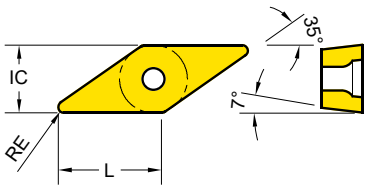
YGTURN

Turning Inserts - Positive

# VCMT / VCGT (35° Positive)

| Series | L | IC | S |
|---|---|---|---|
| VC** 1103 | 10.63 | 6.350 | 3.18 |
| VC** 1604 | 15.80 | 9.525 | 4.76 |




EDP 2200.. ●: Stock item ○: Order made item

| VCGT VCMT | | Designation | RE | Fn (mm/rev.) | Ap (mm) | K10 | P05 K20 | P10 K30 | P15 | P20 | P30 M20 | P20 | M15 S10 | M30 S20 | M40 S30 | S10 | N20 | N20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | YG1010 | YG1001 | YG3010 | YG3015 | YG3020 | YG3030 | YG801 | YG211 | YG213 | YG214 | YG401 | YG100 | YG10 |
| -AL |  Aluminum | VCGT 110301 -AL | 0.1 | 0.02 ~ 0.20 | 0.2 ~ 2.0 | | | | | | | | | | | | | ● 1041 |
| | | VCGT 110302 -AL | 0.2 | 0.02 ~ 0.20 | 0.2 ~ 2.0 | | | | | | | | | | | | | ● 1042 |
| | | VCGT 110304 -AL | 0.4 | 0.05 ~ 0.25 | 0.2 ~ 3.0 | | | | | | | | | | | | | ● 1518 |
| | | VCGT 160402 -AL | 0.2 | 0.02 ~ 0.05 | 0.5 ~ 1.0 | | | | | | | | | | | | ● 0418 | ● 0417 |
| | | VCGT 160404 -AL | 0.4 | 0.05 ~ 0.25 | 0.5 ~ 2.0 | | | | | | | | | | | | ● 0336 | ● 0087 |
| | | VCGT 160408 -AL | 0.8 | 0.10 ~ 0.35 | 1.0 ~ 3.0 | | | | | | | | | | | | ● 0420 | ● 0419 |
| -UF |  Finishing | VCMT 160404 - UF | 0.4 | 0.05 ~ 0.25 | 0.5 ~ 2.0 | | | ● 0716 | | ● 0421 | ● 0955 | | | | | | | |
| | | VCMT 160408 - UF | 0.8 | 0.05 ~ 0.25 | 1.0 ~ 2.0 | | | ● 0557 | | ● 0558 | | | | | | | | |
| -UG |  General | VCMT 160404 - UG | 0.4 | 0.10 ~ 0.20 | 0.3 ~ 2.5 | | | | | | | ● 0060 | | | | | | |
| | | VCMT 160408 - UG | 0.8 | 0.15 ~ 0.30 | 0.8 ~ 2.5 | | | ● 0946 | | ● 0422 | ● 0956 | ● 0061 | | | | | | |

| Cutting Speed | | | Vc (m/min.) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | VDI | Sub Group | YG1010 | | YG1001 | | YG3010 | | YG3015 | | YG3020 | | YG3030 | | YG801 | | YG211 | | YG213 | | YG214 | | YG401 | | YG100 | | YG10 | |
| | | | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max |
| P | 1~5 | Non-Alloyed Steel | - | - | 220 | 480 | 230 | 450 | 200 | 430 | 160 | 380 | 130 | 350 | 120 | 200 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6~9 | Low-Alloyed Steel | - | - | 220 | 420 | 180 | 380 | 150 | 350 | 140 | 320 | 130 | 280 | 70 | 200 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 10~11 | High-Alloyed Steel | - | - | - | - | 60 | 200 | 90 | 180 | 60 | 130 | 70 | 110 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| M | 12~13 | Ferritic & Martensitic | - | - | - | - | - | - | - | - | - | - | 110 | 220 | - | - | 170 | 270 | 120 | 180 | 100 | 150 | - | - | - | - | - | - |
| | 14 | Austenitic Stainless Steel | - | - | - | - | - | - | - | - | - | - | 50 | 150 | - | - | 150 | 230 | 40 | 160 | 100 | 150 | - | - | - | - | - | - |
| K | 15~16 | Grey Cast Iron | 300 | 450 | 250 | 420 | 120 | 300 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 17~18 | Nodular Cast Iron | 120 | 350 | 120 | 300 | 120 | 280 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| N | 21~30 | Non-Ferrous Metals (Al) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 250 | 1200 | 250 | 800 |
| S | 31~37 | Superalloys & Titanium | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 30 | 100 | 30 | 70 | 30 | 50 | 30 | 90 | - | - | - | - |
| H | 38~41 | Hard Materials | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Insert ISO Code System

*Metric : According to ISO 1832

page 14 page 12

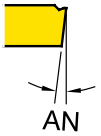
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| C | N | M | G | 12 | 04 | 08 | -UG | YG3020 |
| Shape | Clearance | Tolerance | Clamping & Chipbreaker | Insert Size | Insert Thickness | Corner Radius | Chipbreaker Geometry | Grade |

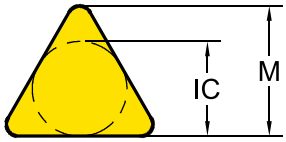
## 1 - Shape

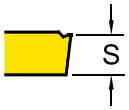
| Symbol | Shape | |
|---|---|---|
| H | Hexagonal | |
| O | Octagonal | |
| P | Pentagonal | |
| S | Square | |
| T | Triangular | |
| C | Rhombic 80° | |
| D | Rhombic 55° | |
| V | Rhombic 35° | |
| W | Trigon | |
| L | Rectangular | |
| K | Parallelogram 55° | |
| R | Round | |

## 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 | |
| A | Cylindrical Clamping hole | X | |
| M | | One Face | |
| G | | Both Faces | |
| W | Screw Hole | X | |
| T | | One Face | |
| U | | Both Faces | |
| X | Special | | |

# Insert ISO Code System

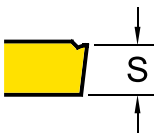
*Inch

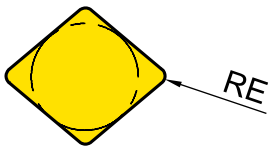
page 14 page 12

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| C | N | M | G | 4 | 3 | 2 | -UG | YG3020 |
| Shape | Clearance | Tolerance | Clamping & Chipbreaker | Insert Size | Insert Thickness | Corner Radius | Chipbreaker Geometry | Grade |

## 5 - Insert Size

| Metric | | | | | | | Inner Circle IC (mm) | Inch |
|---|---|---|---|---|---|---|---|---|
| S | T | C | D | V | W | R | | |
| **06** | **11** | **06** | **07** | **11** | | | 6.35 | **2** |
| **07** | | | | | | | 7.94 | **2.5** |
| **09** | **16** | **09** | **11** | **16** | **06** | **09** (00) | 9.525 | **3** |
| **12** | **22** | **12** | **15** | **22** | **08** | **12** (00) | 12.7 | **4** |
| **15** | | **16** | | | | | 15.875 | **5** |
| **19** | | **19** | | | | | 19.05 | **6** |
| **25** | | **25** | | | | | 25.4 | **8** |
| | | | | | | **06** (M0) | 6 | |
| | | | | | | **08** (M0) | 8 | |
| | | | | | | **10** (M0) | 10 | |
| | | | | | | **12** (M0) | 12 | |
| | | | | | | **16** (M0) | 16 | |




## 6 - Insert Thickness (S)

| Metric | Thickness - S (mm) | Inch |
|---|---|---|
| **T1** | 1.98 | **1.2** |
| **02** | 2.38 | **1.5** |
| **03** | 3.18 | **2** |
| **T3** | 3.97 | **2.5** |
| **04** | 4.76 | **3** |
| **05** | 5.56 | **3.5** |
| **06** | 6.35 | **4** |
| **07** | 7.94 | **5** |
| **09** | 9.525 | **6** |

## 7 - Corner Radius (RE)

| Metric | Corner Radius - RE (mm) | Inch |
|---|---|---|
| **01** | 0.1 | **0** |
| **02** | 0.2 | **0.5** |
| **04** | 0.4 | **1** |
| **08** | 0.8 | **2** |
| **12** | 1.2 | **3** |
| **16** | 1.6 | **4** |
| **20** | 2.0 | **5** |
| **24** | 2.4 | **6** |

# Grade Naming System

| 1 | 2 | 3 | 4 | 5 | (6) |
|---|---|---|---|---|---|
| **YG** | **3** | **0** | **2** | **0** | **(G)** |
| YG Brand | Workpiece Material | Grade Version | Application Range (1st Digit) | Application Range (2nd Digit) | Minor Variation |
| Carbide CVD (4 Digits) | ● | ● | ● | ● | YG3020 |
| Carbide PVD (3 Digits) | ● | ● | ● | | YG211 |
| Carbide Uncoated (2 Digits) | ● | ● | | | YG10 |

## 1 - YG Brand

## 2 - Workpiece Material

| Symbol | Workpiece Material | Turning | Milling | Drilling | Parting |
|---|---|---|---|---|---|
| 1 | K Cast Iron or N Non-Ferrous | ● | | | |
| 2 | M Stainless Steel | ● | | | |
| 3 | P Steel | ● | | | |
| 4 | S Superalloys | ● | | | |
| 5 | K Cast Iron or N Non-Ferrous | | ● | ● | ● |
| 6 | M Stainless Steel or Universal | | ● | ● | ● |
| 7 | P Steel | | ● | ● | ● |
| 8 | Universal | ● | | | |

## 4 & 5 — Application Range

| Symbol | |
|---|---|
| 05 | Stable — Wear Resistant Grade, Stable Application, Continuous Cut, Finishing |
| 10 | |
| 15 | |
| 20 | General — Balanced Grade, High Versatility, General Application |
| 25 | |
| 30 | |
| 35 | |
| 40 | Unstable — Tougher Grade, Unstable Application, Interrupted Cut, Chipping Resistance, Roughing |
| 45 | |

## 3 — Grade Version

## (6) — (Minor Variation)

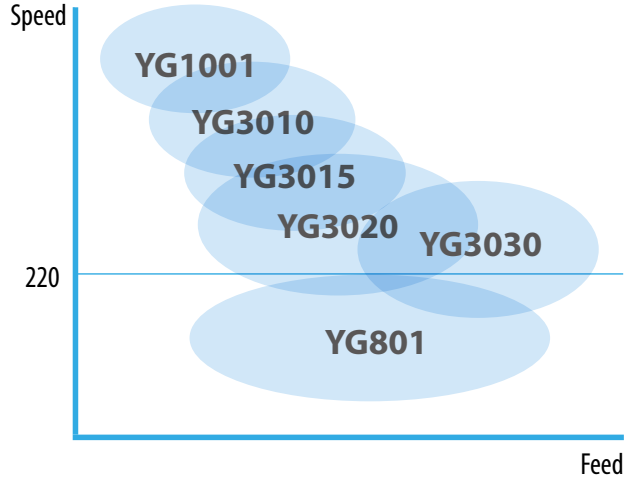
G — Gold Coated Version

Product Overview

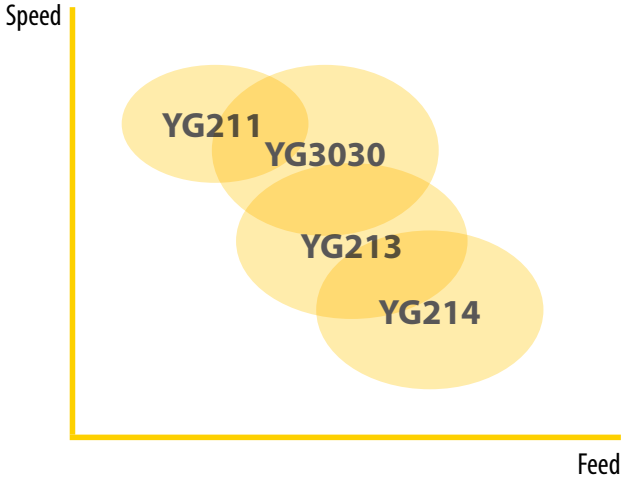
# Turning Grades Map

Speed : Vc(m/min.)
Feed : Fn (mm/rev.)

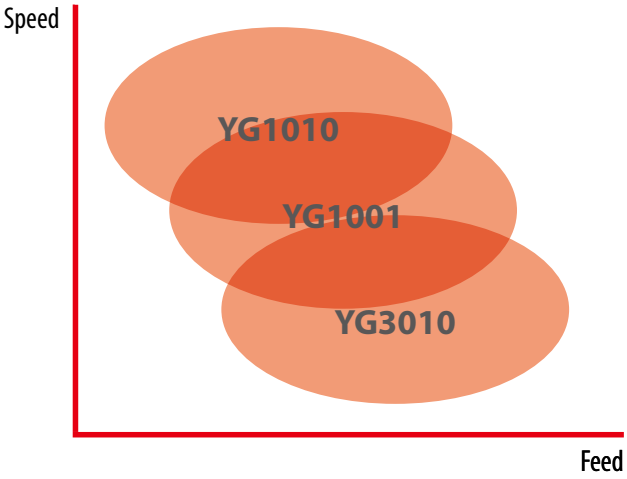
## Steels



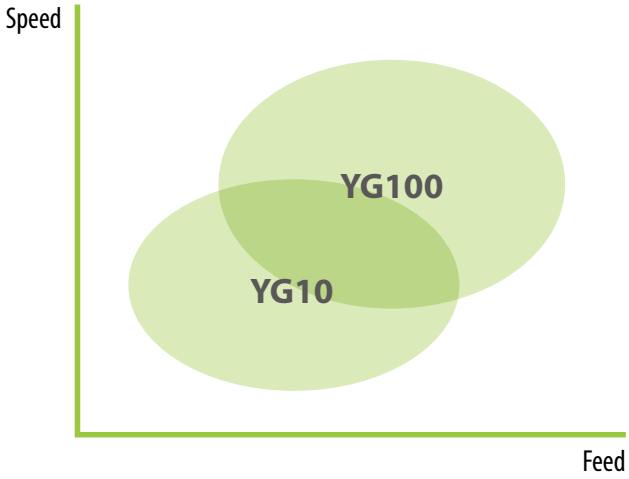

## Stainless steels



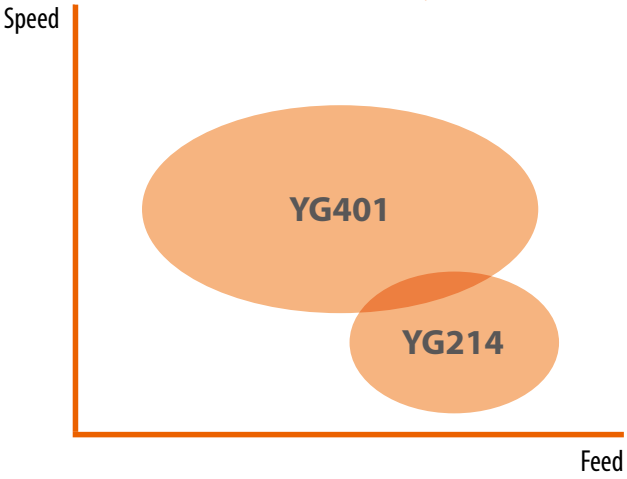

## Cast iron




## Non-ferrous Metals




## Superalloys



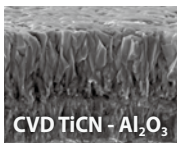
YG TURN

Product Overview

# Turning Grades

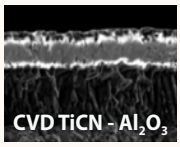
| Turning Grades | | P Steel | | | | M Stainless steel | | | K Cast iron | | | N Non-ferrous | | S Superalloys | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | P10 | P20 | P30 | P40 | M10 | M20 | M30 | K10 | K20 | K30 | N10 | N20 | S10 | S20 |
| CVD | YG1010 | | | | | | | | 1010 | | | | | | |
| | YG1001 | 1001 | | | | | | | | 1001 | | | | | |
| | YG3010 | | 3010 | | | | | | | 3010 | | | | | |
| | YG3015 | | 3015 | | | | | | | | | | | | |
| | YG3020 | | | 3020 | | | | | | | | | | | |
| | YG3030 | | | 3030 | | | 3030 | | | | | | | | |
| PVD | YG801 | | 801 | | | | | | | | | | | | |
| | YG211 | | | | | 211 | | | | | | | | | |
| | YG213 | | | | | | 213 | | | | | | | | |
| | YG214 | | | | | | | 214 | | | | | | | 214 |
| | YG401 | | | | | | | | | | | | | 401 | |
| DLC | YG100 | | | | | | | | | | | 100 | | | |
| - | YG10 | | | | | | | | | | | 10 | | | |

**YG1010**
K05 - K15



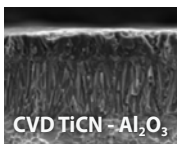

**First Choice for Cast Iron**
- Effective coating structure enables high speed machining
- Special post treatment for improved chipping resistance

**YG1001**
P01 - P10
K10 - K25



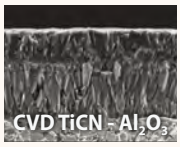

**First Choice for Stable Machining of Cast Iron**
- Substrate especially designed for high wear resistance
- Thick $Al_2O_3$ layer ensures good wear resistance at high cutting speeds including dry machining

**YG3010**
P05 - P20
K15 - K35




**First choice for Finishing Steels, and Ductile Cast iron**
- Finishing and light machining of steel under in stable condition
- New $Al_2O_3$ coating technology and excellent surface smoothness increase wear resistance and chipping resistance

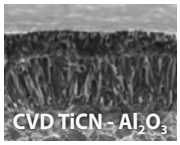
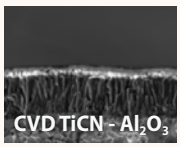
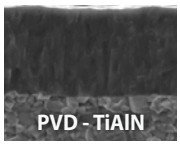
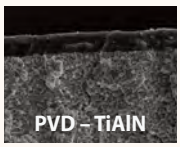
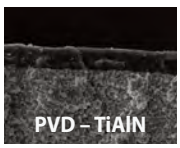
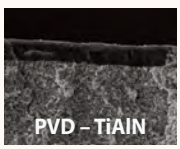
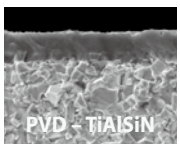
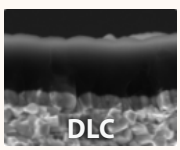
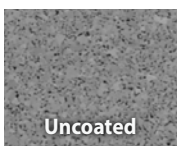
**YG3015**
P10 - P25




**Balanced Productivity for Continuous cut**
- High wear resistance and improved toughness ensures high productivity with less trouble

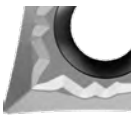
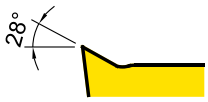
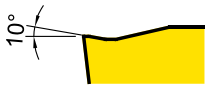
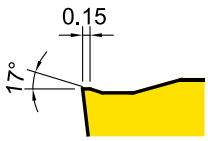
Product Overview

# Turning Grades

| | | |
|---|---|---|
| **YG3020**<br>P15 - P30 |  | **First Choice Grade for General Steel Application**<br>• Substrate especially designed for good toughness<br>• Excellent surface smoothness increases wear resistance and reliability |
| **YG3030**<br>P20 - P35<br>M10 - M30 |  | **Interrupted Cutting of Steel and Stainless steel**<br>• Substrate for heavy roughing in mild steel and low carbon alloy steel<br>• New $Al_2O_3$ technology and optimized surface treatment achieves a good balance between wear resistance and chipping resistance |
| **YG801**<br>P10 - P30 |  | **for Carbon Steel with Low Cutting Speed**<br>• Recommended for mild steel and boring application<br>• Substrate and special PVD coating for excellent wear resistance |
| **YG211**<br>M05 - M25 |  | **High wear Resistance Grade for Stainless steel**<br>• Finishing Stainless steel |
| **YG213**<br>M20 - M35 |  | **First Choice Grade on Low Cutting Speed of Stainless steel**<br>• First choice on Stainless steel for Low cutting speed<br>• For Medium to low cutting speed |
| **YG214**<br>M30 - M40<br>S25 - S30 |  | **Heavy Interrupted cut for Stainless steel**<br>• For Heavy Interrupted cut on Stainless steel<br>• Minimize risk of Mechanical fracture or Chipping |
| **YG401**<br>S10 - S20 |  | **PVD Turning Grade for HRSA**<br>• Highly heat-resistant TiAlSiN structure for excellent wear resistance<br>• Greatly improved film coating realizes excellent boundary defect resistance<br>• Top coating layer provides a smooth surface and lubricant effect |
| **YG100**<br>N05 - N25 |  | **First Choice Grade for Aluminum with DLC Coating**<br>• Submicron carbide for high wear resistance<br>• DLC coating minimizes Built Up Edge tendency.<br>• Improve tool life in sticky non-ferrous alloy |
| **YG10**<br>N05 - N25 |  | **Uncoated Grade for General Aluminum**<br>• Substrate consisted of submicron carbide for high wear resistance<br>• Shining surface to prevent built up edge |

# Turning Chipbreakers - Positive



| P | M | K | N | S | | | |
|---|---|---|---|---|---|---|---|
| | | | N | | AL |  | Aluminum application   |
| P | M | | | | UF |  | Finishing application   |
| P | | K | | | UG |  | Medium application   |