MITSUBISHI MATERIALS

# MP/MX3115

## CERMET GRADE FOR TURNING STEEL





TOOL NEWS **B283A**

## Cermet Grade for Turning Steel

# MP/MX3115 NEW

**Through surface treatment and optimization of the cermet structure, suppression of dimensional changes of the workpiece and persistence of the finished surface are achieved.**




MP3115

### Features of the New Cermet

**AlTiN–AlCrN nano-multilayer coating**

Maintains a high-quality finished surface

**Surface structure with enhanced wear resistance**

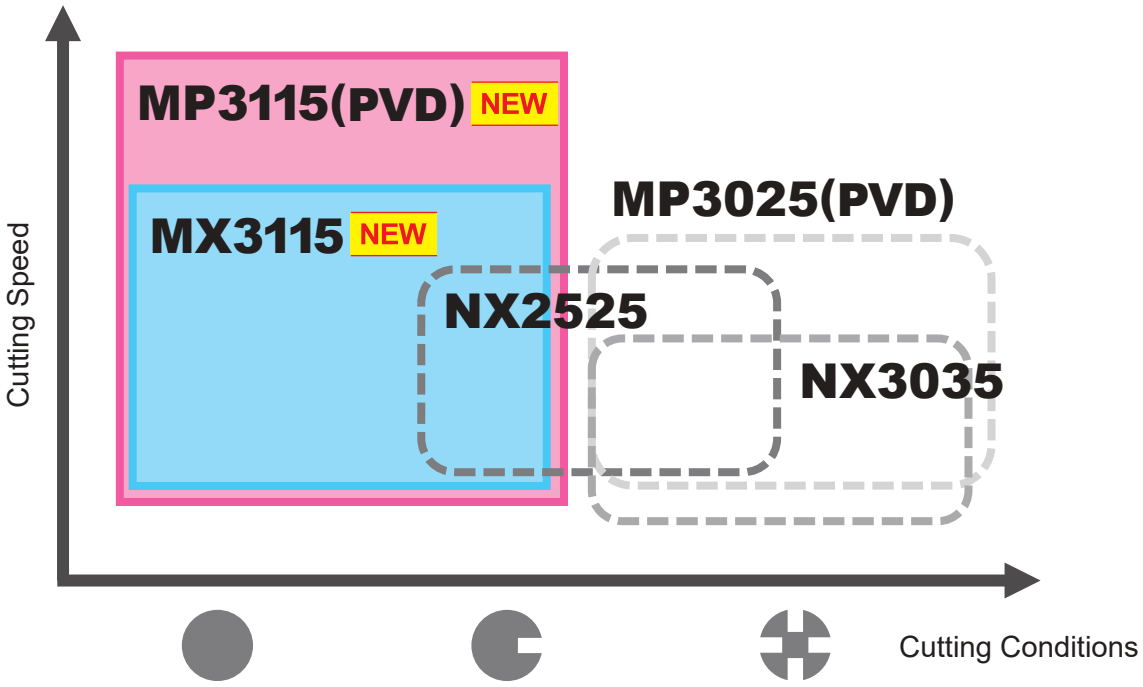
Suppresses dimensional changes of the workpiece

**Optimized binder-phase structure**

Improves wear and chipping resistance under high-speed cutting

## Cermet Grade for Turning

Within the cermet grade range, suitable for high-speed cutting at vc = 490 - 1150 SFM.



## Surface-Enhanced PVD Coating

Suppression of droplet-derived defects during coating deposition enhances surface smoothness, preventing reactions and adhesion with the workpiece material and maintaining a high-quality finished surface.

**MP3115**



Smooth surface

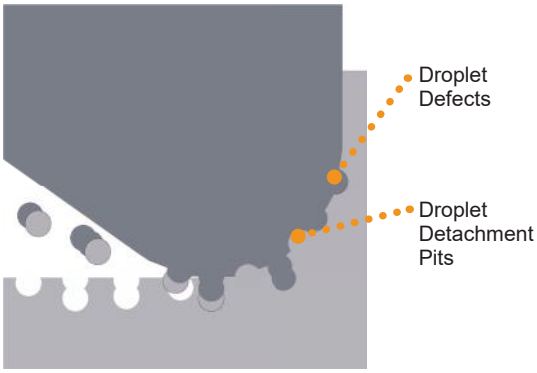



High-quality finished surface

Conventional



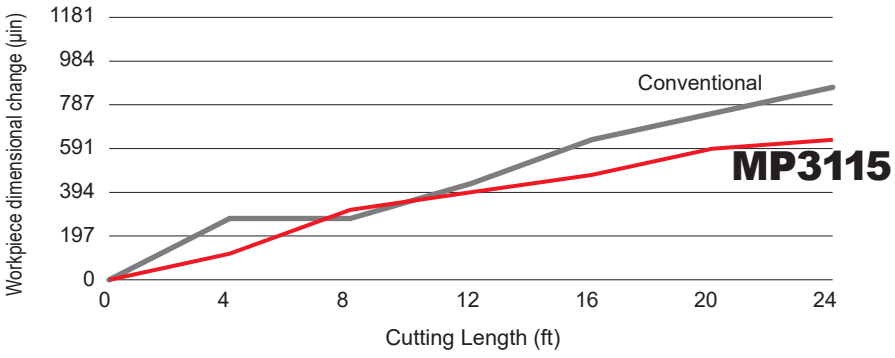
Droplet-induced uneven surface




Unevenness transferred to workpiece material

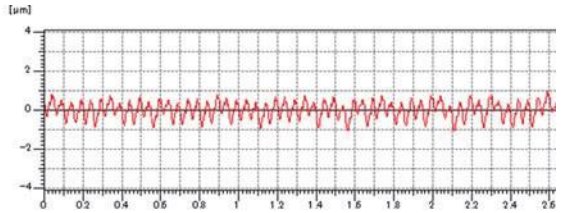
## 1045 Alloy Steel: Workpiece Dimensional Change and Surface Roughness Comparison

Compared with conventional products, surface roughness is improved by 39.4 µin (Rz) while initial workpiece dimensional change is reduced.

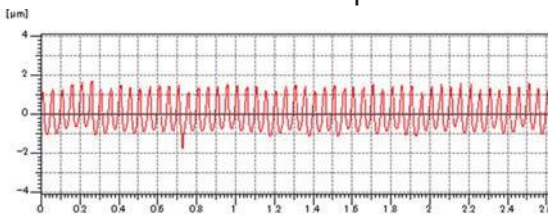



<Cutting Conditions>
Material : AISI 1045 Alloy Steel
Inserts : CCMT32.50.5-MP
Cutting Speed : vc = 820 SFM
Feed per Rev. : f = .002 IPR
Depth of Cut : ap = .020 in
Cutting Mode : Wet Cutting

**MP3115** Rz=71 µin

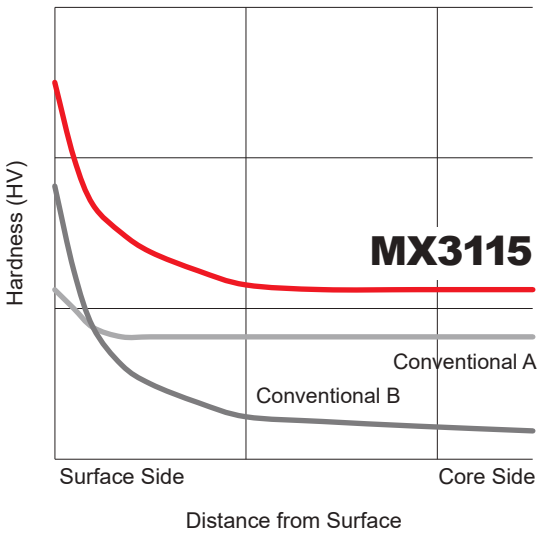


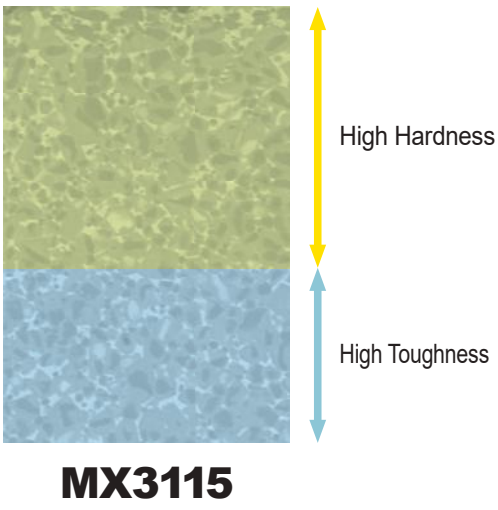

Conventional Rz=114 µin



## Extremely Hard Surface, Tough Core Cermet Grade

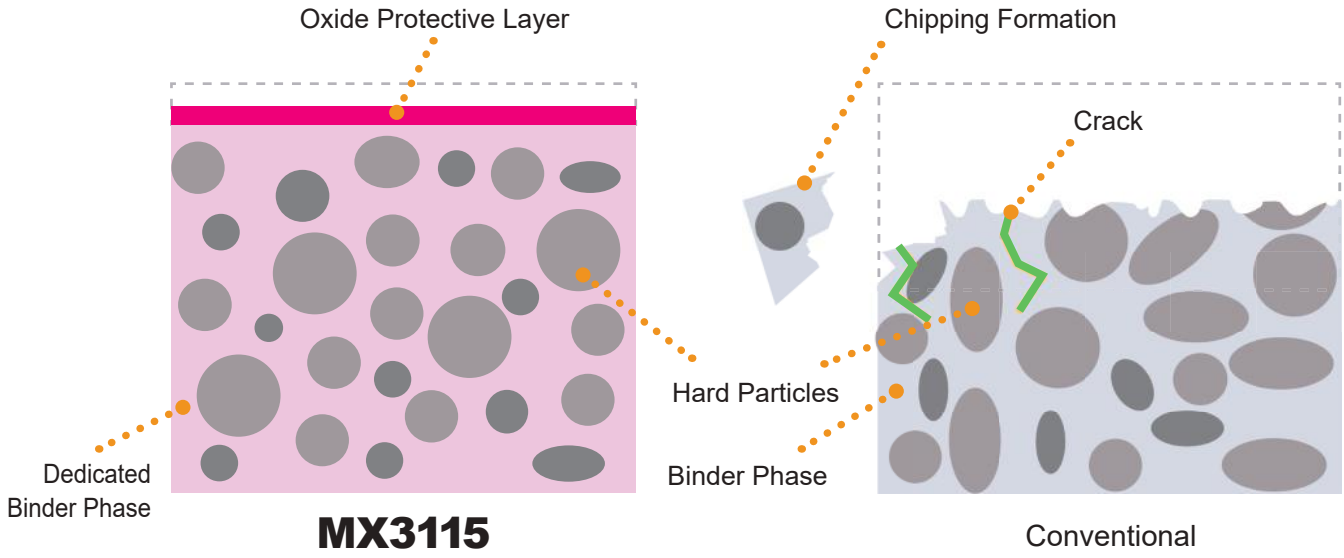
For stable finishing operations, surface hardness is further enhanced, while internal structure is optimized for toughness.




## Prevents Sudden Cutting Edge Failure

Oxide protective layer formed during cutting suppresses oxidation-related wear, while a dedicated binder phase inhibits crack growth and improves chipping resistance.

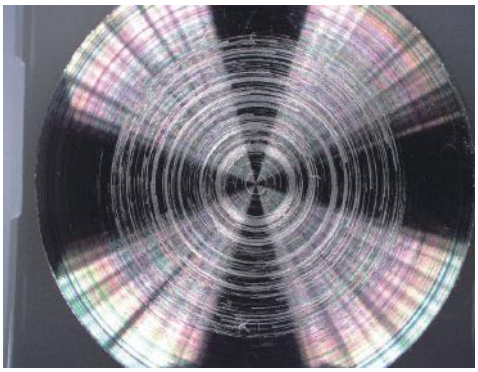


# Cutting Performance

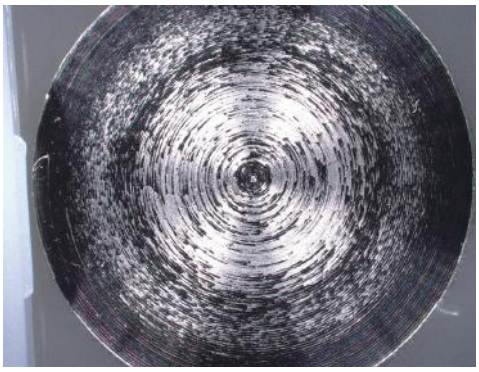
## 1045 Alloy Steel: Comparison of Workpiece Surface Appearance in Facing Wet Cutting

Even at the center of the low-speed cutting region, smooth, high-hardness surface suppresses adhesion and maintains high-quality finished surface.

### After machining 100 pieces



**MP3115**

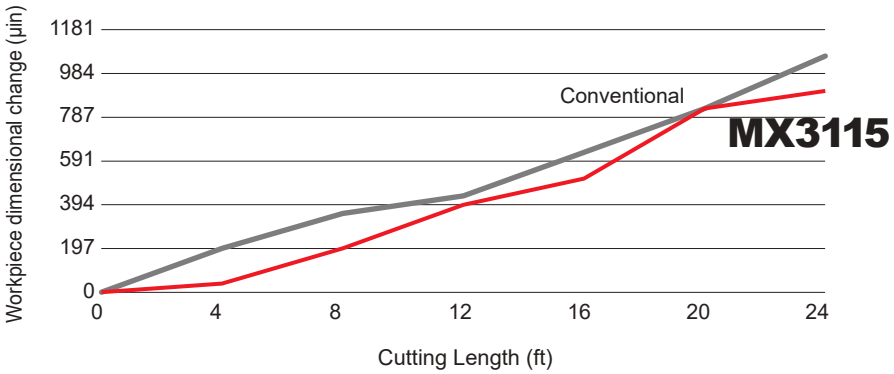


Conventional

<Cutting Conditions>
Material : AISI 1045 Alloy Steel
Inserts : DCMT32.50.5-FP
Cutting Speed : vc = 820 SFM
Feed per Rev. : f = .0008 IPR
Depth of Cut : ap = .008 in
Cutting Mode : Wet Cutting

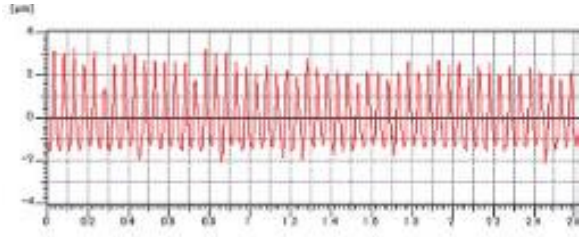
## 1045 Alloy Steel: Workpiece Dimensional Change and Surface Roughness Comparison

Even without coating, cermet shows small workpiece dimensional change and good surface roughness.

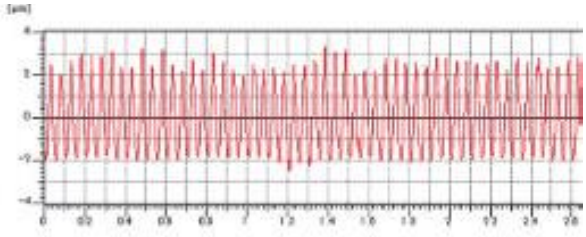



<Cutting Conditions>
Material : AISI 1045 Alloy Steel
Inserts : CCMT32.50.5-MP
Cutting Speed : vc = 820 SFM
Feed per Rev. : f = .002 IPR
Depth of Cut : ap = .020 in
Cutting Mode : Wet Cutting

**MX3115** Rz=193 µin

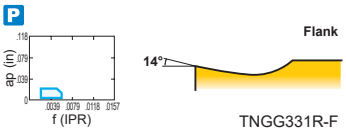


Conventional Rz=209 µin

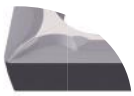
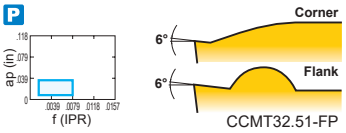
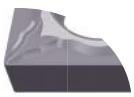
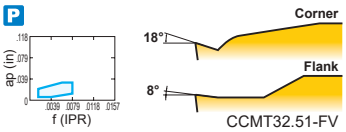
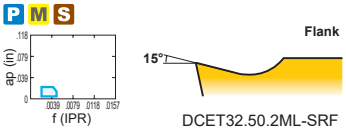
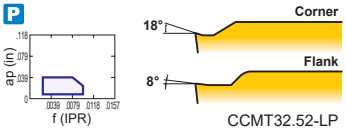
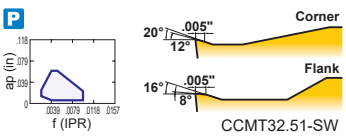
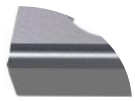
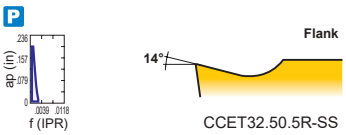


# CLASSIFICATION

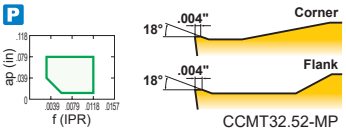
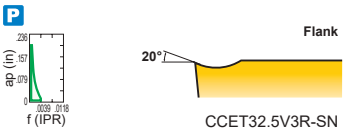
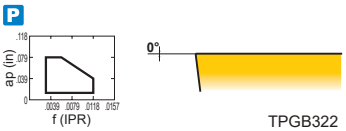
## Negative Inserts (with hole)

| Application | Tolerance | Chipbreaker Name and Picture | Features | Cross Section Geometry |
|---|---|---|---|---|
| Finish Cutting | G | R/L-F  | **Chipbreaker for finishing**<br>Lead chipbreaker controls chip flow. Sharp cutting edge gives a good surface finish. |  |

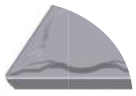
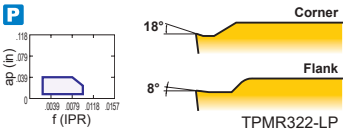
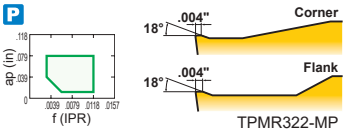
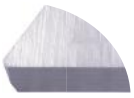
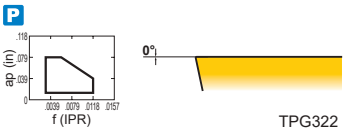
## Positive Inserts (with hole)

| Application | Tolerance | Chipbreaker Name and Picture | Features | Cross Section Geometry |
|---|---|---|---|---|
| Finish Cutting | M | FP  | **First recommendation for finishing carbon steel, alloy steel and mild steel**<br>Chipbreaker protrusion at the corner tip controls chips even at small depths of cut. Maintains the edge strength at the corner and prevents sudden fractures. |  |
| | | FV  | **Alternative chipbreaker for finishing carbon steel, alloy steel, mild steel and stainless steel**<br>Suitable for low depths of cut and low feed rates. Sharp cutting edge and low resistance design achieve excellent cutting performance. |  |
| | E | R/L-SRF  | **Chipbreaker for finishing**<br>Lead chipbreaker controls chip flow. Sharp cutting edge gives a good surface finish. |  |
| Light Cutting | M | LP  | **First recommendation for light cutting of carbon steel, alloy steel and mild steel**<br>Sharp cutting edge due to a large rake angle. Prevents welding of the insert and controls white turbidity of the surface finish. Chipbreaker protrusion suitable for depth of cut area achieves a wide range of chip control. |  |
| | | SW  | **Wiper insert for light cutting of carbon steel, alloy steel, mild steel and stainless steel**<br>In comparison to conventional chipbreakers, the surface finish is maintained even if the feed per revolution is doubled. Positive land improves sharpness. |  |
| | E | R/L-SS  | **Chipbreaker for light cutting of automatic lathe machining**<br>A parallel chipbreaker. Excellent chip control at low feed rates. |  |

## Positive Inserts (with hole)

| Application | Tolerance | Chipbreaker Name and Picture | Features | Cross Section Geometry |
|---|---|---|---|---|
| Medium Cutting | M | MP  | **First recommendation for medium cutting of carbon steel, alloy steel and mild steel**<br>Good balance of wear resistance and fracture resistance because of the flat land cutting edge. A wide chip pocket controls increasing of the cutting resistance and reduces vibration and chip jamming even at large depths of cut. | <br>CCMT32.52-MP |
| | E | R/L-SN  | **Chipbreaker for medium cutting of automatic lathe machining**<br>A parallel chipbreaker. Excellent chip control at low to medium feed rates. | <br>CCET32.5V3R-SN |
| Strong Cutting Edge | G | Flat Top  | **High Edge Strength Chipbreaker**<br>For CNC and manual lathes effective at moderately high cutting speeds and feed rates of approximately .004 in, where reinforced edge strength demonstrates its effectiveness. | <br>TPGB322 |

## Positive Inserts (without hole)

| Application | Tolerance | Chipbreaker Name and Picture | Features | Cross Section Geometry |
|---|---|---|---|---|
| Light Cutting | M | LP  | **First recommendation for light cutting of carbon steel, alloy steel and mild steel**<br>Sharp cutting edge due to a large rake angle. Prevents welding of the insert and controls white turbidity of the surface finish. Chipbreaker protrusion suitable for depth of cut area achieves a wide range of chip control. | <br>TPMR322-LP |
| Medium Cutting | M | MP  | **First recommendation for medium cutting of carbon steel, alloy steel and mild steel**<br>Good balance of wear resistance and fracture resistance because of the flat land cutting edge. A wide chip pocket controls increasing of the cutting resistance and reduces vibration and chip jamming even at large depths of cut. | <br>TPMR322-MP |
| Strong Cutting Edge | G | Flat Top  | **High Edge Strength Chipbreaker**<br>For CNC lathe and lathe, effective at moderately high cutting speeds and feed rates of approximately .004 in, where reinforced edge strength demonstrates its effectiveness. | <br>TPG322 |

# MP/MX3115 NEW

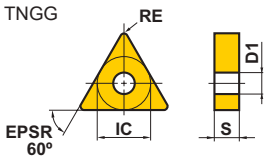
## Negative Inserts (with hole)

G Class

Medium

R/L-F





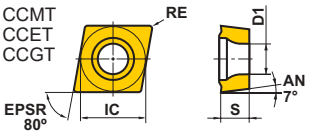

| Order Number | Cutting Area | MP3115 | MX3115 | Dimensions (in) | | | |
|---|---|---|---|---|---|---|---|
| | | | | IC | S | RE | D1 |
| **TNGG330.5RF** | F | ● | ● | .375 | .187 | .008 | .150 |
| **TNGG330.5LF** | F | ● | ● | .375 | .187 | .008 | .150 |
| **TNGG331RF** | F | ● | ● | .375 | .187 | .016 | .150 |
| **TNGG331LF** | F | ● | ● | .375 | .187 | .016 | .150 |
| **TNGG332RF** | F | ● | ● | .375 | .187 | .031 | .150 |
| **TNGG332LF** | F | ● | ● | .375 | .187 | .031 | .150 |

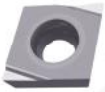
**● : USA Stock ★ : Stocked in Japan**

**10 inserts in one case.**

# 7° Positive Inserts (with hole)

E Class, G Class, M Class




| Finish | Finish | Finish | Light | Light | Light |
|---|---|---|---|---|---|
| FP | FV | R/L-SRF | LP | SW | R/L-SS |
|  |  |  |  |  (Wiper) |  |
| **Medium** | | | | | |
| MP | | | | | |
|  | | | | | |

| Order Number | Cutting Area | MP3115 | MX3115 | Dimensions (in) IC | S | RE | D1 |
|---|---|---|---|---|---|---|---|
| **CCMT21.50.5FP** | F | ● | ● | .250 | .094 | .008 | .110 |
| **CCMT21.51FP** | F | ● | ● | .250 | .094 | .016 | .110 |
| **CCMT32.50.5FP** | F | ● | ● | .375 | .156 | .008 | .173 |
| **CCMT32.51FP** | F | ● | ● | .375 | .156 | .016 | .173 |
| **CCMT32.52FP** | F | ● | ● | .375 | .156 | .031 | .173 |
| **CCMT21.50.5FV** | F | ● | ● | .250 | .094 | .008 | .110 |
| **CCMT21.51FV** | F | ● | ● | .250 | .094 | .016 | .110 |
| **CCMT32.50.5FV** | F | ● | ● | .375 | .156 | .008 | .173 |
| **CCMT32.51FV** | F | ● | ● | .375 | .156 | .016 | .173 |
| ***CCET03S101MR-SRF** | F | ● | | .156 | .055 | ≤.004 | .079 |
| ***CCET03S101ML-SRF** | F | ● | | .156 | .055 | ≤.004 | .079 |
| ***CCET03S102MR-SRF** | F | ● | | .156 | .055 | ≤.008 | .079 |
| ***CCET03S102ML-SRF** | F | ● | | .156 | .055 | ≤.008 | .079 |
| ***CCET03S104MR-SRF** | F | ● | | .156 | .055 | ≤.016 | .079 |
| ***CCET03S104ML-SRF** | F | ● | | .156 | .055 | ≤.016 | .079 |
| ***CCET04T001MR-SRF** | F | ● | | .187 | .070 | ≤.004 | .094 |
| ***CCET04T001ML-SRF** | F | ● | | .187 | .070 | ≤.004 | .094 |
| ***CCET04T002MR-SRF** | F | ● | | .187 | .070 | ≤.008 | .094 |
| ***CCET04T002ML-SRF** | F | ● | | .187 | .070 | ≤.008 | .094 |
| ***CCET04T004MR-SRF** | F | ● | | .187 | .070 | ≤.016 | .094 |
| ***CCET04T004ML-SRF** | F | ● | | .187 | .070 | ≤.016 | .094 |
| **CCMT21.50.5LP** | L | ● | ● | .250 | .094 | .008 | .110 |
| **CCMT21.51LP** | L | ● | ● | .250 | .094 | .016 | .110 |
| **CCMT32.50.5LP** | L | ● | ● | .375 | .156 | .008 | .173 |
| **CCMT32.51LP** | L | ● | ● | .375 | .156 | .016 | .173 |
| **CCMT32.52LP** | L | ● | ● | .375 | .156 | .031 | .173 |
| **CCMT21.50.5SW** | L | ● | ● | .250 | .094 | .008 | .110 |
| **CCMT21.51SW** | L | ● | ● | .250 | .094 | .016 | .110 |
| **CCMT21.52SW** | L | ● | ● | .250 | .094 | .031 | .110 |
| **CCMT32.50.5SW** | L | ● | ● | .375 | .156 | .008 | .173 |
| **CCMT32.51SW** | L | ● | ● | .375 | .156 | .016 | .173 |
| **CCMT32.52SW** | L | ● | ● | .375 | .156 | .031 | .173 |

* Diameter of inscribed circle is special. (For Micro-Dex)

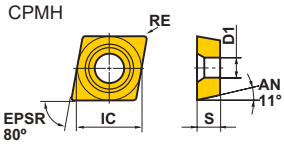
| Order Number | Cutting Area | MP3115 | MX3115 | Dimensions (in) IC | S | RE | D1 |
|---|---|---|---|---|---|---|---|
| **CCET21.50.2MRSS** | L | ● | | .250 | .094 | ≤.004 | .110 |
| **CCET21.50.2MLSS** | L | ● | | .250 | .094 | ≤.004 | .110 |
| **CCET21.50.5MRSS** | L | ● | | .250 | .094 | ≤.008 | .110 |
| **CCET21.50.5MLSS** | L | ● | | .250 | .094 | ≤.008 | .110 |
| **CCET21.51MRSS** | L | ● | | .250 | .094 | ≤.016 | .110 |
| **CCET21.51MLSS** | L | ● | | .250 | .094 | ≤.016 | .110 |
| **CCET32.50.2MRSS** | L | ● | | .375 | .156 | ≤.004 | .173 |
| **CCET32.50.2MLSS** | L | ● | | .375 | .156 | ≤.004 | .173 |
| **CCET32.50.5MRSS** | L | ● | | .375 | .156 | ≤.008 | .173 |
| **CCET32.50.5MLSS** | L | ● | | .375 | .156 | ≤.008 | .173 |
| **CCET32.51MRSS** | L | ● | | .375 | .156 | ≤.016 | .173 |
| **CCET32.51MLSS** | L | ● | | .375 | .156 | ≤.016 | .173 |
| **CCMT21.50.5MP** | M | ● | ● | .250 | .094 | .008 | .110 |
| **CCMT21.51MP** | M | ● | ● | .250 | .094 | .016 | .110 |
| **CCMT32.50.5MP** | M | ● | ● | .375 | .156 | .008 | .173 |
| **CCMT32.51MP** | M | ● | ● | .375 | .156 | .016 | .173 |
| **CCMT32.52MP** | M | ● | ● | .375 | .156 | .031 | .173 |
| **CCMT431MP** | M | ● | ● | .500 | .187 | .016 | .217 |
| **CCMT432MP** | M | ● | ● | .500 | .187 | .031 | .217 |
| **CCMT433MP** | M | ● | ● | .500 | .187 | .047 | .217 |
| **CCGT21.50.2MP** | M | ● | | .250 | .094 | .004 | .110 |
| **CCGT21.50.5MP** | M | ● | | .250 | .094 | .008 | .110 |
| **CCGT21.51MP** | M | ● | | .250 | .094 | .016 | .110 |
| **CCGT32.50.2MP** | M | ● | | .375 | .156 | .004 | .173 |
| **CCGT32.50.5MP** | M | ● | | .375 | .156 | .008 | .173 |
| **CCGT32.51MP** | M | ● | | .375 | .156 | .016 | .173 |

# MP/MX3115 NEW

## 11° Positive Inserts (with hole)

M Class

| Finish | Finish | Light | Medium |
|---|---|---|---|
| FP | FV | LP | MP |
|  |  |  |  |



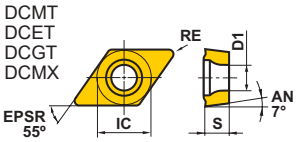

| Order Number | Cutting Area | MP3115 | MX3115 | Dimensions (in) | | | |
|---|---|---|---|---|---|---|---|
| | | | | IC | S | RE | D1 |
| **CPMH2.51.50.5FP** | F | ● | ● | .313 | .094 | .008 | .138 |
| **CPMH2.51.51FP** | F | ● | ● | .313 | .094 | .016 | .138 |
| **CPMH320.5FP** | F | ● | ● | .375 | .125 | .008 | .181 |
| **CPMH321FP** | F | ● | ● | .375 | .125 | .016 | .181 |
| **CPMH322FP** | F | ● | ● | .375 | .125 | .031 | .181 |
| **CPMH2.51.51FV** | F | ● | ● | .313 | .094 | .016 | .138 |
| **CPMH321FV** | F | ● | ● | .375 | .125 | .016 | .181 |
| **CPMH322FV** | F | ● | ● | .375 | .125 | .031 | .181 |
| **CPMH2.51.51LP** | L | ● | ● | .313 | .094 | .016 | .138 |
| **CPMH2.51.52LP** | L | ● | ● | .313 | .094 | .031 | .138 |
| **CPMH321LP** | L | ● | ● | .375 | .125 | .016 | .181 |
| **CPMH322LP** | L | ● | ● | .375 | .125 | .031 | .181 |
| **CPMH2.51.51MP** | M | ● | ● | .313 | .094 | .016 | .138 |
| **CPMH2.51.52MP** | M | ● | ● | .313 | .094 | .031 | .138 |
| **CPMH321MP** | M | ● | ● | .375 | .125 | .016 | .181 |
| **CPMH322MP** | M | ● | ● | .375 | .125 | .031 | .181 |

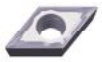
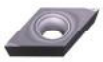
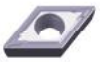
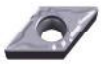
**● : USA Stock ★ : Stocked in Japan**

**10 inserts in one case.**

# 7° Positive Inserts (with hole)

E Class, G Class, M Class




| Finish | Finish | Finish | Light |
|---|---|---|---|
| FP | FV | R/L-SRF | LP |
|  |  |  |  |
| **Light** | **Light** | **Medium** | **Medium** |
| SW | R/L-SS | MP | R/L-SN |
|  (Wiper) |  |  |  |

| Order Number | Cutting Area | MP3115 | MX3115 | Dimensions (in) | | | |
|---|---|---|---|---|---|---|---|
| | | | | IC | S | RE | D1 |
| **DCMT21.50.5FP** | F | ● | ● | .250 | .094 | .008 | .110 |
| **DCMT21.51FP** | F | ● | ● | .250 | .094 | .016 | .110 |
| **DCMT32.50.5FP** | F | ● | ● | .375 | .156 | .008 | .173 |
| **DCMT32.51FP** | F | ● | ● | .375 | .156 | .016 | .173 |
| **DCMT32.52FP** | F | ● | ● | .375 | .156 | .031 | .173 |
| **DCMT21.50.5FV** | F | ● | ● | .250 | .094 | .008 | .110 |
| **DCMT21.51FV** | F | ● | ● | .250 | .094 | .016 | .110 |
| **DCMT32.51FV** | F | ● | ● | .375 | .156 | .016 | .173 |
| **DCMT32.52FV** | F | ● | ● | .375 | .156 | .031 | .173 |
| **DCET21.50.2MRSRF** | F | ● | | .250 | .094 | ≤.004 | .110 |
| **DCET21.50.2MLSRF** | F | ● | | .250 | .094 | ≤.004 | .110 |
| **DCET21.50.5MRSRF** | F | ● | | .250 | .094 | ≤.008 | .110 |
| **DCET21.50.5MLSRF** | F | ● | | .250 | .094 | ≤.008 | .110 |
| **DCET21.51MRSRF** | F | ● | | .250 | .094 | ≤.016 | .110 |
| **DCET21.51MLSRF** | F | ● | | .250 | .094 | ≤.016 | .110 |
| **DCET32.50.2MRSRF** | F | ● | | .375 | .156 | ≤.004 | .173 |
| **DCET32.50.2MLSRF** | F | ● | | .375 | .156 | ≤.004 | .173 |
| **DCET32.50.5MRSRF** | F | ● | | .375 | .156 | ≤.008 | .173 |
| **DCET32.50.5MLSRF** | F | ● | | .375 | .156 | ≤.008 | .173 |
| **DCET32.51MRSRF** | F | ● | | .375 | .156 | ≤.016 | .173 |
| **DCET32.51MLSRF** | F | ● | | .375 | .156 | ≤.016 | .173 |
| **DCMT21.50.5LP** | L | ● | ● | .250 | .094 | .008 | .110 |
| **DCMT21.51LP** | L | ● | ● | .250 | .094 | .016 | .110 |
| **DCMT21.52LP** | L | ● | ● | .250 | .094 | .031 | .110 |
| **DCMT32.50.5LP** | L | ● | ● | .375 | .156 | .008 | .173 |
| **DCMT32.51LP** | L | ● | ● | .375 | .156 | .016 | .173 |
| **DCMT32.52LP** | L | ● | ● | .375 | .156 | .031 | .173 |
| **DCMX21.50.5SW** | L | ● | ● | .250 | .094 | .008 | .110 |
| **DCMX21.51SW** | L | ● | ● | .250 | .094 | .016 | .110 |
| **DCMX21.52SW** | L | ● | ● | .250 | .094 | .031 | .110 |
| **DCMX32.50.5SW** | L | ● | ● | .375 | .156 | .008 | .173 |
| **DCMX32.51SW** | L | ● | ● | .375 | .156 | .016 | .173 |
| **DCMX32.52SW** | L | ● | ● | .375 | .156 | .031 | .173 |

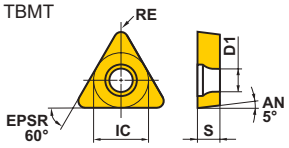
| Order Number | Cutting Area | MP3115 | MX3115 | Dimensions (in) | | | |
|---|---|---|---|---|---|---|---|
| | | | | IC | S | RE | D1 |
| **DCET21.50.2MRSS** | L | ● | | .250 | .094 | ≤.004 | .110 |
| **DCET21.50.2MLSS** | L | ● | | .250 | .094 | ≤.004 | .110 |
| **DCET21.50.5MRSS** | L | ● | | .250 | .094 | ≤.008 | .110 |
| **DCET21.50.5MLSS** | L | ● | | .250 | .094 | ≤.008 | .110 |
| **DCET32.50.2MRSS** | L | ● | | .375 | .156 | ≤.004 | .173 |
| **DCET32.50.2MLSS** | L | ● | | .375 | .156 | ≤.004 | .173 |
| **DCET32.50.5MRSS** | L | ● | | .375 | .156 | ≤.008 | .173 |
| **DCET32.50.5MLSS** | L | ● | | .375 | .156 | ≤.008 | .173 |
| **DCET32.51MRSS** | L | ● | | .375 | .156 | ≤.016 | .173 |
| **DCET32.51MLSS** | L | ● | | .375 | .156 | ≤.016 | .173 |
| **DCMT21.50.5MP** | M | ● | ● | .250 | .094 | .008 | .110 |
| **DCMT21.51MP** | M | ● | ● | .250 | .094 | .016 | .110 |
| **DCMT21.52MP** | M | ● | ● | .250 | .094 | .031 | .110 |
| **DCMT32.50.5MP** | M | ● | ● | .375 | .156 | .008 | .173 |
| **DCMT32.51MP** | M | ● | ● | .375 | .156 | .016 | .173 |
| **DCMT32.52MP** | M | ● | ● | .375 | .156 | .031 | .173 |
| **DCGT21.50.2MP** | M | ● | | .250 | .094 | .004 | .110 |
| **DCGT21.50.5MP** | M | ● | | .250 | .094 | .008 | .110 |
| **DCGT21.51MP** | M | ● | | .250 | .094 | .016 | .110 |
| **DCGT32.50.2MP** | M | ● | | .375 | .156 | .004 | .173 |
| **DCGT32.50.5MP** | M | ● | | .375 | .156 | .008 | .173 |
| **DCGT32.51MP** | M | ● | | .375 | .156 | .016 | .173 |
| **DCET32.50.2MRSN** | M | ● | | .375 | .156 | ≤.004 | .173 |
| **DCET32.50.2MLSN** | M | ● | | .375 | .156 | ≤.004 | .173 |
| **DCET32.50.5MRSN** | M | ● | | .375 | .156 | ≤.008 | .173 |
| **DCET32.50.5MLSN** | M | ● | | .375 | .156 | ≤.008 | .173 |
| **DCET32.51MRSN** | M | ● | | .375 | .156 | ≤.016 | .173 |
| **DCET32.51MLSN** | M | ● | | .375 | .156 | ≤.016 | .173 |

# MP/MX3115 NEW

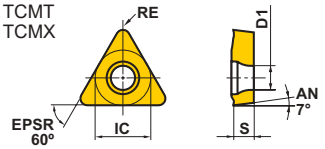
## 5°, 7°, 11° Positive Inserts (with hole)

G Class, M Class

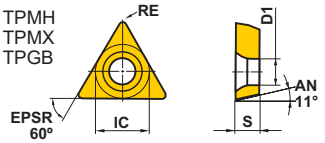
TBMT




TCMT
TCMX




TPMH
TPMX
TPGB




| Finish | Finish | Light | Light |
|---|---|---|---|
| FP | FV | LP | SW |
|  |  |  |  (Wiper) |
| Strong Cutting Edge | | | |
| Flat Top | | | |
|  | | | |

| Order Number | Cutting Area | MP3115 | MX3115 | Dimensions (in) IC | S | RE | D1 |
|---|---|---|---|---|---|---|---|
| **TBMT1.210.5FV** | F | ● | ● | .156 | .063 | .008 | .091 |
| **TBMT1.211FV** | F | ● | ● | .156 | .063 | .016 | .091 |

| Order Number | Cutting Area | MP3115 | MX3115 | Dimensions (in) IC | S | RE | D1 |
|---|---|---|---|---|---|---|---|
| **TCMT1.81.50.5LP** | L | ● | ● | .219 | .094 | .008 | .098 |
| **TCMT1.81.51LP** | L | ● | ● | .219 | .094 | .016 | .098 |
| **TCMT21.50.5LP** | L | ● | ● | .250 | .094 | .008 | .110 |
| **TCMT21.51LP** | L | ● | ● | .250 | .094 | .016 | .110 |
| **TCMT21.52LP** | L | ● | ● | .250 | .094 | .031 | .110 |
| **TCMX1.81.51SW** | L | ● | ● | .219 | .094 | .016 | .098 |
| **TCMX21.51SW** | L | ● | ● | .250 | .094 | .016 | .110 |

| Order Number | Cutting Area | MP3115 | MX3115 | Dimensions (in) IC | S | RE | D1 |
|---|---|---|---|---|---|---|---|
| **TPMH1.81.50.5FP** | F | ● | ● | .219 | .094 | .008 | .114 |
| **TPMH1.81.51FP** | F | ● | ● | .219 | .094 | .016 | .114 |
| **TPMH220.5FP** | F | ● | ● | .250 | .125 | .008 | .134 |
| **TPMH221FP** | F | ● | ● | .250 | .125 | .016 | .134 |
| **TPMH222FP** | F | ● | ● | .250 | .125 | .031 | .134 |
| **TPMH1.51.50.5FV** | F | ● | ● | .187 | .094 | .008 | .094 |
| **TPMH1.51.51FV** | F | ● | ● | .187 | .094 | .016 | .094 |
| **TPMH1.81.50.5FV** | F | ● | ● | .219 | .094 | .008 | .114 |
| **TPMH1.81.51FV** | F | ● | ● | .219 | .094 | .016 | .114 |
| **TPMH221FV** | F | ● | ● | .250 | .125 | .016 | .134 |
| **TPMH222FV** | F | ● | ● | .250 | .125 | .031 | .134 |
| **TPMH321FV** | F | ● | ● | .375 | .125 | .016 | .173 |
| **TPMH1.81.50.5LP** | L | ● | ● | .219 | .094 | .008 | .114 |
| **TPMH1.81.51LP** | L | ● | ● | .219 | .094 | .016 | .114 |
| **TPMH220.5LP** | L | ● | ● | .250 | .125 | .008 | .134 |
| **TPMH221LP** | L | ● | ● | .250 | .125 | .016 | .134 |
| **TPMH222LP** | L | ● | ● | .250 | .125 | .031 | .134 |
| **TPMH320.5LP** | L | ● | ● | .375 | .125 | .008 | .173 |
| **TPMH321LP** | L | ● | ● | .375 | .125 | .016 | .173 |
| **TPMH322LP** | L | ● | ● | .375 | .125 | .031 | .173 |
| **TPMX1.81.50.5SW** | L | ● | ● | .219 | .094 | .008 | .114 |
| **TPMX1.81.51SW** | L | ● | ● | .219 | .094 | .016 | .114 |
| **TPMX1.81.52SW** | L | ● | ● | .219 | .094 | .031 | .114 |
| **TPMX220.5SW** | L | ● | ● | .250 | .125 | .008 | .134 |
| **TPMX221SW** | L | ● | ● | .250 | .125 | .016 | .134 |
| **TPMX222SW** | L | ● | ● | .250 | .125 | .031 | .134 |
| **TPGB21.50.2** | – | ● | | .250 | .094 | .004 | .146 |
| **TPGB21.50.5** | – | ● | | .250 | .094 | .008 | .146 |
| **TPGB21.51** | – | ● | | .250 | .094 | .016 | .146 |
| **TPGB321** | – | ● | | .375 | .125 | .016 | .173 |
| **TPGB322** | – | ● | | .375 | .125 | .031 | .173 |

**● : USA Stock ★ : Stocked in Japan**

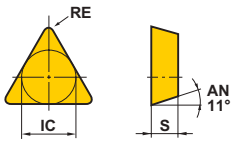
**10 inserts in one case.**

# 11° Positive Inserts (without hole)

G Class, M Class

| Light | Medium | Strong Cutting Edge |
|---|---|---|
| LP | MP | Flat Top |
|  |  |  |

TPMR
TPGN




| Order Number | Cutting Area | MP3115 | MX3115 | Dimensions (in) IC | S | RE | D1 |
|---|---|---|---|---|---|---|---|
| **TPMR321LP** | L | ● | ● | .375 | .125 | .016 | — |
| **TPMR322LP** | L | ● | ● | .375 | .125 | .031 | — |
| **TPMR221MP** | M | ● | ● | .250 | .125 | .016 | — |
| **TPMR222MP** | M | ● | ● | .250 | .125 | .031 | — |
| **TPMR321MP** | M | ● | ● | .375 | .125 | .016 | — |
| **TPMR322MP** | M | ● | ● | .375 | .125 | .031 | — |
| **TPG220.5** | — | ● | | .250 | .125 | .008 | — |
| **TPG221** | — | ● | | .250 | .125 | .016 | — |
| **TPG222** | — | ● | | .250 | .125 | .031 | — |
| **TPG321** | — | ● | | .375 | .125 | .016 | — |
| **TPG322** | — | ● | | .375 | .125 | .031 | — |

## Recommended Cutting Conditions

### Negative Inserts (For External Turning)

(in)

| | Material | Properties | Cutting Range | | Grade | Chipbreaker | Cutting Speed **vc** (SFM) | Feed **f** (IPR) | Depth of Cut **ap** |
|---|---|---|---|---|---|---|---|---|---|
| P | Mild Steel | ≤180HB | ● | F | **MP3115** | **R/L-F** | 935 — 1345 | .002 — .005 | .004 — .020 |
| | | | | | **MX3115** | **R/L-F** | 885 — 1180 | .002 — .005 | .004 — .020 |
| | Carbon Steel<br>Alloy Steel | 180 — 280HB | ● | F | **MP3115** | **R/L-F** | 690 — 1000 | .002 — .005 | .004 — .020 |
| | | | | | **MX3115** | **R/L-F** | 655 — 870 | .002 — .005 | .004 — .020 |
| | Carbon Steel<br>Alloy Steel | 280 — 350HB | ● | F | **MP3115** | **R/L-F** | 475 — 705 | .002 — .005 | .004 — .020 |
| | | | | | **MX3115** | **R/L-F** | 460 — 625 | .002 — .005 | .004 — .020 |

### 7° Positive Inserts (For External Turning)

(in)

| | Material | Properties | Cutting Range | | Grade | Chipbreaker | Cutting Speed **vc** (SFM) | Feed **f** (IPR) | Depth of Cut **ap** |
|---|---|---|---|---|---|---|---|---|---|
| P | Mild Steel | ≤180HB | ● | F | **MP3115** | **FP, FV** | 935 — 1345 | .002 — .008 | .008 — .035 |
| | | | | | **MX3115** | **FP, FV** | 885 — 1180 | .002 — .008 | .008 — .035 |
| | | | | | **MP3115** | **R/L-SRF** | 935 — 1345 | .002 — .005 | .008 — .024 |
| | | | | L | **MP3115** | **LP** | 935 — 1345 | .002 — .010 | .008 — .039 |
| | | | | | **MX3115** | **LP** | 885 — 1180 | .002 — .010 | .008 — .039 |
| | | | | | **MP3115** | **R/L-SS** | 935 — 1345 | .0004 — .004 | .004 — .197 |
| | | | | | **MP3115** | **SW** | 935 — 1345 | .002 — .009 | .008 — .059 |
| | | | | | **MX3115** | **SW** | 885 — 1180 | .002 — .009 | .008 — .059 |
| | | | | M | **MP3115** | **MP** | 770 — 1130 | .003 — .012 | .012 — .079 |
| | | | | | **MX3115** | **MP** | 740 — 985 | .003 — .012 | .012 — .079 |
| | | | | | **MP3115** | **R/L-SN** | 770 — 1130 | .0004 — .004 | .004 — .197 |
| | | | ◐ | F | **MP3115** | **FP, FV** | 935 — 1345 | .002 — .008 | .008 — .035 |
| | | | | | **MX3115** | **FP, FV** | 885 — 1180 | .002 — .008 | .008 — .035 |
| | | ≤180HB | ● | F | **MP3115** | **FP, FV** | 690 — 1000 | .002 — .008 | .008 — .035 |
| | | | | | **MX3115** | **FP, FV** | 655 — 870 | .002 — .008 | .008 — .035 |
| | | | | | **MP3115** | **R/L-SRF** | 690 — 1000 | .002 — .005 | .008 — .024 |
| | | | | L | **MP3115** | **LP** | 690 — 1000 | .002 — .010 | .008 — .039 |
| | | | | | **MX3115** | **LP** | 655 — 870 | .002 — .010 | .008 — .039 |
| | | | | | **MP3115** | **R/L-SS** | 690 — 1000 | .002 — .005 | .008 — .024 |
| | | | | | **MP3115** | **SW** | 690 — 1000 | .002 — .009 | .008 — .059 |
| | | | | | **MX3115** | **SW** | 655 — 870 | .002 — .009 | .008 — .059 |
| | | | | M | **MP3115** | **MP** | 575 — 835 | .003 — .012 | .012 — .079 |
| | | | | | **MX3115** | **MP** | 540 — 720 | .003 — .012 | .012 — .079 |
| | | | | | **MP3115** | **R/L-SN** | 575 — 835 | .0004 — .004 | .004 — .197 |
| | | | ◐ | F | **MP3115** | **FP, FV** | 690 — 1000 | .002 — .008 | .008 — .035 |
| | | | | | **MX3115** | **FP, FV** | 655 — 870 | .002 — .008 | .008 — .035 |

**Cutting Conditions**: ●: Stable Cutting ◐: General Cutting ✱: Unstable Cutting
**Cutting Area**: **F**: Finish Cutting **L**: Light Cutting **M**: Medium Cutting

## 7° Positive Inserts (For External Turning)

(in)

| | Material | Properties | Cutting Range | | Grade | Chipbreaker | Cutting Speed **vc** (SFM) | Feed **f** (IPR) | Depth of Cut **ap** |
|---|---|---|---|---|---|---|---|---|---|
| P | Carbon Steel<br>Alloy Steel | ≤180HB | ● | F | **MP3115** | **FP, FV** | 475 — 705 | .002 — .008 | .008 — .035 |
| | | | | | **MX3115** | **FP, FV** | 460 — 625 | .002 — .008 | .008 — .035 |
| | | | | | **MP3115** | **R/L-SRF** | 475 — 705 | .002 — .005 | .008 — .024 |
| | | | | L | **MP3115** | **LP** | 475 — 705 | .002 — .010 | .008 — .039 |
| | | | | | **MX3115** | **LP** | 460 — 625 | .002 — .010 | .008 — .039 |
| | | | | | **MP3115** | **R/L-SS** | 475 — 705 | .0004 — .004 | .004 — .197 |
| | | | | | **MP3115** | **SW** | 475 — 705 | .002 — .009 | .008 — .059 |
| | | | | | **MX3115** | **SW** | 460 — 625 | .002 — .009 | .008 — .059 |
| | | | | M | **MP3115** | **MP** | 395 — 590 | .003 — .012 | .012 — .079 |
| | | | | | **MX3115** | **MP** | 375 — 510 | .003 — .012 | .012 — .079 |
| | | | | | **MP3115** | **R/L-SN** | 395 — 590 | .0004 — .004 | .004 — .197 |
| | | | ◖ | F | **MP3115** | **FP, FV** | 475 — 705 | .002 — .008 | .008 — .035 |
| | | | | | **MX3115** | **FP, FV** | 460 — 625 | .002 — .008 | .008 — .035 |

## 11° Positive Inserts (For External Turning)

(in)

| | Material | Properties | Cutting Range | | Grade | Chipbreaker | Cutting Speed **vc** (SFM) | Feed **f** (IPR) | Depth of Cut **ap** |
|---|---|---|---|---|---|---|---|---|---|
| P | Mild Steel | ≤180HB | ● | F | **MP3115** | **FP, FV** | 935 — 1345 | .002 — .008 | .008 — .035 |
| | | | | | **MX3115** | **FP, FV** | 885 — 1180 | .002 — .008 | .008 — .035 |
| | | | | L | **MP3115** | **LP** | 935 — 1345 | .002 — .010 | .008 — .039 |
| | | | | | **MX3115** | **LP** | 885 — 1180 | .002 — .010 | .008 — .039 |
| | | | | | **MP3115** | **SW** | 935 — 1345 | .002 — .009 | .008 — .059 |
| | | | | | **MX3115** | **SW** | 885 — 1180 | .002 — .009 | .008 — .059 |
| | | | | M | **MP3115** | **MP** | 770 — 1130 | .003 — .012 | .012 — .079 |
| | | | | | **MX3115** | **MP** | 740 — 985 | .003 — .012 | .012 — .079 |
| | | | ◖ | F | **MP3115** | **FP, FV** | 935 — 1345 | .002 — .008 | .008 — .035 |
| | | | | | **MX3115** | **FP, FV** | 885 — 1180 | .002 — .008 | .008 — .035 |
| | Carbon Steel<br>Alloy Steel | 180 — 280HB | ● | F | **MP3115** | **FP, FV** | 690 — 1000 | .002 — .008 | .008 — .035 |
| | | | | | **MX3115** | **FP, FV** | 655 — 870 | .002 — .008 | .008 — .035 |
| | | | | L | **MP3115** | **LP** | 690 — 1000 | .002 — .010 | .008 — .039 |
| | | | | | **MX3115** | **LP** | 655 — 870 | .002 — .010 | .008 — .039 |
| | | | | | **MP3115** | **SW** | 690 — 1000 | .002 — .009 | .008 — .059 |
| | | | | | **MX3115** | **SW** | 655 — 870 | .002 — .009 | .008 — .059 |
| | | | | M | **MP3115** | **MP** | 575 — 835 | .003 — .012 | .012 — .079 |
| | | | | | **MX3115** | **MP** | 540 — 720 | .003 — .012 | .012 — .079 |
| | | | ◖ | F | **MP3115** | **FP, FV** | 690 — 1000 | .002 — .008 | .008 — .035 |
| | | | | | **MX3115** | **FP, FV** | 655 — 870 | .002 — .008 | .008 — .035 |
| | Carbon Steel<br>Alloy Steel | 280 — 350HB | ● | F | **MP3115** | **FP, FV** | 475 — 705 | .002 — .008 | .008 — .035 |
| | | | | | **MX3115** | **FP, FV** | 460 — 625 | .002 — .008 | .008 — .035 |
| | | | | L | **MP3115** | **LP** | 475 — 705 | .002 — .010 | .008 — .039 |
| | | | | | **MX3115** | **LP** | 460 — 625 | .002 — .010 | .008 — .039 |
| | | | | | **MP3115** | **SW** | 475 — 705 | .002 — .009 | .008 — .059 |
| | | | | | **MX3115** | **SW** | 460 — 625 | .002 — .009 | .008 — .059 |
| | | | | M | **MP3115** | **MP** | 395 — 590 | .003 — .012 | .012 — .079 |
| | | | | | **MX3115** | **MP** | 375 — 510 | .003 — .012 | .012 — .079 |
| | | | ◖ | F | **MP3115** | **FP, FV** | 475 — 705 | .002 — .008 | .008 — .035 |
| | | | | | **MX3115** | **FP, FV** | 460 — 625 | .002 — .008 | .008 — .035 |

## Recommended Cutting Conditions

### 5° 7° Positive Inserts (For Internal Turning)

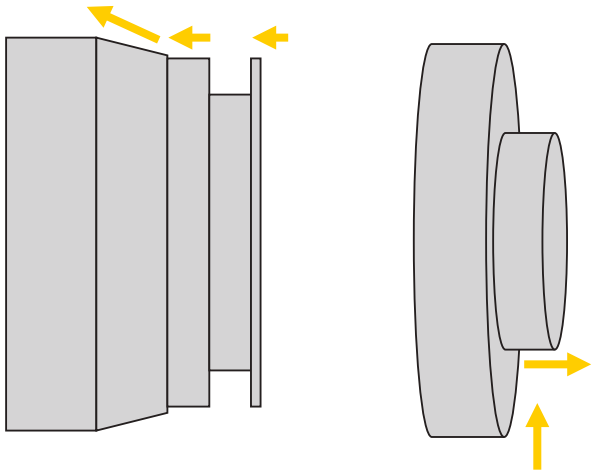
(in)

| | Material | Properties | Cutting Range | | Grade | Chipbreaker | Cutting Speed **vc** (SFM) | Feed **f** (IPR) | Depth of Cut **ap** |
|---|---|---|---|---|---|---|---|---|---|
| P | Mild Steel | ≤180HB | ● | F | **MP3115** | **FV** | 935 — 1345 | .002 — .008 | .008 — .035 |
| | | | | | **MX3115** | **FV** | 885 — 1180 | .002 — .008 | .008 — .035 |
| | | | ◕ | F | **MP3115** | **FV** | 935 — 1345 | .002 — .008 | .008 — .035 |
| | | | | | **MX3115** | **FV** | 885 — 1180 | .002 — .008 | .008 — .035 |
| | Carbon Steel Alloy Steel | 180 — 280HB | ● | F | **MP3115** | **FV** | 690 — 1000 | .002 — .008 | .008 — .035 |
| | | | | | **MX3115** | **FV** | 655 — 870 | .002 — .008 | .008 — .035 |
| | | | ◕ | F | **MP3115** | **FV** | 690 — 1000 | .002 — .008 | .008 — .035 |
| | | | | | **MX3115** | **FV** | 655 — 870 | .002 — .008 | .008 — .035 |
| | Carbon Steel Alloy Steel | 280 — 350HB | ● | F | **MP3115** | **FV** | 475 — 705 | .002 — .008 | .008 — .035 |
| | | | | | **MX3115** | **FV** | 460 — 625 | .002 — .008 | .008 — .035 |
| | | | ◕ | F | **MP3115** | **FV** | 475 — 705 | .002 — .008 | .008 — .035 |
| | | | | | **MX3115** | **FV** | 460 — 625 | .002 — .008 | .008 — .035 |

**Cutting Conditions**: ●: Stable Cutting ◕: General Cutting ✲: Unstable Cutting
**Cutting Area**: **F**: Finish Cutting

# Customer Application Example

## Front Turning



In machining of 1213 free-cutting steel, tool compensation was reduced to two-thirds.

After machining 1000 pieces



**MP3115**

Tool offset amount X=1811 µin,
Z=1575 µin



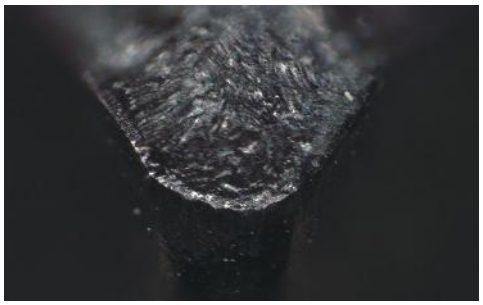
Conventional Chipping

Tool offset amount X=2559 µin,
Z=2953 µin

<Cutting Conditions>
Material : AISI 1213 free-cutting steel
Inserts : DCMT32.50.5-FP
MP3115
Cutting Speed : vc = 785 SFM
Feed per Rev. : f = .002 – .0028 IPR
Depth of Cut : ap = .007 in
Cutting Mode : Wet Cutting

Reduced chipping and wear in machining of 1043 carbon steel.

After machining 7000 pieces



**MP3115**



Conventional Chipping

<Cutting Conditions>
Material : AISI 1043 carbon steel,
JIS S43S2
Inserts : DCMT32.50.5-FP
MP3115
Cutting Speed : vc = 590 – 655 SFM
Feed per Rev. : f = .0028 IPR
Depth of Cut : ap = .007 in
Cutting Mode : Wet Cutting

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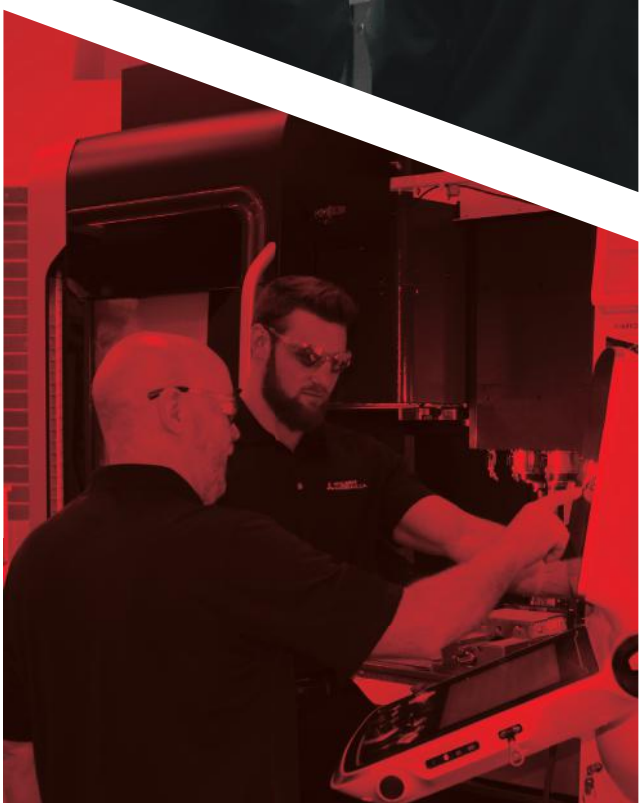
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## FOR YOUR SAFETY

- Don't handle inserts and chips without gloves.
- Please machine within the recommended application range and exchange expired tools with new ones in advance of breakage.
- Please use safety covers and wear safety glasses.
- When using compounded cutting oils, please take fire precautions.
- When attaching inserts or spare parts, please use only the correct wrench or driver.
- When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

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Tools specifications subject to change without notice.

B283A-US-2026.11