TOMEI DIAMOND

Products Guide

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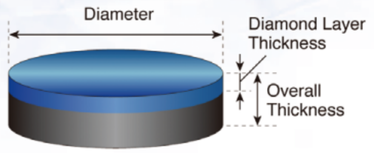
2016.10
PCD

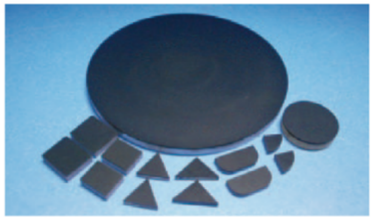
TOMEI DIAMOND

PCD

Products Guide | POLY CRYSTALLINE DIAMOND

TOMEI POLY CRYSTALLINE DIAMOND (PCD) PRODUCTS



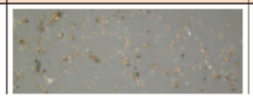
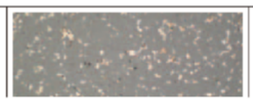
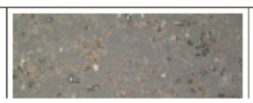
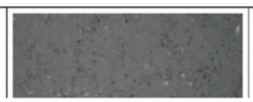
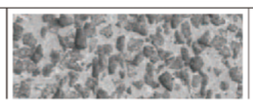


Our regular PCD products are shipped with dimensions below.
As also available on demand, contact us for a cut shape or a product of dimensions other than shown here.
The suffix "M" of a product code refers to the mirror finish with which regular products are shipped. They are also available without the mirror finish on demand.

■Dimensions - Regular PCD Products

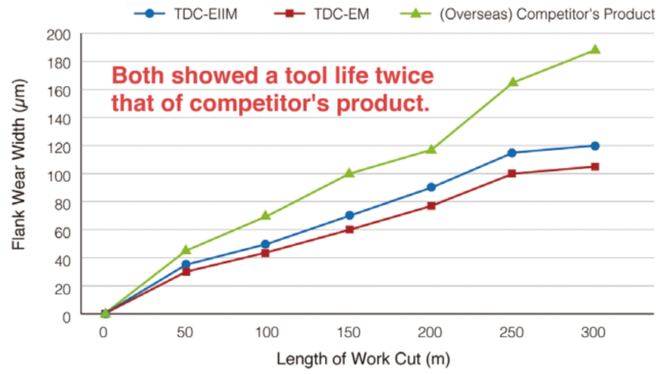
Diameter [mm]	Avg. Diamond Layer Thickness [mm]	Overall Thickness [mm]
52	0.5	1.6
		2.0
60		3.2

Note: The diameter of a PCD does not refer to that of diamond layer but of carbide alloy substrate, so a 60mm diam. PCD has a substrate 60 mm across, for example.

Designation	Microstructure	Avg. Diamond Particle Size (μm)	Features
TDC-EM		36+16	PCD product with highest wear resistance in all grades. Suitable for rough machining of non-ferrous alloys, aluminum metal and alloys including Al-Si.
TDC-E2M		20	A grade of improved workability and minimum wear resistance drop from TDC-EM by means of increased diamond concentration.
TDC-HM		10	A grade high in wear resistance due to close diamond particles packing. Suitable for machining of various materials including Al metals and alloys, Al-Si, Cu alloy, carbon, FRP, hardened rubber, solid and laminated wood, etc.
TDC-SM		7	A grade of smaller diamond particles than TDC-HM. Retaining wear resistance, improved in workability.
TDC-GM		3	A grade much improved in both toughness and workability.
TDC-98F2M		1+(3)	A mixed product of sintered,1μm size diamond.
TDC-98F3M		1+(3)	A superor grade to TDC-98F2M with an increased diamond concentration. Best in wear resistance in all grades with 1 μm diamond. Suitable for precision turning of various materials including Al alloys, Cu alloys, and plastics.
TDC-FM		1	A grade of submicron diamond firmly sintered. Good in workability and capable of forming a very sharp edge. Suitable for precision turning of various materials including Al alloys, Cu alloys, and plastics.
TDC-VM		0.6	A grade of sintered, hyper-precision sorted 0.6 μm diamond. Suitable for high Si alloy over JIS ADC12 and hard particle containing resin.
TDC-WC series		3～16	A composite product of sintered, minute to medium size diamond and carbide alloy, distributed optimally for the particular uses. Good in both wear resistance and workability. Widely useful for making wear parts and jigs.

The cutting performance of coarse particle PCDs: TDC-EM and TDC-EIIM

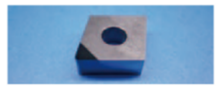
As coarse particle PCD grades used commonly for machining of carbide alloys and carbon materials, TDC-EM and TDC-EIIM were tested for the cutting of carbide alloy and the results were compared with a corresponding product from an overseas competitor.



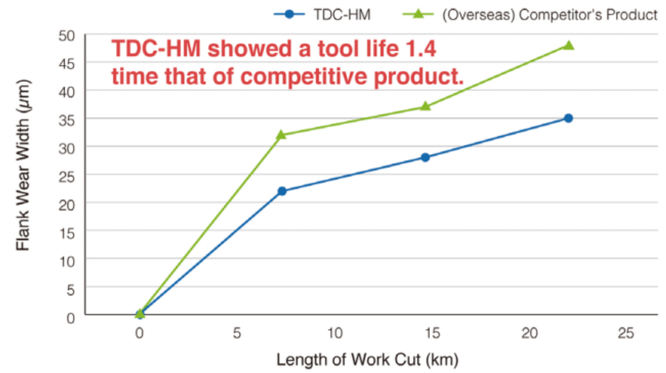
Parameters	
Cutting Velocity Vc	15 m/min.
Depth of Cut ap	0.25 mm
Feed f	0.0344 mm/rev.
Cutting Time Tc	20 min.
Length of Work Cut L	300 m
Tip Type	CNGA120408
Work Material	WC-20wt%Co
Cutting Mode	Dry

The cutting performance of medium-size particle PCD: TDC-HM

As a medium-size particle PCD abrasive used generally for machining of non- ferrous metal and carbon materials, TDC-HM was tested for the cutting of 15wt%Si-Al alloy and the results were compared with a corresponding product from an overseas competitor.



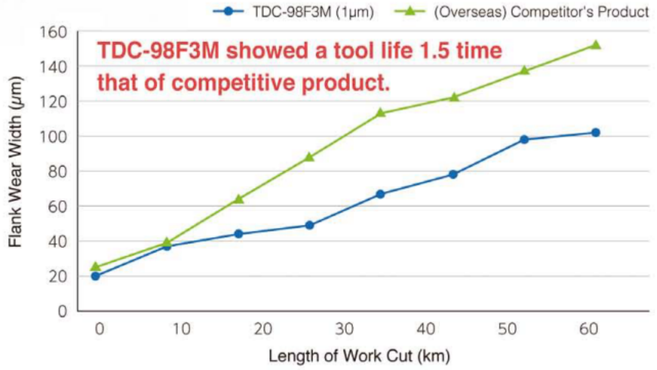
TDC-HM test tip
(Type CNGA120408)



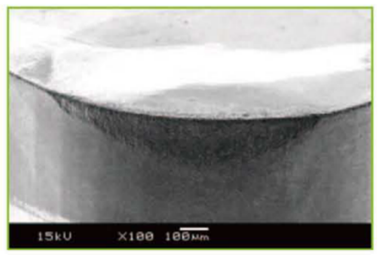
Parameters	
Cutting Velocity Vc	800 m/min.
Depth of Cut ap	0.5 mm
Feed f	0.12 mm/rev.
Cutting Time Tc	27 min.
Length of Work Cut L	21.6 km
Tip Type	CNGA120408
Work Material	15wt%Si-Al
Cutting Mode	Wet

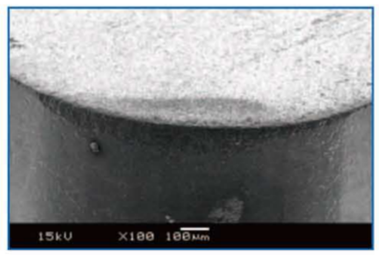
The cutting performance of minute particle PCD: TDC-98F3M

As a minute particle PCD grade specifically adapted for the machining of Al alloy and other non-ferrous metallic materials and resin materials, TDC-98F3M was tested for the cutting of 15wt%Si-Al alloy and the results were compared with a corresponding product from an overseas competitor.



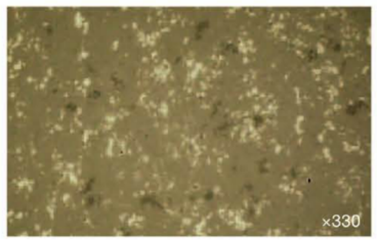
Parameters	
Cutting Velocity Vc	800 m/min.
Depth of Cut ap	0.5 mm
Feed f	0.12 mm/rev.
Cutting Time Tc	63 min.
Length of Work Cut L	50.4 km
Tip Type	CNMX120408
Work Material	15wt%Si-Al
Cutting Mode	Wet



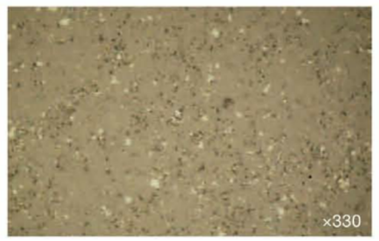


Comparison of Microstructure (Optical microscopy, x 66 and x 330)

TDC-98F2M



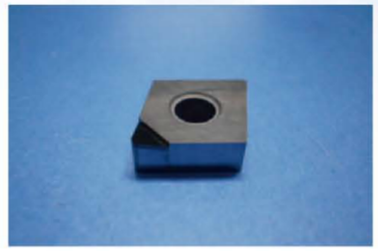
TDC-98F3M



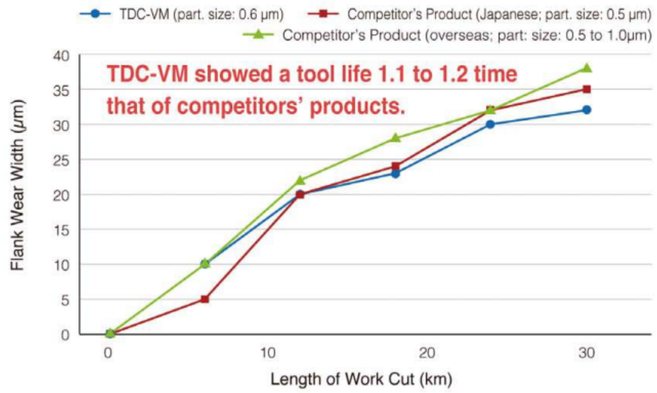
For 98F3M, significant reduction in binder metal area is seen relative to 98F2M, resulting in increased density of immediate diamond-on-diamond bond

The cutting performance of very minute particle PCD: TDC-VM

As a very minute particle PCD grade specifically adapted for the machining of Al alloy with higher Si than ADC12, resin containing hard particles, etc., the new grade TDC-VM was tested for the cutting of 15wt%Si-Al alloy and the results were compared with corresponding products from Japanese and overseas competitors.



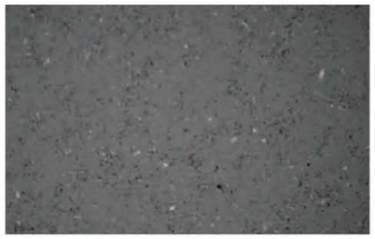
TDC-VM test tip (Type CNMX120408)



Parameters	
Cutting Velocity Vc	800 m/min.
Depth of Cut ap	0.5 mm
Feed f	0.12 mm/rev.
Length of Work Cut L	28.8 km
Tip Type	CNMX120408
Work Material	15wt%Si-Al
Cutting Mode	Wet

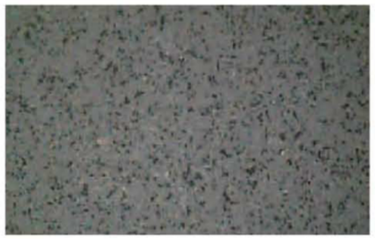
Comparison of Microstructure (Optical microscopy, x 330)

TDC-VM

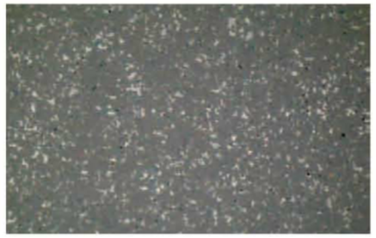


For TDC-VM shows significant reduction in binder metal area than the competitors' products, resulting in a much more closely bonded structure.

Competitor's Product (Japanese)

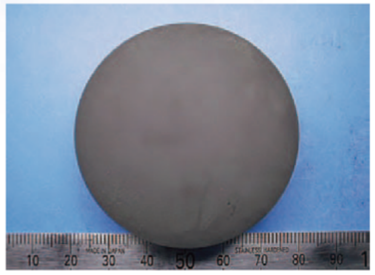


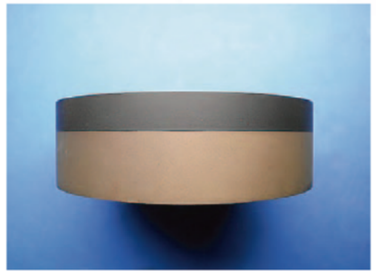
Competitor's Product (overseas)

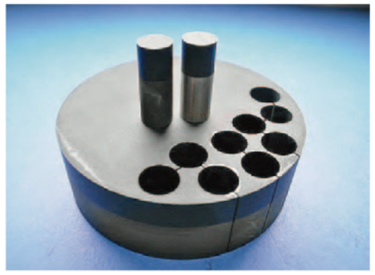


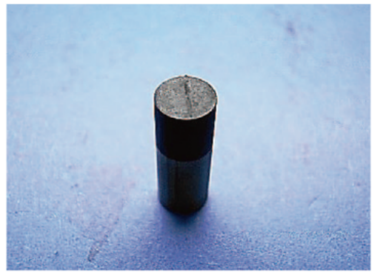
Specialty PCD products

Specialty PCD products are produced on Customer's demand with a thickness, increased or anyway other than standardized.









Diamond Layer Thickness (mm)	Overall Thickness (mm)
1-4	8-20

The specialty products are produced on your demand, so please contact us for the diamond particle size and PCD dimensions you would like for your particular uses.

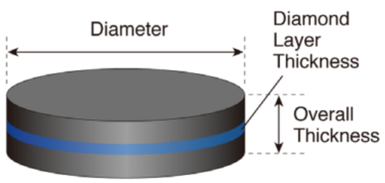
Examples

TDC-H PCD specialty product: work rest

Non-magnetic PCD nozzle

TDC-G PCD drill

TDC-SA



TDC-SA is a cylindrical composite material with the central PCD layer and a layer of carbide alloy on each side sintered together by a special technique of our own development. They are suitable for the manufacture of cutting tools, wear resistant parts, etc.

■**Dimensions**

Avg. diamond particle size (μm)	Diameter (mm)	Diamond Layer Thickness (mm)	Overall Thickness (mm)
16	52	0.7	6

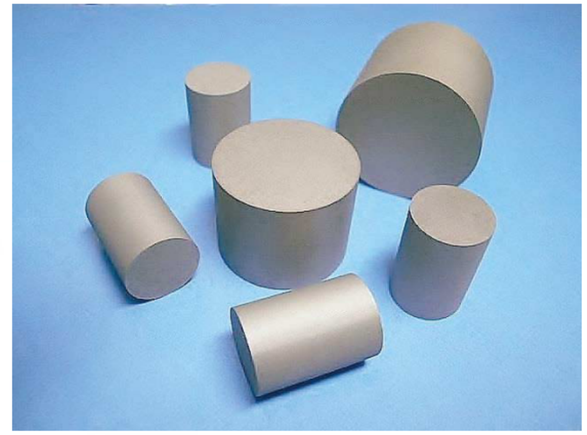
* Produced on customer's demand

IDD

IDD is PCD type of carbide alloy is dispersed
It contains 20% to 30% of the diamond.
Since C is not repuired of the backing, which can only diamond layer.
Up to a maximum of 20mm it can be manufactured.
Be prepared in blanks ϕ75.20t, it will be sold to inspection.

Diamond Content [Vol%]	Overall Thickness [mm]
20~60	20

So please contact us for the diamond particle size and diamond content you would like for your particular uses.



Other PCD products