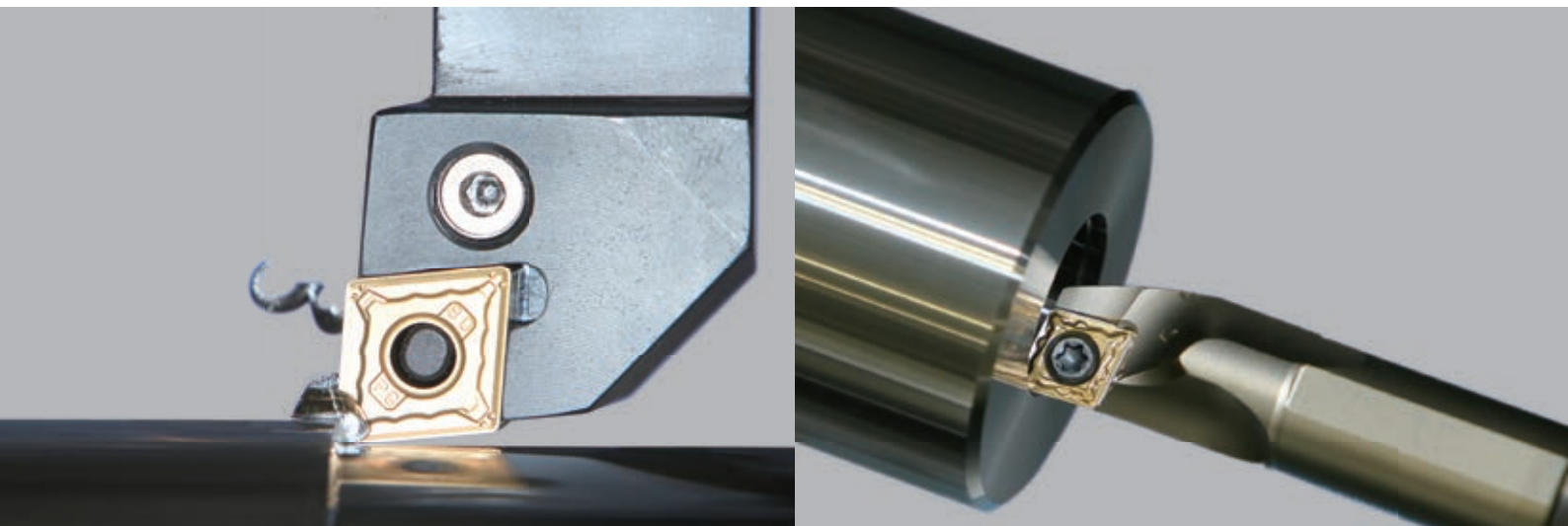


New CVD coated carbide  
grade for steel

# CA5 Series



Long tool life and stable machining of steel

New CA5 series for longer tool life and stable machining

Various chipbreakers available for steel machining



**NEW**

WF chipbreaker  
(finishing)



WE chipbreaker  
(finishing - medium)



New CVD coated carbide grade for steel

# CA5 Series

Longer tool life and stable machining

Various chipbreakers available

1

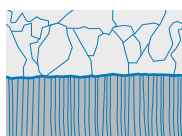
## New coated carbide grade for longer tool life and stable machining

### Longer tool life

- High-performance  $\alpha$ -Al<sub>2</sub>O<sub>3</sub> layer
- Excellent wear and fracture resistance

### Prevents layer peeling

- Strong Intra-coating adhesion
- Higher adhesion between each layer with improved crystal structure



CRIOS technology



Conventional

### Suppresses chipping

- Micro TiCN layer
- Higher layer strength and fracture resistance



CRIOS technology is Kyocera's original CVD coating technology

### 1st recommendation

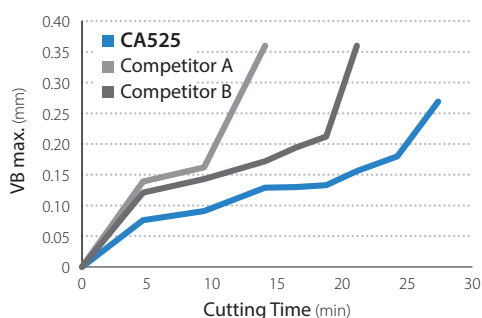
General use

## CA525

Special substrate and tough coating layer provides high wear and fracture resistance

### Wear resistance comparison

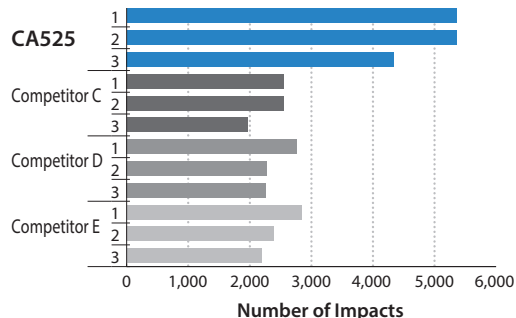
(In-house evaluation)



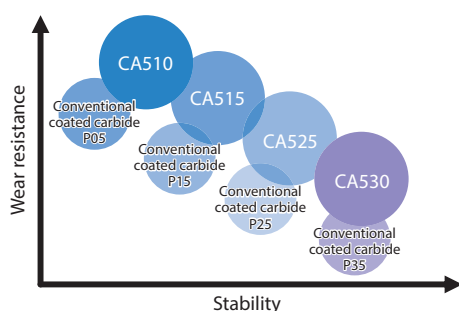
Cutting conditions: Vc = 300 m/min, ap = 2.0 mm, f = 0.3 mm/rev, wet  
Workpiece: 34CrMo4

### Fracture resistance comparison

(In-house evaluation)



Cutting conditions: Vc = 300 m/min, ap = 1.5 mm, f = 0.3 mm/rev, wet  
Workpiece: 42CrMo4 (with 4 slots)



## CA510

High speed and high efficiency steel machining  
Wear resistance oriented

## CA515

Continuous to light interrupted steel machining

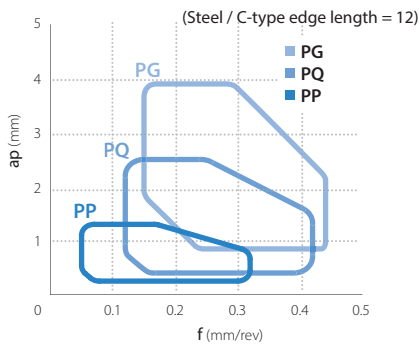
## CA530

General to heavy interrupted machining  
Stability oriented

## 2

## Various chipbreakers available for steel machining

### Negative type



### PG chipbreaker (medium - roughing)

Provides stable machining with wide chip control range

#### Step wall

Prevents chip compacting at high feed rate

#### Hybrid land

Good balance of sharpness and strength due to double structure of flat and positive land design

#### Twin dots

Improve chip control at low feed rate  
Control crater wear

### PP chipbreaker (finishing)

For a wide range of feed rates in steel finishing

#### Smooth taper cutting edge

Reduces cutting force

#### 3-step smart dot structure

3 different dots provide smooth chip evacuation in a wide range of feed rate

### PQ chipbreaker (finishing - medium)

Stable chip control in a wide range of applications

#### 2-step smart wall

(2-step rising smooth surface)  
Excellent chip control in a wide range of applications, preventing the dots from being damaged at high feed cuttings

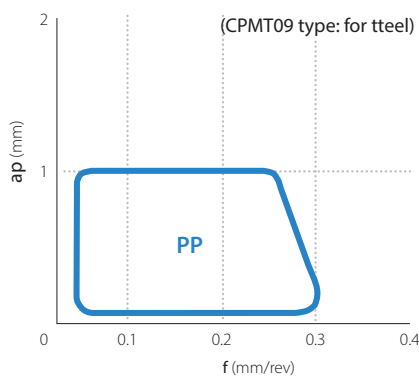
#### Twin dots

Flat zone (breaking area)

#### Continuously variable land

Specially designed positive land has well-balanced combination of sharpness and toughness

### Positive type



### PP chipbreaker (finishing)

Stable chip control when finishing steel

#### High-stability cutting edge design

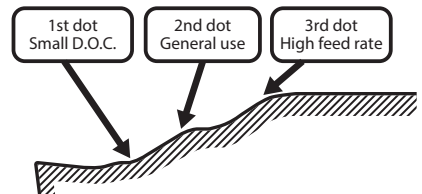
Suitable shape for controlling the edge stress and heat generation

Stable performance with superior edge strength

### Composite-dot chipbreaker

Multi-dot design with different functions  
Controls chip's curling condition and flow direction that varies depending on the cutting conditions and work materials

Stable chip control regardless of feed rate and work materials



## 3

## New negative wiper inserts

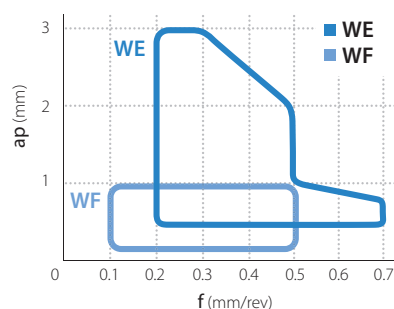
High productivity with newly designed wiper edge geometry

### WE chipbreaker (finishing - medium)

Stable chip control in a wide range of feed rates

### WF chipbreaker (finishing)

Good surface finish due to stable chip control in steel finishing



## Negative type inserts

| Shape                                                                               | Description   | Dimensions (mm) |           |      |                            | CA510 | CA515 | CA525 | CA530 |
|-------------------------------------------------------------------------------------|---------------|-----------------|-----------|------|----------------------------|-------|-------|-------|-------|
|                                                                                     |               | I.C.            | Thickness | Hole | Corner-R (r <sub>e</sub> ) |       |       |       |       |
|    | CNMG 120404WF | 12.70           | 4.76      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120408WF      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|    | CNMG 120404WP | 12.70           | 4.76      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120408WP      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|    | CNMG 120404WE | 12.70           | 4.76      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120408WE      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120412WE      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|    | CNMG 120404WQ | 12.70           | 4.76      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120408WQ      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120412WQ      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|    | CNMG 120402PP | 12.70           | 4.76      | 5.16 | 0.2                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120404PP      |                 |           |      | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120408PP      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120412PP      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|   | CNMG 120402GP | 12.70           | 4.76      | 5.16 | 0.2                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120404GP      |                 |           |      | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120408GP      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|  | CNMG 120404PQ | 12.70           | 4.76      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120408PQ      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120412PQ      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|  | CNMG 090404HQ | 9.525           | 4.76      | 3.81 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                     | 090408HQ      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|  | CNMG 120404HQ | 12.70           | 4.76      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120408HQ      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120412HQ      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|  | CNMG 120404CQ | 12.70           | 4.76      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120408CQ      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120412CQ      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|  | CNMG 160608CQ | 15.875          | 6.35      | 6.35 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                     | 160612CQ      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|  | CNMG 120408CJ | 12.70           | 4.76      | 5.16 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120412CJ      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                     | CNMG 160612CJ | 15.875          | 6.35      | 6.35 | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                     | 160616CJ      |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |
|  | CNMG 090404GS | 9.525           | 4.76      | 3.81 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                     | 090408GS      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|  | CNMG 120404GS | 12.70           | 4.76      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120408GS      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120412GS      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |

● : Available

| Shape                                                                               | Description   | Dimensions (mm) |           |      |                            | CA510 | CA515 | CA525 | CA530 |
|-------------------------------------------------------------------------------------|---------------|-----------------|-----------|------|----------------------------|-------|-------|-------|-------|
|                                                                                     |               | I.C.            | Thickness | Hole | Corner-R (r <sub>e</sub> ) |       |       |       |       |
|    | CNMG 120404PG | 12.70           | 4.76      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120408PG      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120412PG      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120416PG      |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |
|    | CNMG 120404PS | 12.70           | 4.76      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120408PS      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120412PS      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120416PS      |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |
|    | CNMG 160612PS | 15.875          | 6.35      | 6.35 | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                     | 160616PS      |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |
|    | CNMG 120408PT | 12.70           | 4.76      | 5.16 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120412PT      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|    | CNMG 160608PT | 15.875          | 6.35      | 6.35 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                     | 160612PT      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                     | 160616PT      |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |
|   | CNMG 120408GT | 12.70           | 4.76      | 5.16 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120412GT      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|  | CNMG 120404   | 12.70           | 4.76      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120408        |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120412        |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|  | CNMG 160608   | 15.875          | 6.35      | 6.35 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                     | 160612        |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|  | CNMG 190612   | 19.05           | 6.35      | 7.94 | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                     | 190616        |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |
|  | CNMG 120408PH | 12.70           | 4.76      | 5.16 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120412PH      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120416PH      |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |
|  | CNMG 160608PH | 15.875          | 6.35      | 6.35 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                     | 160612PH      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                     | 160616PH      |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |
|  | CNMG 190608PH | 19.05           | 6.35      | 7.94 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                     | 190612PH      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                     | 190616PH      |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |
|                                                                                     | 190624PH      |                 |           |      | 2.4                        | ●     | ●     | ●     | ●     |
|  | CNMM 120408PX | 12.70           | 4.76      | 5.16 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120412PX      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                     | 120416PX      |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |
|  | CNMM 160608PX | 15.875          | 6.35      | 6.35 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                     | 160612PX      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                     | 160616PX      |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |
|  | CNMM 190608PX | 19.05           | 6.35      | 7.94 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                     | 190612PX      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                     | 190616PX      |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |
|                                                                                     | 190624PX      |                 |           |      | 2.4                        | ●     | ●     | ●     | ●     |

● : Available

## Negative type inserts

| Shape                                                                                                                | Description   | Dimensions (mm) |           |      |                            | CA510 | CA515 | CA525 | CA530 |
|----------------------------------------------------------------------------------------------------------------------|---------------|-----------------|-----------|------|----------------------------|-------|-------|-------|-------|
|                                                                                                                      |               | I.C.            | Thickness | Hole | Corner-R (r <sub>e</sub> ) |       |       |       |       |
| <br>Low carbon steel /<br>Finishing | CNMG 120404XP | 12.70           | 4.76      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                      | 120408XP      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
| <br>Low carbon steel /<br>Medium    | CNMG 120404XQ | 12.70           | 4.76      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                      | 120408XQ      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
| <br>Low carbon steel /<br>Roughing  | CNMG 120408XS | 12.70           | 4.76      | 5.16 | 0.8                        | ●     | ●     | ●     | ●     |
| <br>Finishing with wiper edge       | DNMX 150404WF | 12.70           | 4.76      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                      | 150408WF      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                      | 150412WF      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                      | DNMX 150604WF | 12.70           | 6.35      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                      | 150608WF      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                      | 150612WF      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
| <br>Finishing                     | DNMG 150402PP | 12.70           | 4.76      | 5.16 | 0.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                      | 150404PP      |                 |           |      | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                      | 150408PP      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                      | 150412PP      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                      | DNMG 150602PP | 12.70           | 6.35      | 5.16 | 0.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                      | 150604PP      |                 |           |      | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                      | 150608PP      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
| <br>Finishing                     | DNMG 110404GP | 9.525           | 4.76      | 3.81 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                      | 110408GP      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                      | DNMG 150402GP | 12.70           | 4.76      | 5.16 | 0.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                      | 150404GP      |                 |           |      | 0.4                        | ●     | ●     | ●     | ●     |
| <br>Finishing-Medium              | DNMG 150404PQ | 12.70           | 4.76      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                      | 150408PQ      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                      | 150412PQ      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                      | DNMG 150604PQ | 12.70           | 6.35      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                      | 150608PQ      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                      | 150612PQ      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
| <br>Finishing-Medium              | DNMG 110402HQ | 9.525           | 4.76      | 3.81 | 0.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                      | 110404HQ      |                 |           |      | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                      | DNMG 150404HQ | 12.70           | 4.76      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                      | 150408HQ      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                      | 150412HQ      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                      | DNMG 150604HQ | 12.70           | 6.35      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                      | 150608HQ      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                      | 150612HQ      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |

● : Available

| Shape                                                                                                                 | Description   | Dimensions (mm) |           |      |                            | CA510 | CA515 | CA525 | CA530 |
|-----------------------------------------------------------------------------------------------------------------------|---------------|-----------------|-----------|------|----------------------------|-------|-------|-------|-------|
|                                                                                                                       |               | I.C.            | Thickness | Hole | Corner-R (r <sub>e</sub> ) |       |       |       |       |
| <br>Finishing-Medium /<br>Up facing  | DNMG 150404CQ | 12.70           | 4.76      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | 150408CQ      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | 150412CQ      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | DNMG 150604CQ | 12.70           | 6.35      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | 150608CQ      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
| <br>Finishing-Medium /<br>Up facing  | DNMG 150408CJ | 12.70           | 4.76      | 5.16 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | 150412CJ      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | DNMG 150608CJ | 12.70           | 6.35      | 5.16 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | 150612CJ      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
| <br>Medium-Roughing                  | DNMG 110404GS | 9.525           | 4.76      | 3.81 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | 110408GS      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | DNMG 150404GS | 12.70           | 4.76      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | 150408GS      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | 150412GS      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | DNMG 150604GS | 12.70           | 6.35      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | 150608GS      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
| <br>Medium-Roughing                | DNMG 150404PG | 12.70           | 4.76      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | 150408PG      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | 150412PG      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | 150416PG      |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | DNMG 150604PG | 12.70           | 6.35      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | 150608PG      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | 150612PG      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | 150616PG      |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | DNMG 150404PS | 12.70           | 4.76      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | 150408PS      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | 150412PS      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
| <br>Medium-Roughing                | DNMG 150604PS | 12.70           | 6.35      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | 150608PS      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | 150612PS      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | 150616PS      |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | DNMG 150408PT | 12.70           | 4.76      | 5.16 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | 150412PT      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
| <br>Medium-Roughing /<br>High feed | DNMG 150608PT | 12.70           | 6.35      | 5.16 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | 150612PT      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | DNMG 150408GT | 12.70           | 4.76      | 5.16 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | 150412GT      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
| <br>Medium-Roughing /<br>High feed | DNMG 150608GT | 12.70           | 6.35      | 5.16 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                       | 150612GT      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |

● : Available

## Negative type inserts

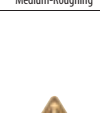
| Shape                                                                                                                    | Description   | Dimensions (mm) |           |      |                            | CA510 | CA515 | CA525 | CA530 |
|--------------------------------------------------------------------------------------------------------------------------|---------------|-----------------|-----------|------|----------------------------|-------|-------|-------|-------|
|                                                                                                                          |               | I.C.            | Thickness | Hole | Corner-R (r <sub>e</sub> ) |       |       |       |       |
| <br>Roughing                            | DNMG 150404   | 12.70           | 4.76      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 150408        |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | DNMG 150608   | 12.70           | 6.35      | 5.16 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 150612        |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
| <br>Roughing                            | DNMG 150408PH | 12.70           | 4.76      | 5.16 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 150412PH      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 150416PH      |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | DNMG 150608PH | 12.70           | 6.35      | 5.16 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 150612PH      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 150616PH      |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |
| <br>Single Sided / Roughing / High feed | DNMM 150408PX | 12.70           | 4.76      | 5.16 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 150412PX      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 150416PX      |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | DNMM 150608PX | 12.70           | 6.35      | 5.16 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 150612PX      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 150616PX      |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |
| <br>Low carbon steel / Finishing       | DNMG 150404XP | 12.70           | 4.76      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 150408XP      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
| <br>Low carbon steel / Medium         | DNMG 150404XQ | 12.70           | 4.76      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 150408XQ      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
| <br>Low carbon steel / Roughing       | DNMG 150408XS | 12.70           | 4.76      | 5.16 | 0.8                        | ●     | ●     | ●     | ●     |
| <br>Medium-Roughing                   | RNMG 090300   | 9.525           | 3.18      | 3.81 | —                          | ●     | ●     | ●     | ●     |
|                                                                                                                          | RNMG 120400   | 12.70           | 4.76      | 5.16 | —                          | ●     | ●     | ●     | ●     |
|                                                                                                                          | RNMG 150600   | 15.875          | 6.35      | 6.35 | —                          | ●     | ●     | ●     | ●     |
| <br>Finishing-Medium                  | SNMG 120404PQ | 12.70           | 4.76      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 120408PQ      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 120412PQ      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
| <br>Finishing-Medium                  | SNMG 120404HQ | 12.70           | 4.76      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 120408HQ      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 120412HQ      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
| <br>Medium-Roughing                   | SNMG 120408PG | 12.70           | 4.76      | 5.16 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 120412PG      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 120416PG      |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |

● : Available

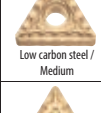
| Shape                                                                                                                      | Description   | Dimensions (mm) |           |      |                            | CA510 | CA515 | CA525 | CA530 |
|----------------------------------------------------------------------------------------------------------------------------|---------------|-----------------|-----------|------|----------------------------|-------|-------|-------|-------|
|                                                                                                                            |               | I.C.            | Thickness | Hole | Corner-R (r <sub>e</sub> ) |       |       |       |       |
| <br>Medium-Roughing                       | SNMG 120408PS | 12.70           | 4.76      | 5.16 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                            | 120412PS      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                            | 120416PS      |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |
| <br>Medium-Roughing High feed             | SNMG 120408PT | 12.70           | 4.76      | 5.16 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                            | 120412PT      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
| <br>Roughing                              | SNMG 090304   | 9.525           | 3.18      | 3.81 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                            | 090308        |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                            | SNMG 120408   | 12.70           | 4.76      | 5.16 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                            | 120412        |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                            | 120416        |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |
|                                                                                                                            | SNMG 120408PH |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
| <br>Roughing                              | SNMG 120412PH | 12.70           | 4.76      | 5.16 | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                            | 120416PH      |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |
|                                                                                                                            | SNMG 150612PH | 15.875          | 6.35      | 6.35 | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                            | 150616PH      |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |
|                                                                                                                            | SNMG 190612PH | 19.05           | 6.35      | 7.94 | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                            | 190616PH      |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |
| <br>Single Sided / Roughing / High feed | SNMM 120408PX | 12.70           | 4.76      | 5.16 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                            | 120412PX      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                            | 120416PX      |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |
|                                                                                                                            | SNMM 150612PX | 15.875          | 6.35      | 6.35 | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                            | 150616PX      |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |
|                                                                                                                            | SNMM 190612PX | 19.05           | 6.35      | 7.94 | 1.2                        | ●     | ●     | ●     | ●     |
| <br>Low carbon steel / Finishing        | SNMG 120408XP | 12.70           | 4.76      | 5.16 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                            | 120408XQ      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                            | SNMG 120408XS | 12.70           | 4.76      | 5.16 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                            | 120408XQ      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                            | SNMG 120408XS | 12.70           | 4.76      | 5.16 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                            | 120408XQ      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
| <br>Finishing with wiper edge           | TNMX 160404WF | 9.525           | 4.76      | 3.81 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                            | 160408WF      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                            | 160412WF      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
| <br>Finishing                           | TNMG 160402PP | 9.525           | 4.76      | 3.81 | 0.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                            | 160404PP      |                 |           |      | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                            | 160408PP      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                            | 160412PP      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |

● : Available

## Negative type inserts

| Shape                                                                                                              | Description   | Dimensions (mm) |           |      |                            | CA510 | CA515 | CA525 | CA530 |
|--------------------------------------------------------------------------------------------------------------------|---------------|-----------------|-----------|------|----------------------------|-------|-------|-------|-------|
|                                                                                                                    |               | I.C.            | Thickness | Hole | Corner-R (r <sub>e</sub> ) |       |       |       |       |
| <br>Finishing                     | TNMG 160402GP | 9.525           | 4.76      | 3.81 | 0.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                    | 160404GP      |                 |           |      | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                    | 160408GP      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
| <br>Finishing-Medium              | TNMG 160404PQ | 9.525           | 4.76      | 3.81 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                    | 160408PQ      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                    | 160412PQ      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
| <br>Finishing-Medium              | TNMG 110404HQ | 6.35            | 4.76      | 2.26 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                    | 110408HQ      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                    | TNMG 160404HQ | 9.525           | 4.76      | 3.81 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                    | 160408HQ      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
| <br>Finishing-Medium              | 160412HQ      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                    |               |                 |           |      |                            |       |       |       |       |
|                                                                                                                    | TNMG 160404CQ | 9.525           | 4.76      | 3.81 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                    | 160408CQ      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
| <br>Finishing-Medium / Up facing  | 160412CQ      | 12.70           | 4.76      | 5.16 | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                    |               |                 |           |      |                            |       |       |       |       |
|                                                                                                                    | TNMG 220408CQ |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                    | 220412CQ      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
| <br>Medium-Roughing              | TNMG 110404GS | 6.35            | 4.76      | 2.26 | 0.4                        |       |       | ●     | ●     |
|                                                                                                                    | 110408GS      |                 |           |      | 0.8                        |       |       | ●     | ●     |
|                                                                                                                    | TNMG 160404GS | 9.525           | 4.76      | 3.81 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                    | 160408GS      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
| <br>Medium-Roughing             | TNMG 160404PG | 9.525           | 4.76      | 3.81 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                    | 160408PG      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                    | 160412PG      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
| <br>Medium-Roughing             | TNMG 160404PS | 9.525           | 4.76      | 3.81 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                    | 160408PS      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                    | 160412PS      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                    | TNMG 220404PS | 12.70           | 4.76      | 5.16 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                    | 220408PS      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                    | 220412PS      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
| <br>Medium-Roughing             | 220416PS      |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |
|                                                                                                                    |               |                 |           |      |                            |       |       |       |       |
|                                                                                                                    |               |                 |           |      |                            |       |       |       |       |
| <br>Medium-Roughing / High feed | TNMG 160408PT | 9.525           | 4.76      | 3.81 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                    | 160412PT      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
| <br>Medium-Roughing / High feed | TNMG 160408GT | 9.525           | 4.76      | 3.81 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                    | 160412GT      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
| <br>Roughing                    | TNMG 160404   | 9.525           | 4.76      | 3.81 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                    | 160408        |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                    | 160412        |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                    | TNMG 220408   | 12.70           | 4.76      | 5.16 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                    | 220412        |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |

● : Available

| Shape<br>Handed Insert<br>shows Right-hand                                                                               | Description        | Dimensions (mm) |           |      |                            | CA510 | CA515 | CA525 | CA530 |
|--------------------------------------------------------------------------------------------------------------------------|--------------------|-----------------|-----------|------|----------------------------|-------|-------|-------|-------|
|                                                                                                                          |                    | I.C.            | Thickness | Hole | Corner-R (r <sub>e</sub> ) |       |       |       |       |
| <br>Roughing                            | TNMG 160408PH      | 9.525           | 4.76      | 3.81 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 160412PH           |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | TNMG 220408PH      | 12.70           | 4.76      | 5.16 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 220412PH           |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
| <br>Single Sided / Roughing / High feed | 220416PH           |                 |           |      | 1.6                        | ●     | ●     | ●     | ●     |
|                                                                                                                          |                    |                 |           |      |                            |       |       |       |       |
|                                                                                                                          | TNMM 160408PX      | 9.525           | 4.76      | 3.81 | 0.8                        |       |       | ●     | ●     |
|                                                                                                                          | 160412PX           |                 |           |      | 1.2                        |       |       | ●     | ●     |
| <br>Single Sided / Roughing / High feed | TNMM 220408PX      | 12.70           | 4.76      | 5.16 | 0.8                        |       |       | ●     | ●     |
|                                                                                                                          | 220412PX           |                 |           |      | 1.2                        |       |       | ●     | ●     |
|                                                                                                                          | 220416PX           |                 |           |      | 1.6                        |       |       | ●     | ●     |
|                                                                                                                          |                    |                 |           |      |                            |       |       |       |       |
| <br>Low carbon steel / Finishing        | TNMG 160404XP      | 9.525           | 4.76      | 3.81 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 160408XP           |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
| <br>Low carbon steel / Medium          | TNMG 160404XQ      | 9.525           | 4.76      | 3.81 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 160408XQ           |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
| <br>Low carbon steel / Roughing       | TNMG 160408XS      | 9.525           | 4.76      | 3.81 | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                          |                    |                 |           |      |                            |       |       |       |       |
| <br>Medium-Roughing                   | TNMG 160404 R/L-ST | 9.525           | 4.76      | 3.81 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 160408 R/L-ST      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
| <br>Finishing                         | VNMG 160402PP      | 9.525           | 4.76      | 3.81 | 0.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 160404PP           |                 |           |      | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 160408PP           |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 160412PP           |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
| <br>Finishing                         | VNMG 160402GP      | 9.525           | 4.76      | 3.81 | 0.2                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 160404GP           |                 |           |      | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 160408GP           |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
| <br>Finishing-Medium                  | VNMG 160404 R/L-VC | 9.525           | 4.76      | 3.81 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 160408 R/L-VC      |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 160412 R/L-VC      |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
| <br>Finishing-Medium                  | VNMG 160404VF      | 9.525           | 4.76      | 3.81 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 160408VF           |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 160412VF           |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
| <br>Finishing-Medium                  | VNMG 160404PQ      | 9.525           | 4.76      | 3.81 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 160408PQ           |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 160412PQ           |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
| <br>Finishing-Medium                  | VNMG 160404HQ      | 9.525           | 4.76      | 3.81 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 160408HQ           |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 160412HQ           |                 |           |      | 1.2                        | ●     | ●     | ●     | ●     |
| <br>Roughing                          | VNMG 160404        | 9.525           | 4.76      | 3.81 | 0.4                        | ●     | ●     | ●     | ●     |
|                                                                                                                          | 160408             |                 |           |      | 0.8                        | ●     | ●     | ●     | ●     |

● : Available

## Negative type inserts

| Shape                                                                               | Description   | Dimensions (mm) |           |      |               | CA510 | CA515 | CA525 | CA530 |
|-------------------------------------------------------------------------------------|---------------|-----------------|-----------|------|---------------|-------|-------|-------|-------|
|                                                                                     |               | I.C.            | Thickness | Hole | Corner-R (rø) |       |       |       |       |
|    | WNMG 080404WF | 12.70           | 4.76      | 5.16 | 0.4           | ●     | ●     | ●     | ●     |
|                                                                                     | 080408WF      |                 |           |      | 0.8           | ●     | ●     | ●     | ●     |
|    | WNMG 080404WP | 12.70           | 4.76      | 5.16 | 0.4           | ●     | ●     | ●     | ●     |
|                                                                                     | 080408WP      |                 |           |      | 0.8           | ●     | ●     | ●     | ●     |
|    | WNMG 080404WE | 12.70           | 4.76      | 5.16 | 0.4           | ●     | ●     | ●     | ●     |
|                                                                                     | 080408WE      |                 |           |      | 0.8           | ●     | ●     | ●     | ●     |
|    | WNMG 080412WE |                 |           |      | 1.2           | ●     | ●     | ●     | ●     |
|                                                                                     |               |                 |           |      |               |       |       |       |       |
|    | WNMG 080404WQ | 12.70           | 4.76      | 5.16 | 0.4           | ●     | ●     | ●     | ●     |
|                                                                                     | 080408WQ      |                 |           |      | 0.8           | ●     | ●     | ●     | ●     |
|   | WNMG 080412WQ |                 |           |      | 1.2           | ●     | ●     | ●     | ●     |
|                                                                                     |               |                 |           |      |               |       |       |       |       |
|  | WNMG 080402PP | 12.70           | 4.76      | 5.16 | 0.2           | ●     | ●     | ●     | ●     |
|                                                                                     | 080404PP      |                 |           |      | 0.4           | ●     | ●     | ●     | ●     |
|  | WNMG 080408PP |                 |           |      | 0.8           | ●     | ●     | ●     | ●     |
|                                                                                     | 080412PP      |                 |           |      | 1.2           | ●     | ●     | ●     | ●     |
|  | WNMG 080404PQ | 12.70           | 4.76      | 5.16 | 0.4           | ●     | ●     | ●     | ●     |
|                                                                                     | 080408PQ      |                 |           |      | 0.8           | ●     | ●     | ●     | ●     |
|  | WNMG 080412PQ |                 |           |      | 1.2           | ●     | ●     | ●     | ●     |
|                                                                                     |               |                 |           |      |               |       |       |       |       |
|  | WNMG 06T304HQ | 9.525           | 3.97      | 3.81 | 0.4           |       |       | ●     | ●     |
|                                                                                     | 06T308HQ      |                 |           |      | 0.8           |       |       | ●     | ●     |
|  | WNMG 060404HQ | 9.525           | 4.76      | 3.81 | 0.4           | ●     | ●     | ●     | ●     |
|                                                                                     | 060408HQ      |                 |           |      | 0.8           | ●     | ●     | ●     | ●     |
|  | WNMG 080404HQ | 12.70           | 4.76      | 5.16 | 0.4           | ●     | ●     | ●     | ●     |
|                                                                                     | 080408HQ      |                 |           |      | 0.8           | ●     | ●     | ●     | ●     |
|  | WNMG 080412HQ |                 |           |      | 1.2           | ●     | ●     | ●     | ●     |
|                                                                                     |               |                 |           |      |               |       |       |       |       |
|  | WNMG 080404CQ | 12.70           | 4.76      | 5.16 | 0.4           | ●     | ●     | ●     | ●     |
|                                                                                     | 080408CQ      |                 |           |      | 0.8           | ●     | ●     | ●     | ●     |
|  | WNMG 080412CQ |                 |           |      | 1.2           | ●     | ●     | ●     | ●     |
|                                                                                     |               |                 |           |      |               |       |       |       |       |
|  | WNMG 080408CJ | 12.70           | 4.76      | 5.16 | 0.8           | ●     | ●     | ●     | ●     |
|                                                                                     | 080412CJ      |                 |           |      | 1.2           | ●     | ●     | ●     | ●     |
|  | WNMG 060404GS | 9.525           | 4.76      | 3.81 | 0.4           | ●     | ●     | ●     | ●     |
|                                                                                     | 060408GS      |                 |           |      | 0.8           | ●     | ●     | ●     | ●     |
|  | WNMG 080404GS | 12.70           | 4.76      | 5.16 | 0.4           | ●     | ●     | ●     | ●     |
|                                                                                     | 080408GS      |                 |           |      | 0.8           | ●     | ●     | ●     | ●     |
|  | WNMG 080412GS |                 |           |      | 1.2           | ●     | ●     | ●     | ●     |
|                                                                                     |               |                 |           |      |               |       |       |       |       |
|  | WNMG 080404PG | 12.70           | 4.76      | 5.16 | 0.4           | ●     | ●     | ●     | ●     |
|                                                                                     | 080408PG      |                 |           |      | 0.8           | ●     | ●     | ●     | ●     |
|  | WNMG 080412PG |                 |           |      | 1.2           | ●     | ●     | ●     | ●     |
|                                                                                     | 080416PG      |                 |           |      | 1.6           | ●     | ●     | ●     | ●     |

● : Available

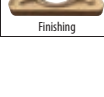
| Shape                                                                               | Description   | Dimensions (mm) |           |      |               | CA510 | CA515 | CA525 | CA530 |
|-------------------------------------------------------------------------------------|---------------|-----------------|-----------|------|---------------|-------|-------|-------|-------|
|                                                                                     |               | I.C.            | Thickness | Hole | Corner-R (rø) |       |       |       |       |
|    | WNMG 080404PS | 12.70           | 4.76      | 5.16 | 0.4           | ●     | ●     | ●     | ●     |
|                                                                                     | 080408PS      |                 |           |      | 0.8           | ●     | ●     | ●     | ●     |
|    | WNMG 080412PS |                 |           |      | 1.2           | ●     | ●     | ●     | ●     |
|                                                                                     | 080416PS      |                 |           |      | 1.6           | ●     | ●     | ●     | ●     |
|    | WNMG 080408PT | 12.70           | 4.76      | 5.16 | 0.8           | ●     | ●     | ●     | ●     |
|                                                                                     | 080412PT      |                 |           |      | 1.2           | ●     | ●     | ●     | ●     |
|    | WNMG 080408GT | 12.70           | 4.76      | 5.16 | 0.8           | ●     | ●     | ●     | ●     |
|                                                                                     | 080412GT      |                 |           |      | 1.2           | ●     | ●     | ●     | ●     |
|    | WNMG 080404   | 12.70           | 4.76      | 5.16 | 0.4           | ●     | ●     | ●     | ●     |
|                                                                                     | 080408        |                 |           |      | 0.8           | ●     | ●     | ●     | ●     |
|   | WNMG 080412   |                 |           |      | 1.2           | ●     | ●     | ●     | ●     |
|                                                                                     |               |                 |           |      |               |       |       |       |       |
|  | WNMG 080408PH | 12.70           | 4.76      | 5.16 | 0.8           | ●     | ●     | ●     | ●     |
|                                                                                     | 080412PH      |                 |           |      | 1.2           | ●     | ●     | ●     | ●     |
|  | WNMG 080404XP | 12.70           | 4.76      | 5.16 | 0.4           | ●     | ●     | ●     | ●     |
|                                                                                     | 080408XP      |                 |           |      | 0.8           | ●     | ●     | ●     | ●     |
|  | WNMG 080404XQ | 12.70           | 4.76      | 5.16 | 0.4           | ●     | ●     | ●     | ●     |
|                                                                                     | 080408XQ      |                 |           |      | 0.8           | ●     | ●     | ●     | ●     |
|  | WNMG 080408XS | 12.70           | 4.76      | 5.16 | 0.8           | ●     | ●     | ●     | ●     |
|                                                                                     |               |                 |           |      |               |       |       |       |       |

● : Available

## Positive type inserts

| Shape                                                                               | Description   | Dimensions (mm) |           |      |              | Relief Angle | CA510 | CA515 | CA525 | CA530 |
|-------------------------------------------------------------------------------------|---------------|-----------------|-----------|------|--------------|--------------|-------|-------|-------|-------|
|                                                                                     |               | I.C.            | Thickness | Hole | Corner-R (r) |              |       |       |       |       |
|    | CCMT 060202WP | 6.35            | 2.38      | 2.8  | 0.2          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                     | 060204WP      |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                     | 060208WP      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|                                                                                     | CCMT 09T302WP | 9.525           | 3.97      | 4.4  | 0.2          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                     | 09T304WP      |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                     | 09T308WP      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|    | CCMT 060202PP | 6.35            | 2.38      | 2.8  | 0.2          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                     | 060204PP      |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                     | CCMT 09T302PP | 9.525           | 3.97      | 4.4  | 0.2          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                     | 09T304PP      |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                     | 09T308PP      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|    | CCMT 060202GK | 6.35            | 2.38      | 2.8  | 0.2          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                     | 060204GK      |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                     | CCMT 09T302GK | 9.525           | 3.97      | 4.4  | 0.2          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                     | 09T304GK      |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                     | CCMT 120404GK | 12.70           | 4.76      | 5.5  | 0.4          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                     | 120408GK      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|  | CCMT 060202HQ | 6.35            | 2.38      | 2.8  | 0.2          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                     | 060204HQ      |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                     | CCMT 09T302HQ | 9.525           | 3.97      | 4.4  | 0.2          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                     | 09T304HQ      |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                     | 09T308HQ      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|  | CCMT 09T308   | 9.525           | 3.97      | 4.4  | 0.8          | 7°           | ●     | ●     | ●     | ●     |
|  | CPMT 080202PP | 7.94            | 2.38      | 3.3  | 0.2          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                     | 080204PP      |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                     | CPMT 090302PP | 9.525           | 3.18      | 4.4  | 0.2          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                     | 090304PP      |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                     | 090308PP      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|  | CPMT 080204GP | 7.94            | 2.38      | 3.3  | 0.4          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                     | 090304GP      |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                     | 090308GP      | 9.525           | 3.18      | 4.4  | 0.8          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                     | CPMH 080204HQ |                 |           |      | 0.4          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                     | 080208HQ      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|  | CPMH 090304HQ | 9.525           | 3.18      | 4.5  | 0.4          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                     | 090308HQ      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|  | CPMH 080204   | 7.94            | 2.38      | 3.5  | 0.4          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                     | 080208        |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|                                                                                     | CPMH 090304   | 9.525           | 3.18      | 4.5  | 0.4          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                     | 090308        |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|  | CPMT 080204XP | 7.94            | 2.38      | 3.3  | 0.4          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                     | 090304XP      |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                     | 090308XP      | 9.525           | 3.18      | 4.4  | 0.8          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                     | CPMT 090304XQ |                 |           |      | 0.4          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                     | 090308XQ      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |

● : Available

| Shape                                                                               | Description   | Dimensions (mm) |           |      |              | Relief Angle | CA510 | CA515 | CA525 | CA530 |
|-------------------------------------------------------------------------------------|---------------|-----------------|-----------|------|--------------|--------------|-------|-------|-------|-------|
|                                                                                     |               | I.C.            | Thickness | Hole | Corner-R (r) |              |       |       |       |       |
|    | DCMX 070202WP | 6.35            | 2.38      | 2.8  | 0.2          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                     | 070204WP      |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                     | 070208WP      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|                                                                                     | DCMX 11T302WP | 9.525           | 3.97      | 4.4  | 0.2          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                     | 11T304WP      |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                     | 11T308WP      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|    | DCMT 070202PP | 6.35            | 2.38      | 2.8  | 0.2          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                     | 070204PP      |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                     | DCMT 11T302PP | 9.525           | 3.97      | 4.4  | 0.2          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                     | 11T304PP      |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                     | 11T308PP      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|    | DCMT 070202GP | 6.35            | 2.38      | 2.8  | 0.2          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                     | 070204GP      |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                     | DCMT 11T304GP | 9.525           | 3.97      | 4.4  | 0.4          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                     | 11T308GP      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|  | DCMT 070202GK | 6.35            | 2.38      | 2.8  | 0.2          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                     | 070204GK      |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                     | 070208GK      | 9.525           | 3.97      | 4.4  | 0.8          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                     | DCMT 11T302GK |                 |           |      | 0.2          |              | ●     | ●     | ●     | ●     |
|                                                                                     | 11T304GK      |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|  | 11T308GK      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|  | DCMT 070202HQ | 6.35            | 2.38      | 2.8  | 0.2          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                     | 070204HQ      |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                     | 070208HQ      | 9.525           | 3.97      | 4.4  | 0.8          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                     | DCMT 11T302HQ |                 |           |      | 0.2          |              | ●     | ●     | ●     | ●     |
|                                                                                     | 11T304HQ      |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|  | 11T308HQ      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|  | DCMT 070204XP | 6.35            | 2.38      | 2.8  | 0.4          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                     | DCMT 11T302XP |                 |           |      | 0.2          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                     | 11T304XP      | 9.525           | 3.97      | 4.4  | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                     | 11T308XP      |                 |           |      | 0.8          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                     | DCMT 11T304XQ | 9.525           | 3.97      | 4.4  | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                     | 11T308XQ      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|  | RCMX 1003M0   | 10.0            | 3.18      | 3.6  | —            | 7°           | ●     | ●     | ●     | ●     |
|                                                                                     | RCMX 1204M0   | 12.0            | 4.76      | 4.2  | —            |              | ●     | ●     | ●     | ●     |
|  | SCMT 09T304HQ | 9.525           | 3.97      | 4.4  | 0.4          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                     | 09T308HQ      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|  | SPMR 090304   | 9.525           | 3.18      | —    | 0.4          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                     | 090308        |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|                                                                                     | SPMR 120304   | 12.70           | 3.18      | —    | 0.4          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                     | 120308        |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|  | TBMT 060102DP | 3.97            | 1.59      | 2.3  | 0.2          | 5°           | ●     | ●     | ●     | ●     |
|                                                                                     | 060104DP      |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |

● : Available

## Positive type inserts

| Shape                                                                                                                      | Description   | Dimensions (mm) |           |      |              | Relief Angle | CA510 | CA515 | CA525 | CA530 |
|----------------------------------------------------------------------------------------------------------------------------|---------------|-----------------|-----------|------|--------------|--------------|-------|-------|-------|-------|
|                                                                                                                            |               | I.C.            | Thickness | Hole | Corner-R (r) |              |       |       |       |       |
| <br>Finishing with wiper edge             | TCMX 090204WP | 5.56            | 2.38      | 2.5  | 0.4          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                                                            | TCMX 110204WP | 6.35            | 2.38      | 2.8  | 0.4          | 7°           | ●     | ●     | ●     | ●     |
| <br>Finishing-Medium                      | TCMT 110204HQ | 6.35            | 2.38      | 2.8  | 0.4          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                                                            | 110208HQ      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
| <br>Finishing with wiper edge             | TPMX 090202WP | 5.56            | 2.38      | 3.0  | 0.2          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                                                            | 090204WP      |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                                                            | 090208WP      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|                                                                                                                            | TPMX 110302WP | 6.35            | 3.18      | 3.3  | 0.2          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                                                            | 110304WP      |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                                                            | 110308WP      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
| <br>Finishing                             | TPMT 090202PP | 5.56            | 2.38      | 2.8  | 0.2          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                                                            | 090204PP      |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                                                            | TPMT 110302PP | 6.35            | 3.18      | 3.3  | 0.2          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                                                            | 110304PP      |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                                                            | 110308PP      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|                                                                                                                            | TPMT 090204GP | 5.56            | 2.38      | 2.8  | 0.4          | 11°          | ●     | ●     | ●     | ●     |
| <br>Finishing                           | TPMT 110304GP | 6.35            | 3.18      | 3.3  | 0.4          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                                                            | 110308GP      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|                                                                                                                            | TPMT 160304GP | 9.525           | 3.18      | 4.4  | 0.4          | 11°          | ●     | ●     | ●     | ●     |
| <br>Finishing-Medium                    | TPMT 090202HQ | 5.56            | 2.38      | 2.8  | 0.2          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                                                            | 090204HQ      |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                                                            | TPMT 110302HQ | 6.35            | 3.18      | 3.3  | 0.2          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                                                            | 110304HQ      |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                                                            | 110308HQ      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|                                                                                                                            | TPMT 160304HQ | 9.525           | 3.18      | 4.4  | 0.4          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                                                            | 160308HQ      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
| <br>Low carbon steel / Finishing        | TPMT 090204XP | 5.56            | 2.38      | 2.8  | 0.4          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                                                            | TPMT 110304XP | 6.35            | 3.18      | 3.3  | 0.4          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                                                            | 110308XP      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|                                                                                                                            | TPMT 160304XP | 9.525           | 3.18      | 4.4  | 0.4          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                                                            | 160308XP      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|                                                                                                                            | TPMT 110304XQ | 6.35            | 3.18      | 3.3  | 0.4          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                                                            | 110308XQ      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
| <br>Low carbon steel / Finishing-Medium | TPMT 160304XQ | 9.525           | 3.18      | 4.4  | 0.4          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                                                            | 160308XQ      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|                                                                                                                            | TPMR 160304GP | 9.525           | 3.18      | —    | 0.4          | 11°          | ●     | ●     | ●     | ●     |
| <br>Finishing-Medium                    | TPMR 110304HQ | 6.35            | 3.18      | —    | 0.4          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                                                            | 110308HQ      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|                                                                                                                            | TPMR 160304HQ | 9.525           | 3.18      | —    | 0.4          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                                                            | 160308HQ      |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
| <br>Medium                              | TPMR 110304   | 6.35            | 3.18      | —    | 0.4          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                                                            | 110308        |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|                                                                                                                            | TPMR 160304   | 9.525           | 3.18      | —    | 0.4          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                                                            | 160308        |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |

● : Available

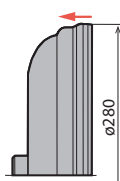
| Shape<br>Handed Insert<br>shows Left-hand                                                               | Description     | Dimensions (mm) |           |      |              | Relief Angle | CA510 | CA515 | CA525 | CA530 |
|---------------------------------------------------------------------------------------------------------|-----------------|-----------------|-----------|------|--------------|--------------|-------|-------|-------|-------|
|                                                                                                         |                 | I.C.            | Thickness | Hole | Corner-R (r) |              |       |       |       |       |
| <br>Finishing          | VBMT 110302PP   | 6.35            | 3.18      | 2.8  | 0.2          | 5°           | ●     | ●     | ●     | ●     |
|                                                                                                         | 110304PP        |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                                         | 110308PP        |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|                                                                                                         | VBMT 160404PP   | 9.525           | 4.76      | 4.4  | 0.4          | 5°           | ●     | ●     | ●     | ●     |
|                                                                                                         | 160408PP        |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|                                                                                                         | 160412PP        |                 |           |      | 1.2          |              | ●     | ●     | ●     | ●     |
| <br>Finishing          | VBMT 110304GP   | 6.35            | 3.18      | 2.8  | 0.4          | 5°           | ●     | ●     | ●     | ●     |
|                                                                                                         | VBMT 160404GP   | 9.525           | 4.76      | 4.4  | 0.4          | 5°           | ●     | ●     | ●     | ●     |
|                                                                                                         | 160408GP        |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
| <br>Finishing          | VBMT 110302VF   | 6.35            | 3.18      | 2.8  | 0.2          | 5°           | ●     | ●     | ●     | ●     |
|                                                                                                         | 110304VF        |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                                         | 110308VF        |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|                                                                                                         | VBMT 160402VF   | 9.525           | 4.76      | 4.4  | 0.2          | 5°           | ●     | ●     | ●     | ●     |
|                                                                                                         | 160404VF        |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                                         | 160408VF        |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|                                                                                                         | 160412VF        |                 |           |      | 1.2          |              | ●     | ●     | ●     | ●     |
| <br>Finishing-Medium | VBMT 110304HQ   | 6.35            | 3.18      | 2.8  | 0.4          | 5°           | ●     | ●     | ●     | ●     |
|                                                                                                         | 110308HQ        |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|                                                                                                         | VBMT 160404HQ   | 9.525           | 4.76      | 4.4  | 0.4          | 5°           | ●     | ●     | ●     | ●     |
|                                                                                                         | 160408HQ        |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|                                                                                                         | 160412HQ        |                 |           |      | 1.2          |              | ●     | ●     | ●     | ●     |
|                                                                                                         | VCMT 080202PP   | 4.76            | 2.38      | 2.3  | 0.2          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                                         | 080204PP        |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
| <br>Finishing        | VCMT 160404PP   | 9.525           | 4.76      | 4.4  | 0.4          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                                         | 160408PP        |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|                                                                                                         | VCMT 080202VF   | 4.76            | 2.38      | 2.3  | 0.2          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                                         | 080204VF        |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
| <br>Finishing-Medium | VCMT 080202HQ   | 4.76            | 2.38      | 2.3  | 0.2          | 7°           | ●     | ●     | ●     | ●     |
|                                                                                                         | 080204HQ        |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
|                                                                                                         | WBMT 060102L-DP | 3.97            | 1.59      | 2.3  | 0.2          | 5°           | L     | L     | L     | L     |
|                                                                                                         | 060104L-DP      |                 |           |      | 0.4          |              | L     | L     | L     | L     |
| <br>Finishing        | WBMT 080202L-DP | 4.76            | 2.38      | 2.3  | 0.2          | 5°           | L     | L     | L     | L     |
|                                                                                                         | 080204L-DP      |                 |           |      | 0.4          |              | L     | L     | L     | L     |
|                                                                                                         | WPMT 110204GP   | 6.35            | 2.38      | 2.8  | 0.4          | 11°          | ●     | ●     | ●     | ●     |
| <br>Finishing        | WPMT 160304GP   | 9.525           | 3.18      | 4.4  | 0.4          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                                         | WPMT 110202HQ   | 6.35            | 2.38      | 2.8  | 0.2          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                                         | 110204HQ        |                 |           |      | 0.4          |              | ●     | ●     | ●     | ●     |
| <br>Finishing        | WPMT 160304HQ   | 9.525           | 3.18      | 4.4  | 0.4          | 11°          | ●     | ●     | ●     | ●     |
|                                                                                                         | 160308HQ        |                 |           |      | 0.8          |              | ●     | ●     | ●     | ●     |
|                                                                                                         | WPMT 160304     |                 |           |      |              |              | ●     | ●     | ●     | ●     |

● : Available  
L : L-hand Only

## Case studies

### Hot rolled steel

Automotive parts  
Vc = 500 m/min  
ap = 0.7 mm  
f = 0.3 mm/rev  
Wet  
CNMG120408PG



**CA510** 100 pcs/edge

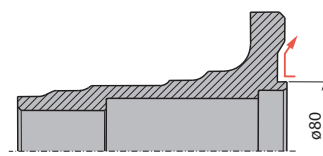
x1.3

Competitor F\* 75 pcs/edge

CA510 produces 33% longer tool life compared to competitor F's CVD. (User evaluation)

### Carbon steel

Automotive parts  
Vc = 300 m/min  
ap = 1.0 mm  
f = 0.3 mm/rev  
Wet  
DNMG150408PQ



**CA510** 200 pcs/edge

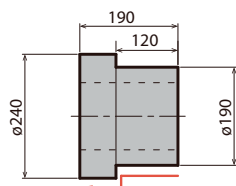
x1.3

Competitor G\* 150 pcs/edge

CA510 produces 33% longer tool life compared to competitor G's CVD. (User evaluation)

### 42CrMo4

Cover  
Vc = 140~150 m/min  
ap = 3.0~3.5 mm  
f = 0.35~0.4 mm/rev  
Wet  
CNMG120408PT



**CA515** 10 pcs/edge

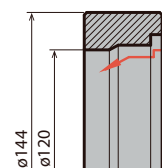
x1.4

Competitor H\* 7 pcs/edge

CA515 produces 43% longer tool life compared to competitor H's CVD. (User evaluation)

### 17Cr3

Gear  
Vc = 380 m/min  
ap = 1.5~2.0 mm  
f = 0.3~0.4 mm/rev  
Wet  
WNMG080408PQ



**CA515** 430 pcs/edge

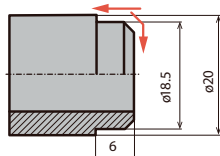
x1.1

Competitor I\* 380 pcs/edge

CA515 produces 13% longer tool life compared to competitor I's CVD. (User evaluation)

### Ust42-2

Machine Part  
Vc = 170 m/min  
ap = 0.8 mm  
f = 0.2 mm/rev  
Wet  
CNMG120408PQ



**CA525** 1,400 pcs/edge and more

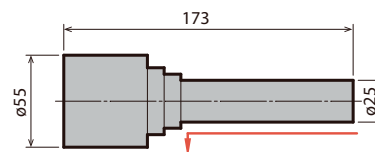
x1.4

Competitor J\* 800-1,000 pcs/edge

CA525 produces 43% longer tool life compared to competitor J's CVD. Chip control was smooth. (User evaluation)

### 20CrMo5

Shaft  
Vc = 120 m/min  
ap = 2.0 mm  
f = 0.25 mm/rev  
Dry  
TNMG160408R-ST



**CA525** 10 pcs/edge

x5

Competitor K\* 2 pcs/edge

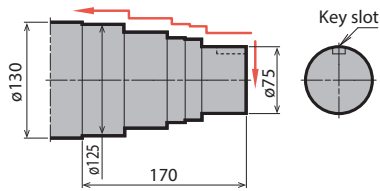
CA525 shows 5 times longer tool life compared to competitor K's CVD. (User evaluation)

\* CVD coated carbide

## Case studies

### C45

Shaft  
Vc = 250 m/min  
ap = 3.0 mm  
f = 0.3 mm/rev  
Wet  
CNMG120408PS



### CA525

**10 pcs/edge**

x1.6

Competitor L \*  
Competitor M \*\*

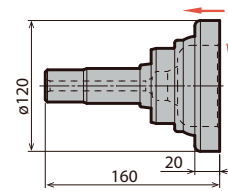
**6 pcs/edge**

**Instant breakage**

CA525 produces 66% longer tool life compared to competitor L's CVD. Competitor M's PVD carbide could not complete 1pc before breakage. (User evaluation)

### 20CrMo5

Flange shaft  
Vc = 260~280 m/min  
ap = 0.6 mm  
f = 0.3~0.5 mm/rev  
Wet  
CNMG120408PQ



### CA525

**180 pcs/edge**

x1.2

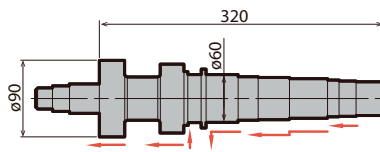
Competitor N \*

**150 pcs/edge**

CA525 produces 20% longer tool life compared to competitor N's CVD. (User evaluation)

### C45

Shaft  
Vc = 100 m/min  
ap = 2.0~4.0 mm  
f = 0.4 mm/rev  
Wet  
WNMG080408PS



### CA525

**70 pcs/edge**

x1.7

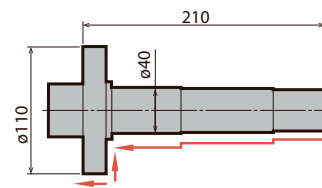
Competitor O \*

**40 pcs/edge**

CA525 produces 70% longer tool life compared to competitor O's CVD. (User evaluation)

### 20Cr4

Shaft  
Vc = 90 m/min  
ap = 2.0~3.0 mm  
f = 0.32 mm/rev  
Wet  
WNMG080408PS



### CA525

**260 pcs/edge**

x1.3

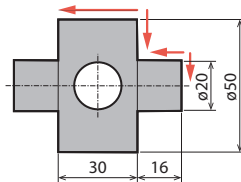
Competitor P \*

**190 pcs/edge**

CA525 produces 30% longer tool life compared to competitor P's CVD. (User evaluation)

### 17Cr3

Gear  
Vc = 180 m/min  
ap = 2.0 mm  
f = 0.2 mm/rev  
Wet  
DNMG150404CQ



### CA530

**10 pcs/edge**

x1.25

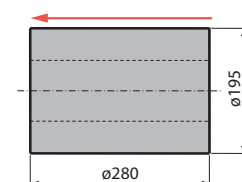
Competitor Q \*

**3-8 pcs/edge**

CA530 averages 25% longer tool life compared to competitor Q's CVD. (User evaluation)

### X6Cr13

Machine Parts  
Vc = 100 m/min  
ap = 2.0 mm  
f = 0.4 mm/rev  
Wet  
SNMG120412PH



### CA530

**9 pcs/edge**

x1.8

Efficiency  
x1.1%

Competitor R \*

**5 pcs/edge**

CA530 produces 80% longer tool life compared to competitor R's CVD. Improved machining efficiency by 1.1 times. (User evaluation)

\* CVD coated carbide

\*\* PVD coated carbide