | Wiper Edge Clearance (AS) |
|----------|---------------------------|
| N | 0° |
| P | 11° |
| D | 15° |
| E | 20° |
| F | 25° |
| Z | Special |

8-4 - Feed Direction

| Symbol | Feed Direction |
|----------|-------------------|
| R | Right-hand Insert |
| N | Neutral Insert |
| L | Left-hand Insert |

Milling Grades and Chipbreakers

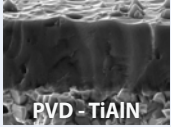
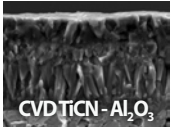
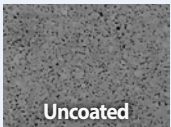
Milling Grades

| Milling Grades | P Steel | | | | | M Stainless steel | | | | K Cast iron | | | | N Non-ferrous | | | | S Superalloys | | | | |
|----------------|---------|-----|-----|-----|-----|-------------------|-----|-----|-----|-------------|-----|-----|-----|---------------|-----|-----|-----|---------------|-----|-----|-----|--|
| | P05 | P15 | P25 | P35 | P45 | M05 | M15 | M25 | M35 | K05 | K15 | K25 | K35 | N05 | N15 | N25 | N35 | S05 | S15 | S25 | S35 | |
| PVD | YG602 | | 602 | | | | 602 | | | | 602 | | | | | | | | 602 | | | |
| | YG622 | | 622 | | | | | | | | 622 | | | | | | | | | | | |
| | YG712 | | 712 | | | | | | | | | | | | | | | | | | | |
| | YG713 | | 713 | | | | | | | | | | | | | | | | | | | |
| | YG613 | | | 613 | | | | 613 | | | | | | | | | | | | | | |
| | YG501 | | | | | | | | | | 501 | | | | | | | | | | | |
| CVD | YG5020 | | | | | | | | | 5020 | | | | | | | | | | | | |
| Uncoated | YG50 | | | | | | | | | | | | | 50 | | | | | | | | |






| | | |
|---|----------------------|---|
| <p>YG602</p> <p>P20 - P35 M20 - M40</p> <p>K20 - K40 S15 - S25</p> | <p>PVD - TiAlN</p> | <p>Universal grade for General Milling Application</p> <ul style="list-style-type: none"> • Ultra Dense PVD Coating with optimal thermal resistance & strength • Sub-Micron substrate designed for demanding application |
| <p>YG622</p> <p>P20 - P40</p> <p>K20 - K40</p> | <p>PVD - AlCrN</p> | <p>Optimized Grade for High Alloyed or Prehardened Steel</p> <p>Excellent hot hardness and oxidation resistance at high speed</p> |
| <p>YG712</p> <p>P10 - P30</p> | <p>PVD - TiAlCrN</p> | <p>Milling Grade for Medium of Steel Application</p> <ul style="list-style-type: none"> • Superior wear resistance and excellent toughness in high speed machining • Coating layer with high hardness and oxidation resistance |
| <p>YG713</p> <p>P15 - P25</p> | <p>PVD - TiAlN</p> | <p>Milling Grade for General Steel Application</p> <ul style="list-style-type: none"> • Multi-layer TiAlN structure realizes stronger crater and flank wear resistance • Fine-grained carbide and balanced substrate |
| <p>YG613</p> <p>P30 - P50</p> <p>M30 - M40</p> | <p>PVD - TiAlN</p> | <p>Milling Grade for Stainless Steel Application</p> <ul style="list-style-type: none"> • New coating layer with high toughness and lubrication on ultra fine grain substrate with high toughness. • The toughest substrates provides excellent cutting performance in stainless steel |

Milling Grades and Chipbreakers

Milling Grades

| | | |
|---|---|---|
| <p>YG501 K05 - K25 H05 - H25</p> |  <p>PVD - TiAlN</p> | <p>Hard Milling grade for Cast Iron</p> <ul style="list-style-type: none"> • Substrate especially designed for high wear resistance • Excellent wear resistance in cast iron milling application |
| <p>YG5020 K01 - K30</p> |  <p>CVD TiCN - Al₂O₃</p> | <p>CVD Milling grade for Cast Iron</p> <ul style="list-style-type: none"> • CVD coating for Excellent wear resistance • Improved Toughness for chipping resistance |
| <p>YG50 N05 - N20</p> |  <p>Uncoated</p> | <p>Uncoated Milling Grade for Aluminium</p> <ul style="list-style-type: none"> • Submicron carbide substrate for high wear resistance • Preventing built up edge with shining surface |

Milling Chipbreakers

| | | |
|--|---|--|
| <p>-AL</p> |  | <ul style="list-style-type: none"> • For Aluminum • Very Sharp Geometry |
| <p>-ST</p> |  | <ul style="list-style-type: none"> • For Stainless Steel, Super Alloy • Sharp Geometry |
| <p>General Inserts (No Description)</p> |  | <ul style="list-style-type: none"> • First Choice for General Application |
| <p>-TR</p> |  | <ul style="list-style-type: none"> • For Hardened Steels • Reinforced Geometry |
| <p>...W / ...N</p> |  | <ul style="list-style-type: none"> • For Hardened Material and Cast Irons |