

PCD

CUTTING TOOLS

Polycrystalline Diamond Turning Inserts

Precision Edges. Abrasive Wear Resistance.



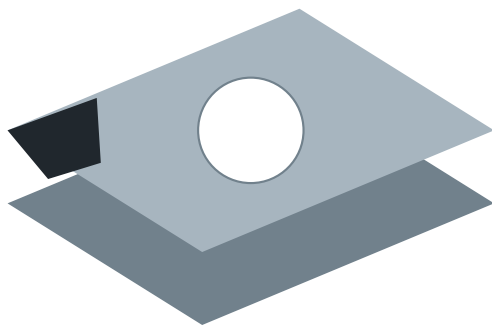
MPD GRADE SERIES

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Conventional PCD

Polycrystalline diamond combines diamond grains with a metallic binder. A brazed PCD cutting tip on a carbide body provides a wear-resistant edge with a practical insert mounting system.



PCD Cutting Tip

Diamond cutting material at the working corner.

Carbide Body

Supports the tip and locates the insert in the toolholder.

Non-Ferrous And Abrasive Materials

Aluminum alloys, copper alloys, selected plastics, graphite and metal matrix composites are common PCD applications.

Match The Edge To The Workpiece

Select grain structure, geometry and edge preparation together. A sharper edge favors low cutting forces; abrasive workpieces place greater demands on wear resistance.

PCD is generally unsuitable for routine cutting of steels and other ferrous alloys because diamond reacts with iron at elevated cutting temperatures.

PCD Grade Overview

Grade	Nominal Grain Size	Grain Family	Application Focus
MPD85	Submicron	Ultra-Fine	Precision finishing of aluminum alloys and composite components.
MPD02	2 µm	Fine	Profile and thread turning, non-ferrous components, plastics and wear-resistant parts.
MPD05	5 µm	Fine	Fine finishing of aluminum alloys, PMMA and precision non-ferrous contours.
MPD10	10 µm	Medium	General turning and roughing of low- to medium-silicon aluminum alloys; piston components.
MPD25	25 µm	Coarse	High-silicon aluminum, MMC and graphite. Cemented carbide and ceramics require application-specific trials.
MPD302	Mixed-Grain	Mixed	High-silicon aluminum alloys, MMC and bimetallic components; evaluate each constituent material.

Particle size is a material descriptor. Tool performance also depends on grain distribution, binder system, tip geometry, edge preparation and machining conditions.

Ultra-Fine And Fine Grades

MPD85

Submicron

Material Characteristics

Sharp edges and fine edge integrity for precision machining.

Turning Applications

Precision finishing of aluminum alloys and composite components.

MPD02

2 μ m

Material Characteristics

A balance of toughness, edge quality and electrical-discharge processability.

Turning Applications

Profile and thread turning, non-ferrous components, plastics and wear-resistant parts.

Electrical-discharge processability describes tool fabrication; it does not define cutting performance on a workpiece.

Fine And General-Purpose Grades

MPD05

5 μm

Material Characteristics

Balanced wear resistance and edge quality with good electrical-discharge processability.

Turning Applications

Fine finishing of aluminum alloys, PMMA and precision non-ferrous contours.

MPD10

10 μm

Material Characteristics

A general-purpose balance of toughness and abrasive wear resistance.

Turning Applications

General turning and roughing of low- to medium-silicon aluminum alloys; piston components.

Electrical-discharge processability describes tool fabrication; it does not define cutting performance on a workpiece.

Abrasive Wear Grades

MPD25

25 μm

Material Characteristics

Wear-focused grade for abrasive workpieces.

Turning Applications

High-silicon aluminum, MMC and graphite. Cemented carbide and ceramics require application-specific trials.

MPD302

Mixed-Grain

Material Characteristics

Fine and coarse diamond grains combined for balanced edge integrity and wear resistance.

Turning Applications

High-silicon aluminum alloys, MMC and bimetallic components; evaluate each constituent material.

Electrical-discharge processability describes tool fabrication; it does not define cutting performance on a workpiece.

Workpiece Selection

Workpiece	Grade Candidates	Selection Focus
Low- / medium-silicon aluminum	MPD85 / MPD02 / MPD05 / MPD10	Prioritize finish, edge integrity and machine stability.
High-silicon aluminum	MPD25 / MPD302; MPD10 for comparison	Assess abrasive wear and surface finish in trials.
Copper alloys / non-ferrous profiles	MPD02 / MPD05 / MPD85	Use a sharp, well-finished edge and control built-up edge.
MMC	MPD25 / MPD302	Consider reinforcement content, particle size and interrupted loading.
PMMA / selected plastics	MPD05 / MPD02 / MPD85	Limit heat generation and preserve edge sharpness.
Composite materials	MPD85 / MPD302	Evaluate fiber damage, delamination and edge wear.
Graphite	MPD25 / MPD10	Use abrasion-resistant edges and effective dust extraction.
Cemented carbide / ceramics	MPD25; application trials required	Distinguish green, semi-sintered and fully sintered materials.
Bimetallic components	MPD302; application review required	Check each material and its compatibility with PCD.

These candidates guide trials. Grain size alone does not establish an optimum grade or a guaranteed tool-life ranking.

Selection Workflow

01 Identify The Material

Record alloy designation, silicon or reinforcement content, hardness, heat treatment and abrasive phases.

02 Define The Operation

Specify external turning, facing, boring, profiling or thread turning. Record interruption and required surface finish.

03 Choose Grain Structure

Begin with fine grades for edge-sensitive finishing; compare medium, coarse or mixed grades as abrasion increases.

04 Choose Geometry And Edge

Check holder seating, clearance, corner radius, PCD edge length and access to the profile.

05 Run A Controlled Trial

Record speed, feed, depth of cut, coolant, wear mode, finish and tool life. Change one main variable at a time.

General Turning Envelope

Workpiece	vc (m/min)	f (mm/rev)	ap (mm)
Aluminum alloys	Up to 3,000	Up to 0.2	Up to 3
Copper alloys	Up to 1,000	Up to 0.2	Up to 3
Reinforced plastics	Up to 1,000	Up to 0.4	Up to 2
Cemented carbide	Up to 30	Up to 0.2	Up to 0.5
Carbon materials	100-600	Up to 1.0	Up to 2

These broad conventional-PCD reference limits are not simultaneous targets or grade-specific Huamin cutting windows. Start conservatively and increase only after checking rigidity, temperature, edge wear and surface quality.

Cutting Speed

Use lower speeds for highly abrasive or hard-brittle workpieces. The acceptable range depends on the actual material and operation.

Feed And Depth Of Cut

Keep the active cut within the PCD tip. Confirm clearance, cutting-edge engagement and chip evacuation before increasing load.

Turning Calculations

Spindle Speed

$$n = 1000 \times vc / (\pi \times D)$$

n: rev/min vc: m/min D: workpiece diameter in mm

Feed Speed

$$vf = f \times n$$

vf: mm/min f: mm/rev n: rev/min

Ideal Geometric Roughness

$$Ra \approx f^2 / (32 \times r)$$

Ra and r use mm; multiply Ra by 1000 for μm . This geometric estimate assumes a stable cut and an undamaged circular nose.

Calculation Example

For D = 50 mm, vc = 500 m/min and f = 0.10 mm/rev: $n \approx 3,183$ rev/min and $vf \approx 318$ mm/min. With r = 0.4 mm, ideal Ra $\approx 0.78 \mu\text{m}$.

Actual roughness also depends on edge quality, material, vibration, built-up edge and machine condition. Observe machine and chuck speed limits.

Insert Designation

CCMT 09T304

Code	Meaning	Example
C	Insert shape	80° rhombic / diamond
C	Normal clearance	7°
M	Tolerance class	ISO tolerance designation
T	Insert type	Hole / top-face configuration; verify drawing
09	Size designation	Family-specific size code
T3	Thickness designation	3.97 mm for this example
04	Corner radius	0.4 mm

Dimensions And Compatibility

The designation does not specify PCD grain size, tip count, PCD layer thickness, edge length or chipbreaker. Order these separately and verify the holder interface.

ISO-style model codes are used for communication. The product drawing controls the manufactured geometry.

Edge Preparation

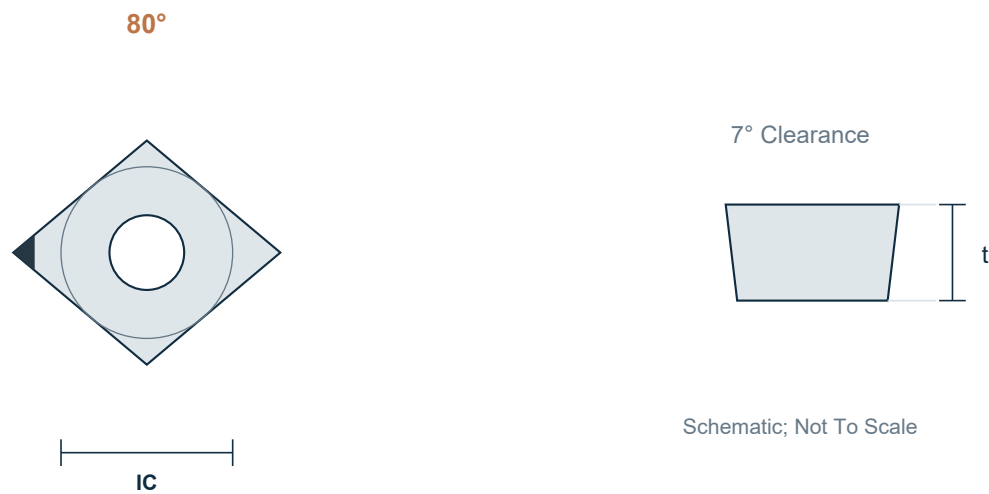
Edge Form	Typical Use	Trade-Off
Sharp / finely finished	Precision finishing, plastics and low-force non-ferrous cutting	Prioritizes sharpness; avoid impact and poor seating.
Lightly honed	Applications needing improved edge integrity	May increase cutting forces; confirm finish in trials.
Chamfered / reinforced	Higher edge loads or selected interrupted operations	Specify chamfer width and angle; verify material compatibility.
Chip-control geometry	Ductile non-ferrous materials producing long chips	Select a feed / depth combination that activates chip control.

Specify The Edge

Include corner radius, edge finish, hone size or chamfer dimensions, PCD cutting-edge length and any chip-control feature on the order drawing.

No universal hone or chamfer value suits all PCD grades. Confirm the actual edge specification for the application.

CCMW



IC: Inscribed Circle t: Thickness d: Hole Diameter r: Corner Radius

LE: PCD Cutting-Edge Length Dimensions In mm

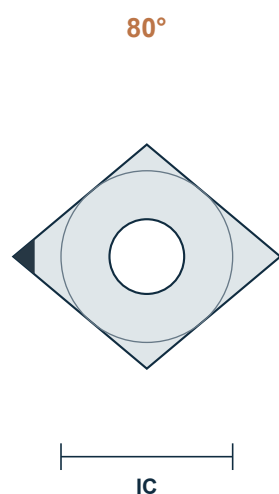
ISO / Model	IC	t	d	r	LE
CCMW 060202	6.35	2.38	2.80	0.2	2.4
CCMW 060204	6.35	2.38	2.80	0.4	2.4
CCMW 09T302	9.525	3.97	4.40	0.2	2.4
CCMW 09T304	9.525	3.97	4.40	0.4	2.4
CCMW 09T308	9.525	3.97	4.40	0.8	2.3

Grade Selection

MPD85 / MPD02 / MPD05 / MPD10 / MPD25 / MPD302

Choose the grade for the workpiece and operation. Tip layout, edge form and cutting-edge length are specified on the product drawing.

CCMT



7° Clearance



Schematic; Not To Scale

IC: Inscribed Circle t: Thickness d: Hole Diameter r: Corner Radius

LE: PCD Cutting-Edge Length Dimensions In mm

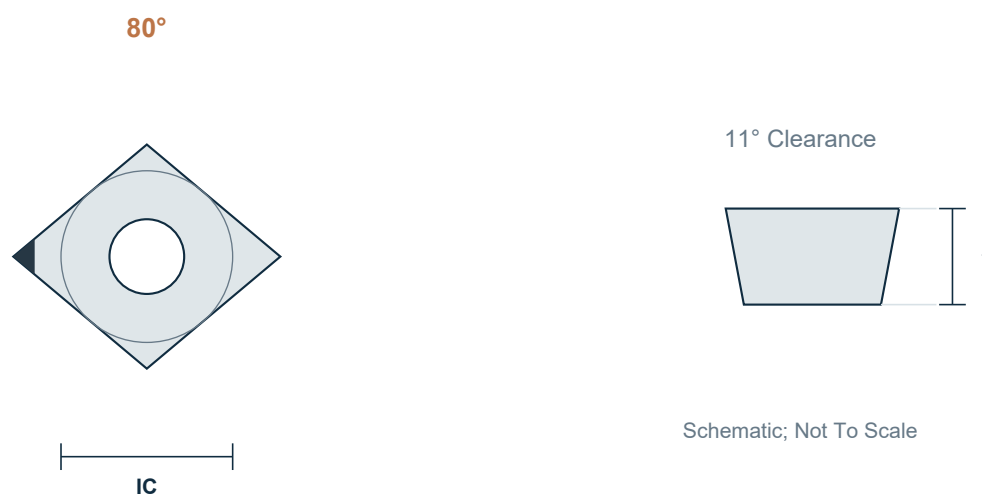
ISO / Model	IC	t	d	r	LE
CCMT 060201	6.35	2.38	2.80	0.1	2.8
CCMT 060202	6.35	2.38	2.80	0.2	2.8
CCMT 060204	6.35	2.38	2.80	0.4	2.8
CCMT 09T301	9.525	3.97	4.40	0.1	2.8
CCMT 09T302	9.525	3.97	4.40	0.2	2.8
CCMT 09T304	9.525	3.97	4.40	0.4	2.8
CCMT 09T308	9.525	3.97	4.40	0.8	2.7

Grade Selection

MPD85 / MPD02 / MPD05 / MPD10 / MPD25 / MPD302

Choose the grade for the workpiece and operation. Tip layout, edge form and cutting-edge length are specified on the product drawing.

CPMT



IC: Inscribed Circle t: Thickness d: Hole Diameter r: Corner Radius

LE: PCD Cutting-Edge Length Dimensions In mm

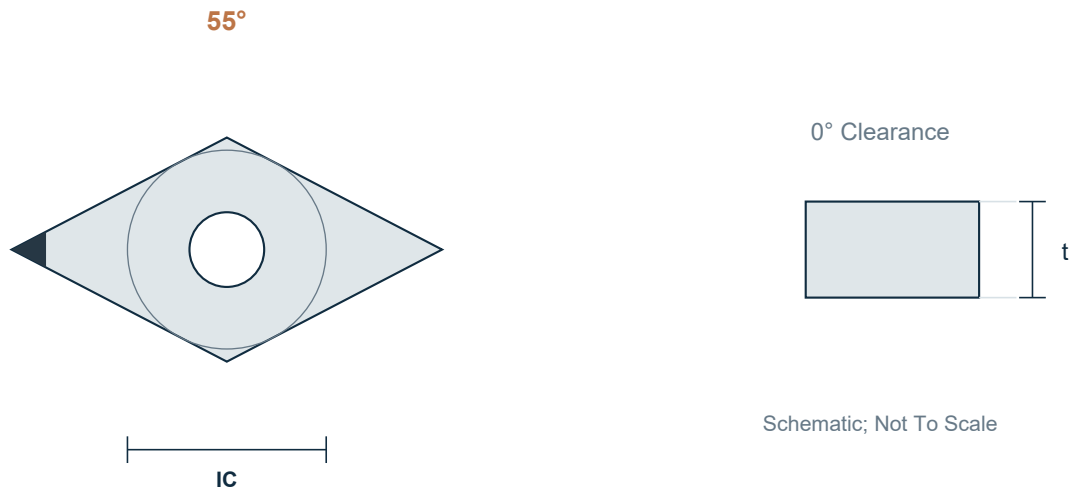
ISO / Model	IC	t	d	r	LE
CPMT 090302	9.525	3.18	4.40	0.2	2.8
CPMT 090304	9.525	3.18	4.40	0.4	2.8
CPMT 090308	9.525	3.18	4.40	0.8	2.7

Grade Selection

MPD85 / MPD02 / MPD05 / MPD10 / MPD25 / MPD302

Choose the grade for the workpiece and operation. Tip layout, edge form and cutting-edge length are specified on the product drawing.

DNMA



IC: Inscribed Circle t: Thickness d: Hole Diameter r: Corner Radius

LE: PCD Cutting-Edge Length Dimensions In mm

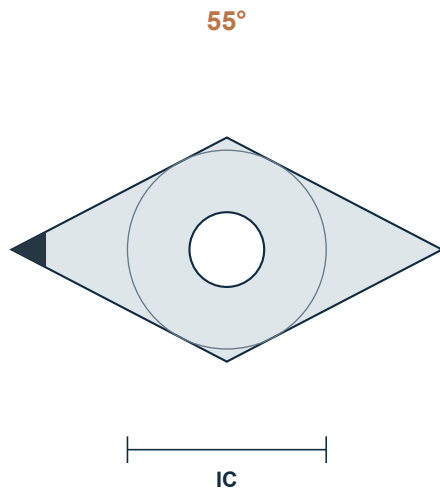
ISO / Model	IC	t	d	r	LE
DNMA 150408	12.7	4.76	5.60	0.8	2.0
DNMA 150412	12.7	4.76	5.60	1.2	2.0

Grade Selection

MPD85 / MPD02 / MPD05 / MPD10 / MPD25 / MPD302

Choose the grade for the workpiece and operation. Tip layout, edge form and cutting-edge length are specified on the product drawing.

DCMW



7° Clearance



Schematic; Not To Scale

IC: Inscribed Circle t: Thickness d: Hole Diameter r: Corner Radius

LE: PCD Cutting-Edge Length Dimensions In mm

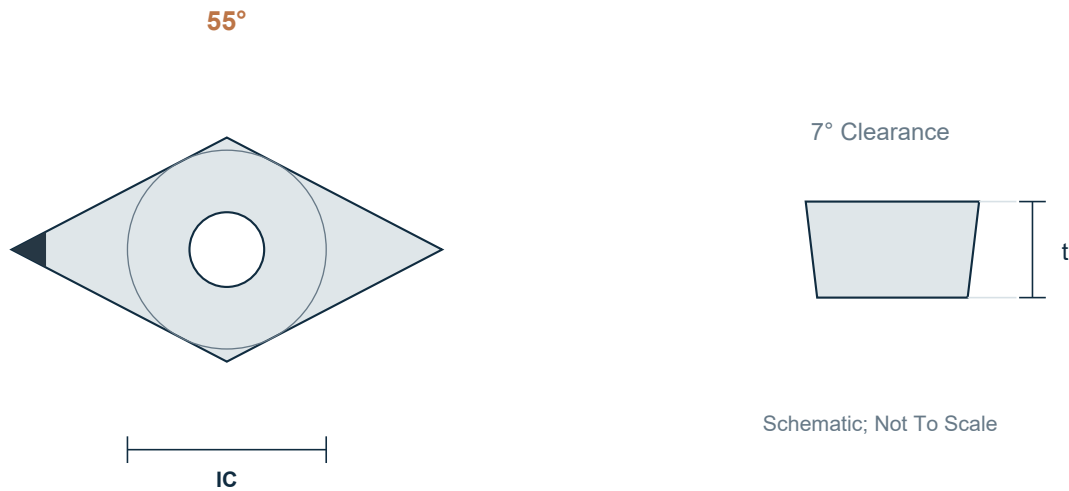
ISO / Model	IC	t	d	r	LE
DCMW 070202	6.35	2.38	2.80	0.2	2.6
DCMW 070204	6.35	2.38	2.80	0.4	2.4
DCMW 11T302	9.525	3.97	4.40	0.2	2.6
DCMW 11T304	9.525	3.97	4.40	0.4	2.4
DCMW 11T308	9.525	3.97	4.40	0.8	2.0

Grade Selection

MPD85 / MPD02 / MPD05 / MPD10 / MPD25 / MPD302

Choose the grade for the workpiece and operation. Tip layout, edge form and cutting-edge length are specified on the product drawing.

DCMT



IC: Inscribed Circle t: Thickness d: Hole Diameter r: Corner Radius

LE: PCD Cutting-Edge Length Dimensions In mm

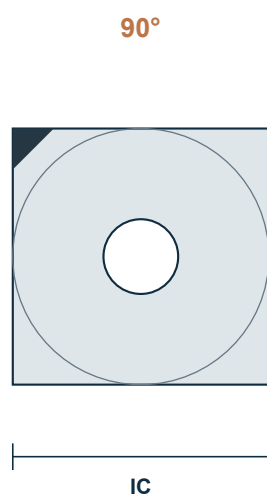
ISO / Model	IC	t	d	r	LE
DCMT 070201	6.35	2.38	2.80	0.1	3.0
DCMT 070202	6.35	2.38	2.80	0.2	3.0
DCMT 070204	6.35	2.38	2.80	0.4	2.8
DCMT 11T301	9.525	3.97	4.40	0.1	3.0
DCMT 11T302	9.525	3.97	4.40	0.2	3.0
DCMT 11T304	9.525	3.97	4.40	0.4	2.8
DCMT 11T308	9.525	3.97	4.40	0.8	2.4

Grade Selection

MPD85 / MPD02 / MPD05 / MPD10 / MPD25 / MPD302

Choose the grade for the workpiece and operation. Tip layout, edge form and cutting-edge length are specified on the product drawing.

SCMT



7° Clearance



Schematic; Not To Scale

IC: Inscribed Circle t: Thickness d: Hole Diameter r: Corner Radius

LE: PCD Cutting-Edge Length Dimensions In mm

ISO / Model	IC	t	d	r	LE
SCMT 070201	7.94	2.38	3.40	0.1	2.9
SCMT 070202	7.94	2.38	3.40	0.2	2.9
SCMT 070204	7.94	2.38	3.40	0.4	2.9

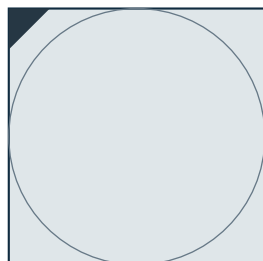
Grade Selection

MPD85 / MPD02 / MPD05 / MPD10 / MPD25 / MPD302

Choose the grade for the workpiece and operation. Tip layout, edge form and cutting-edge length are specified on the product drawing.

SPGN

90°



IC

11° Clearance



Schematic; Not To Scale

IC: Inscribed Circle t: Thickness d: Hole Diameter r: Corner Radius

LE: PCD Cutting-Edge Length Dimensions In mm

ISO / Model	IC	t	d	r	LE
SPGN 090304	9.525	3.18	-	0.4	4.8
SPGN 090308	9.525	3.18	-	0.8	4.8
SPGN 120304	12.7	3.18	-	0.4	4.8
SPGN 120308	12.7	3.18	-	0.8	4.8

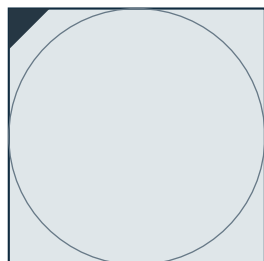
Grade Selection

MPD85 / MPD02 / MPD05 / MPD10 / MPD25 / MPD302

Choose the grade for the workpiece and operation. Tip layout, edge form and cutting-edge length are specified on the product drawing.

SEGN

90°



IC

20° Clearance



Schematic; Not To Scale

IC: Inscribed Circle t: Thickness d: Hole Diameter r: Corner Radius

LE: PCD Cutting-Edge Length Dimensions In mm

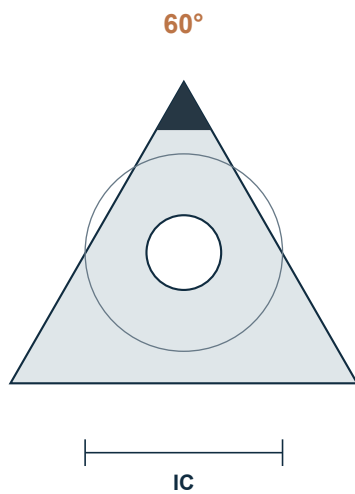
ISO / Model	IC	t	d	r	LE
SEGN 090302	9.525	3.18	-	0.2	4.8
SEGN 120302	12.7	3.18	-	0.2	4.8

Grade Selection

MPD85 / MPD02 / MPD05 / MPD10 / MPD25 / MPD302

Choose the grade for the workpiece and operation. Tip layout, edge form and cutting-edge length are specified on the product drawing.

TCMT



7° Clearance



Schematic; Not To Scale

IC: Inscribed Circle t: Thickness d: Hole Diameter r: Corner Radius

LE: PCD Cutting-Edge Length Dimensions In mm

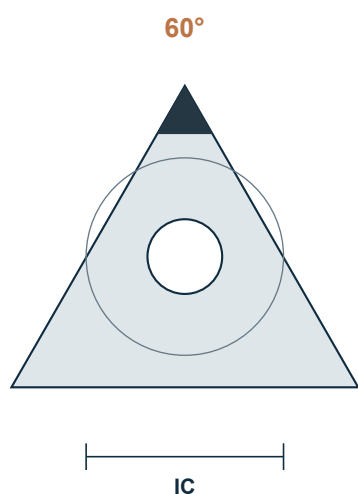
ISO / Model	IC	t	d	r	LE
TCMT 110201	6.35	2.38	2.80	0.1	3.0
TCMT 110202	6.35	2.38	2.80	0.2	2.9
TCMT 110204	6.35	2.38	2.80	0.4	2.8
TCMT 090202	5.56	2.38	2.50	0.2	2.9
TCMT 090204	5.56	2.38	2.50	0.4	2.8

Grade Selection

MPD85 / MPD02 / MPD05 / MPD10 / MPD25 / MPD302

Choose the grade for the workpiece and operation. Tip layout, edge form and cutting-edge length are specified on the product drawing.

TPGW



11° Clearance



Schematic; Not To Scale

IC: Inscribed Circle t: Thickness d: Hole Diameter r: Corner Radius

LE: PCD Cutting-Edge Length Dimensions In mm

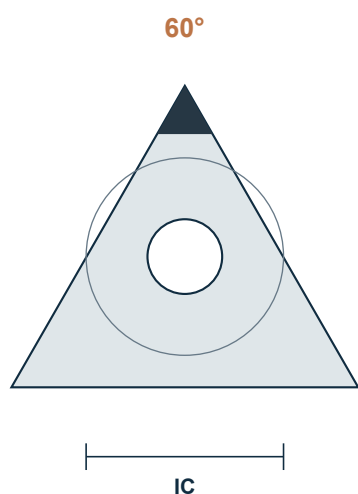
ISO / Model	IC	t	d	r	LE
TPGW 080201	4.76	2.38	2.40	0.1	3.1
TPGW 080202	4.76	2.38	2.40	0.2	3.0
TPGW 080204	4.76	2.38	2.40	0.4	2.9
TPGW 090202	5.56	2.38	2.80	0.2	3.1
TPGW 090204	5.56	2.38	2.80	0.4	2.9
TPGW 110201	6.35	2.38	2.80	0.1	3.1
TPGW 110202	6.35	2.38	2.80	0.2	3.0
TPGW 110204	6.35	2.38	2.80	0.4	2.9
TPGW 110301	6.35	3.18	3.40	0.1	3.1
TPGW 110302	6.35	3.18	3.40	0.2	3.0
TPGW 110304	6.35	3.18	3.40	0.4	2.9
TPGW 110308	6.35	3.18	3.40	0.8	2.7

Grade Selection

MPD85 / MPD02 / MPD05 / MPD10 / MPD25 / MPD302

Choose the grade for the workpiece and operation. Tip layout, edge form and cutting-edge length are specified on the product drawing.

TPGW / Continued



11° Clearance



Schematic; Not To Scale

IC: Inscribed Circle t: Thickness d: Hole Diameter r: Corner Radius

LE: PCD Cutting-Edge Length Dimensions In mm

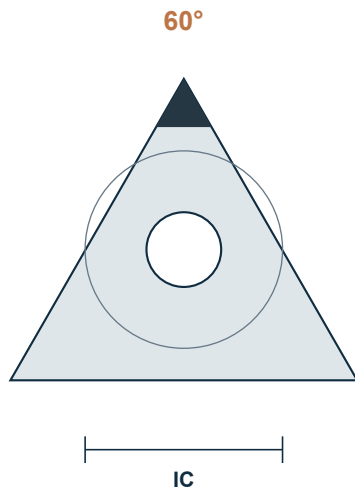
ISO / Model	IC	t	d	r	LE
TPGW 160302	9.525	3.18	4.40	0.2	3.1
TPGW 160304	9.525	3.18	4.40	0.4	2.9
TPGW 160308	9.525	3.18	4.40	0.8	2.7
TPGW 160401	9.525	4.76	4.40	0.1	3.1
TPGW 160402	9.525	4.76	4.40	0.2	3.0
TPGW 160404	9.525	4.76	4.40	0.4	2.9
TPGW 160408	9.525	4.76	4.40	0.8	2.7

Grade Selection

MPD85 / MPD02 / MPD05 / MPD10 / MPD25 / MPD302

Choose the grade for the workpiece and operation. Tip layout, edge form and cutting-edge length are specified on the product drawing.

TPMW



11° Clearance



Schematic; Not To Scale

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LE: PCD Cutting-Edge Length Dimensions In mm

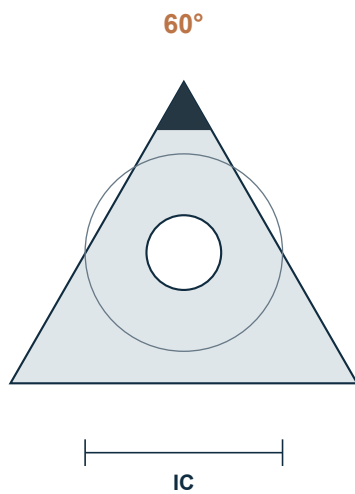
ISO / Model	IC	t	d	r	LE
TPMW 080202	4.76	2.38	2.40	0.2	2.5
TPMW 080204	4.76	2.38	2.40	0.4	2.4
TPMW 110302	6.35	3.18	3.40	0.2	2.5
TPMW 110304	6.35	3.18	3.40	0.4	2.4
TPMW 110308	6.35	3.18	3.40	0.8	2.1
TPMW 160402	9.525	4.76	4.40	0.2	2.5
TPMW 160404	9.525	4.76	4.40	0.4	2.4
TPMW 160408	9.525	4.76	4.40	0.8	2.1

Grade Selection

MPD85 / MPD02 / MPD05 / MPD10 / MPD25 / MPD302

Choose the grade for the workpiece and operation. Tip layout, edge form and cutting-edge length are specified on the product drawing.

TPMT



11° Clearance



Schematic; Not To Scale

IC: Inscribed Circle t: Thickness d: Hole Diameter r: Corner Radius

LE: PCD Cutting-Edge Length Dimensions In mm

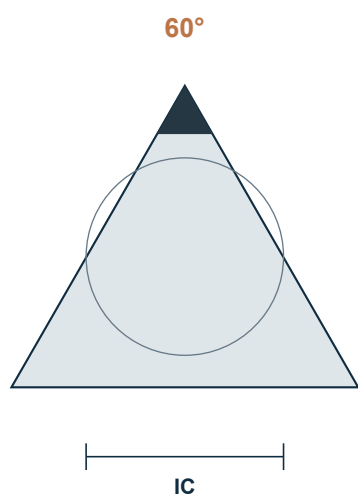
ISO / Model	IC	t	d	r	LE
TPMT 110301	6.35	3.18	3.40	0.1	3.0
TPMT 110302	6.35	3.18	3.40	0.2	2.9
TPMT 110304	6.35	3.18	3.40	0.4	2.8
TPMT 110308	6.35	3.18	3.40	0.8	2.5

Grade Selection

MPD85 / MPD02 / MPD05 / MPD10 / MPD25 / MPD302

Choose the grade for the workpiece and operation. Tip layout, edge form and cutting-edge length are specified on the product drawing.

TPGN



11° Clearance



Schematic; Not To Scale

IC: Inscribed Circle t: Thickness d: Hole Diameter r: Corner Radius

LE: PCD Cutting-Edge Length Dimensions In mm

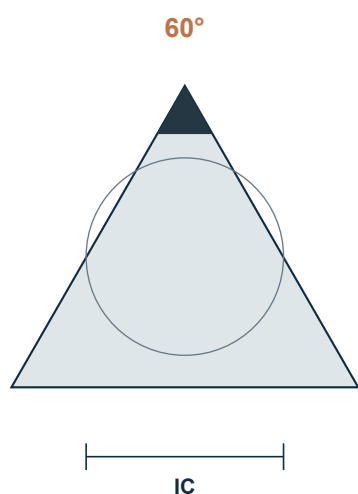
ISO / Model	IC	t	d	r	LE
TPGN 090202	5.56	2.38	-	0.2	3.1
TPGN 090204	5.56	2.38	-	0.4	3.0
TPGN 090208	5.56	2.38	-	0.8	2.7
TPGN 110302	6.35	3.18	-	0.2	3.0
TPGN 110304	6.35	3.18	-	0.4	2.9
TPGN 110308	6.35	3.18	-	0.8	2.7
TPGN 160302	9.525	3.18	-	0.2	3.0
TPGN 160304	9.525	3.18	-	0.4	2.9
TPGN 160308	9.525	3.18	-	0.8	2.7

Grade Selection

MPD85 / MPD02 / MPD05 / MPD10 / MPD25 / MPD302

Choose the grade for the workpiece and operation. Tip layout, edge form and cutting-edge length are specified on the product drawing.

TEGN



20° Clearance



Schematic; Not To Scale

IC: Inscribed Circle t: Thickness d: Hole Diameter r: Corner Radius

LE: PCD Cutting-Edge Length Dimensions In mm

ISO / Model	IC	t	d	r	LE
TEGN 110202	6.35	2.38	-	0.2	3.1
TEGN 110204	6.35	2.38	-	0.4	2.9
TEGN 110302	6.35	3.18	-	0.2	3.1
TEGN 110304	6.35	3.18	-	0.4	2.9
TEGN 110308	6.35	3.18	-	0.8	2.7
TEGN 160302	9.525	3.18	-	0.2	3.0
TEGN 160304	9.525	3.18	-	0.4	2.9

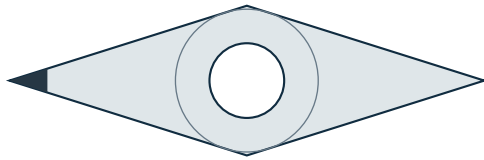
Grade Selection

MPD85 / MPD02 / MPD05 / MPD10 / MPD25 / MPD302

Choose the grade for the workpiece and operation. Tip layout, edge form and cutting-edge length are specified on the product drawing.

VNMA

35°



0° Clearance



Schematic; Not To Scale

IC: Inscribed Circle t: Thickness d: Hole Diameter r: Corner Radius

LE: PCD Cutting-Edge Length Dimensions In mm

ISO / Model	IC	t	d	r	LE
VNMA 160408	9.525	4.76	3.81	0.8	1.9
VNMA 160412	9.525	4.76	3.81	1.2	1.7

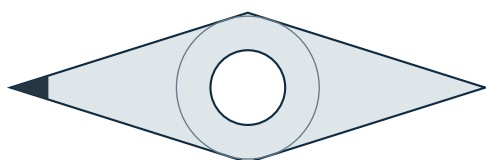
Grade Selection

MPD85 / MPD02 / MPD05 / MPD10 / MPD25 / MPD302

Choose the grade for the workpiece and operation. Tip layout, edge form and cutting-edge length are specified on the product drawing.

VCMW

35°



7° Clearance



Schematic; Not To Scale

IC: Inscribed Circle t: Thickness d: Hole Diameter r: Corner Radius

LE: PCD Cutting-Edge Length Dimensions In mm

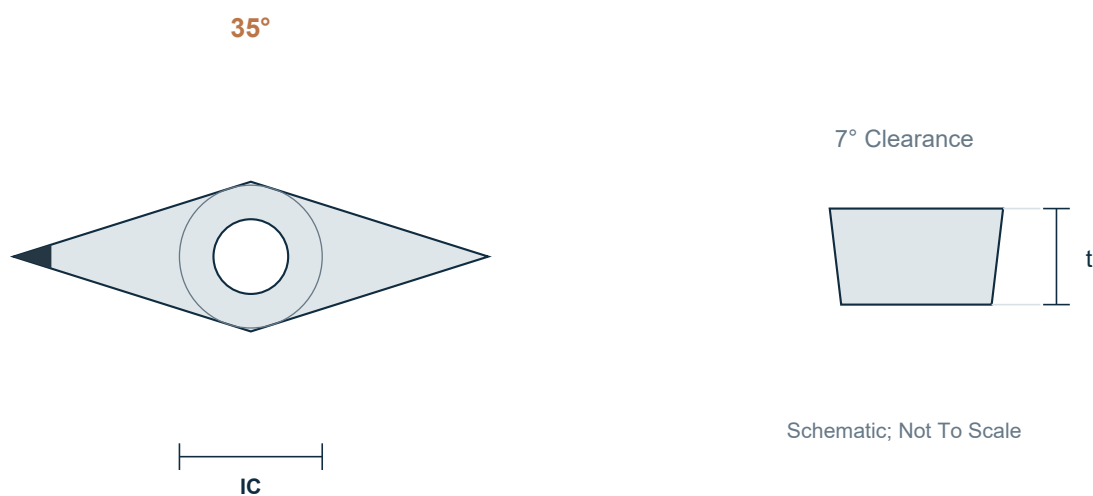
ISO / Model	IC	t	d	r	LE
VCMW 080202	4.76	2.38	2.30	0.2	3.2
VCMW 080204	4.76	2.38	2.30	0.4	2.8
VCMW 110302	6.35	3.18	2.80	0.2	3.2
VCMW 110304	6.35	3.18	2.80	0.4	2.8
VCMW 160402	9.525	4.76	4.40	0.2	3.7
VCMW 160404	9.525	4.76	4.40	0.4	3.3
VCMW 160408	9.525	4.76	4.40	0.8	2.4
VCMW 160412	9.525	4.76	4.40	1.2	2.1

Grade Selection

MPD85 / MPD02 / MPD05 / MPD10 / MPD25 / MPD302

Choose the grade for the workpiece and operation. Tip layout, edge form and cutting-edge length are specified on the product drawing.

VCMT



IC: Inscribed Circle t: Thickness d: Hole Diameter r: Corner Radius

LE: PCD Cutting-Edge Length Dimensions In mm

ISO / Model	IC	t	d	r	LE
VCMT 110301	6.35	3.18	2.80	0.1	3.5
VCMT 110302	6.35	3.18	2.80	0.2	3.4
VCMT 110304	6.35	3.18	2.80	0.4	3.0
VCMT 160404	9.525	4.76	4.40	0.4	6.5
VCMT 160408	9.525	4.76	4.40	0.8	5.6
VCMT 160412	9.525	4.76	4.40	1.2	4.6

Grade Selection

MPD85 / MPD02 / MPD05 / MPD10 / MPD25 / MPD302

Choose the grade for the workpiece and operation. Tip layout, edge form and cutting-edge length are specified on the product drawing.

Tool Setup And Cutting Practice

Clean And Support The Insert

Clean the pocket, shim and clamping parts. Check full seating and use the holder manufacturer's clamping procedure and torque.

Control Rigidity And Runout

Minimize tool overhang, support slender parts and check spindle condition. Poor seating or vibration can damage a sharp PCD edge.

Keep The Cut On The PCD Tip

The working edge must remain within the diamond segment. Avoid engaging an unsupported braze boundary or the carbide body.

Manage Chips And Temperature

Use appropriate coolant delivery for non-ferrous cutting. For graphite and composites, provide effective extraction and avoid abrasive recutting.

Inspect Before Reuse

Check edge chipping, flank wear, built-up edge, tip security and the contact surfaces before reinstalling an insert.

Fabrication And Regrinding

Electrical-Discharge Processing

EDM processability applies to electrically conductive PCD systems. Parameters depend on binder system, grade and equipment. Remove the affected surface layer before final edge finishing.

Diamond Grinding

Use a rigid machine, an appropriate diamond wheel and controlled coolant. Avoid excessive heat and excessive local grinding pressure.

Regrinding Assessment

Measure the remaining PCD tip and inspect its bond. Regrinding changes the usable edge length, corner geometry and potentially the holder relationship.

Final Edge Inspection

Check the edge under magnification for chips, cracks and fabrication damage. Verify the specified nose radius and edge preparation before cutting.

Common Wear And Corrective Actions

Observation	Possible Cause	Action
Progressive flank wear	Abrasive workpiece; unsuitable grade or cutting conditions	Compare wear-focused MPD25 / MPD302; review speed and engagement.
Edge microchipping	Impact, vibration, poor seating or excessive edge load	Improve rigidity and seating; reduce load; evaluate a reinforced edge.
Built-up edge / smearing	Adhesive material, unsuitable speed or edge condition	Improve edge quality and coolant delivery; adjust speed in controlled trials.
Poor finish / chatter	Runout, vibration, nose-radius or feed mismatch	Check setup; reduce overhang; adjust radius and feed.
Tip cracking / detachment	Overload, thermal damage or unsupported engagement	Stop cutting; inspect tip and braze; verify depth and load.
Plastic melting / burrs	Heat generation, rubbing or a blunt edge	Restore sharpness; reduce rubbing and manage heat.
Composite fiber damage	Unsuitable edge geometry or worn edge	Review fiber direction, support, edge sharpness and process conditions.

Inspect failed edges before selecting a correction. Wear appearance alone may not identify the root cause.

Ordering Checklist

Item	Information To Supply
Insert	ISO / model designation and controlled drawing
PCD grade	MPD85 / MPD02 / MPD05 / MPD10 / MPD25 / MPD302
Tip configuration	Number of working corners, PCD segment layout and usable edge length
Edge	Nose radius, hone / chamfer, edge finish and chip-control requirement
Workpiece	Alloy / material, hardness, silicon / reinforcement content and condition
Operation	Turning / facing / boring / profiling / thread turning; cut continuity
Conditions	vc, f, ap, coolant, holder, overhang and machine constraints
Quality target	Finish, dimensional tolerance, burr / fiber requirements and life target
Quantity	Order quantity, sample trial requirement and delivery expectations

Send the workpiece details and insert drawing to support@hmcbtn.com for application review.



PCD

GRADE SERIES

MPD85 / MPD02 / MPD05

MPD10 / MPD25 / MPD302

Conventional Polycrystalline Diamond Turning Inserts

Zhengzhou Huamin Superhard Materials Co.,Ltd.

WEBSITE <https://hmcbn.com>

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EMAIL support@hmcbn.com