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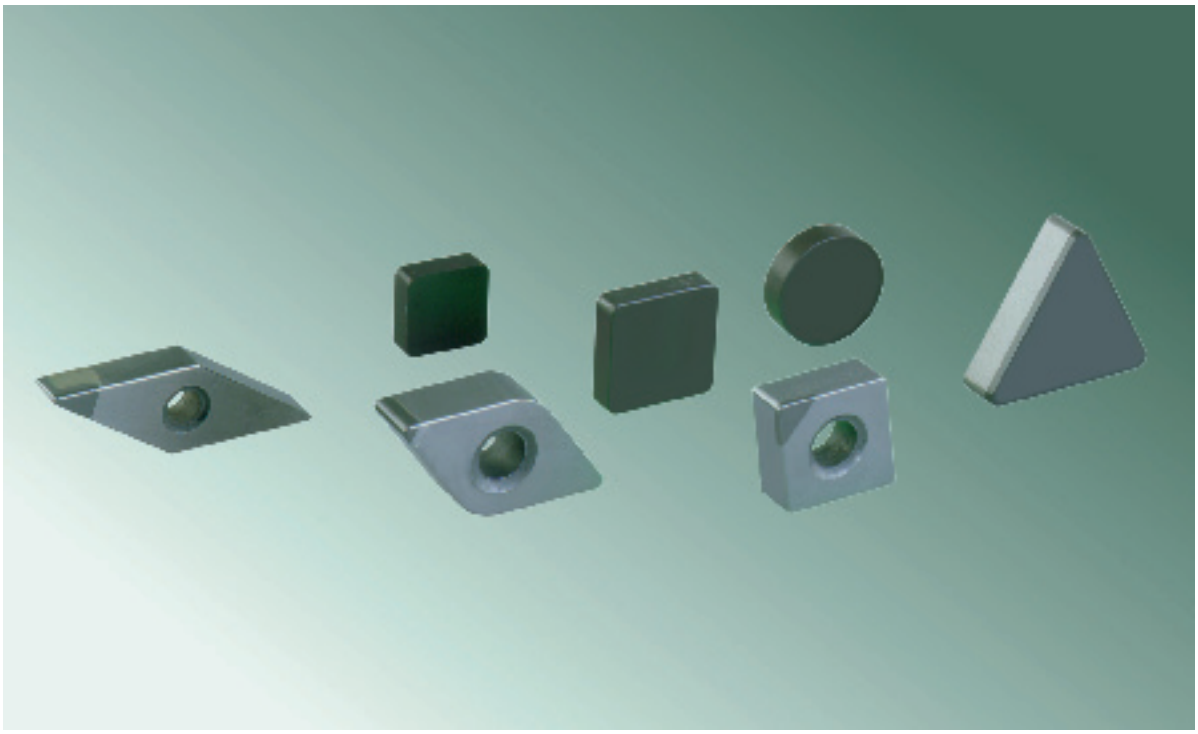

PCBN inserts

PCBN inserts

for hardturning of :

case and induction hardened steels
tool and die steels
bearing steels
and many cast irons

TECHNODIAMANT

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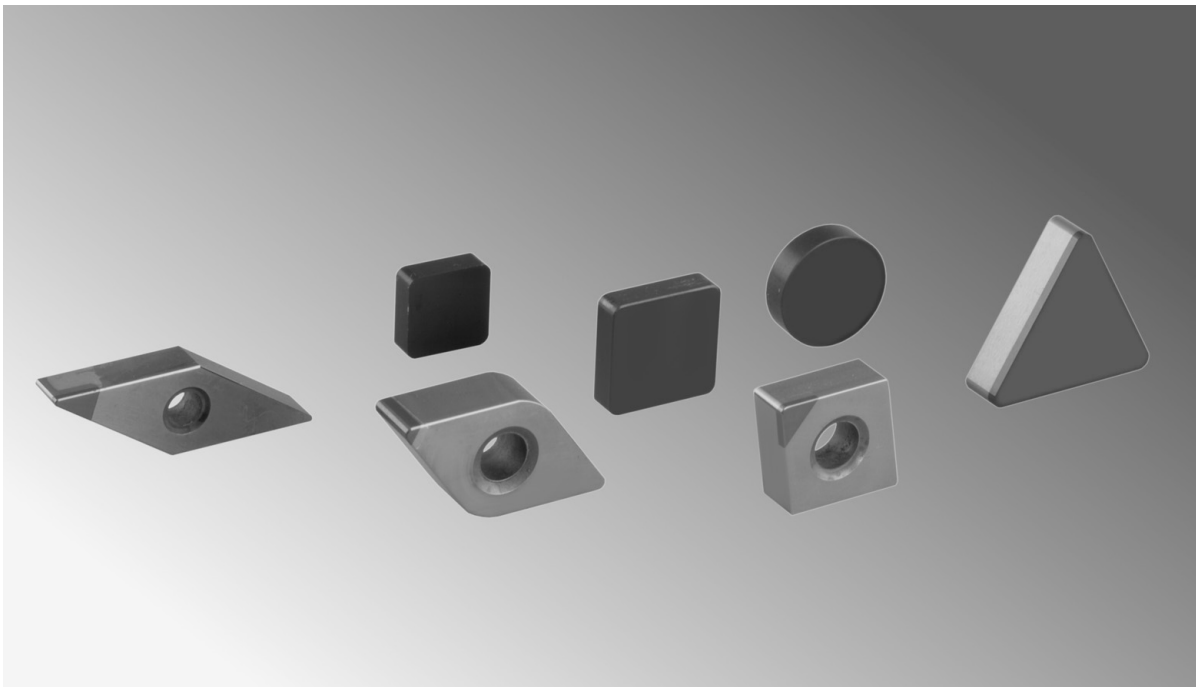

PCBN inserts

Contents:

What is polycrystalline cubic boron nitride ?

Diamond, cubic carbon, is the hardest, most abrasive-resistant material known to man. It is therefore an ideal tool material. In the presence of extreme heat and a catalyst, (iron, nickel or cobalt), diamond transforms to the hexagonal carbon form, graphite. This is why ferrous materials are not generally machined with diamond.

The second hardest material, Cubic Boron Nitride (CBN), is created by man, using temperatures and pressures similar to those used for diamond synthesis, and does not have this inherent weakness when it comes to the machining of ferrous materials.

While CBN will machine soft irons and steels with ease, the relatively high cost of CBN tools makes them less cost-effective than conventional tool materials which will also perform well on soft materials. Used in the correct manner, however, CBN can offer cost-effective rapid stock removal and finishing of hardened steels and certain softer ferrous materials.

Technodiamant offers two types of CBN material:

1. TDA-H- has a high CBN content and is designed for heavy machining applications, where high stock removal rates provide an attractive alternative to conventional techniques.

2. TDA-M- has a reduced CBN content and is designed for finishing and semi-finishing applications where grinding with conventional abrasives proves difficult or time consuming.

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Stock removal with TDA-Multiblock

Applications

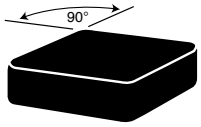
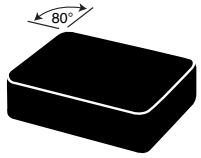
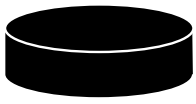
* Chill cast irons
* Fully hardened cold-work tool steels
* High speed steels (continous cutting)
* Martensitic cast irons Ni-hard-high chrome irons
* Martensitic stainless steels
* Fully pearlitic grey cast iron
* Cobalt and nickel based hard-facing alloys

TDA-Multiblock - Typical machining parameters

	Workpiece material	Hardness approx	Surface speed (m/min)	Typical depth of cut (mm)	Feed (mm/rev)
TURNING	Ni-HARD	58 HRC	50 - 100	2.5	0.35
	White/chill cast iron	55 HRC	60 - 100	2.0	0.4
	High speed steel	62 HRC	60 - 120	2.0	0.2
	Cold work tool steel	60 HRC	80	2.0	0.25
	Cr/Ni irons	58 HRC	55	2.0	0.3
	Sintered iron	200 HB	500 - 1000	0.5 - 2.0	0.1 - 0.4
	Grey cast iron	200 HB	300	0.5	0.1
	Hard Facing alloys Cobalt based Nickel based	 from 35 HRC from 35 HRC	 200 - 250 120 - 150	 1.0 1.0	 0.25 0.2
					(mm/tooth)
MILLING	Meehanite	55 HRC	300	0.5	0.5
	Ni-HARD	58 HRC	200	1.0	0.25
	Cold work tool steel	60 HCR	180	1.0	0.2
	Nickel based hard facing alloys	from 35 HRC	220	0.5	0.3

Product range of solid TDA-Multiblock inserts for top clamp tool holders

Edge condition: F = Unchamfered
T = Chamfered

Product no.	Inscribed circle (mm)	Thickness (mm)	Radius (mm)	
SNMN 090308* SNMN 090312* SNMN 090316* SNMN 120308* SNMN 120312* SNMN 120316*	9.52 9.52 9.52 12.70 12.70 12.70	3.18 3.18 3.18 3.18 3.18 3.18	0.8 1.2 1.6 0.8 1.2 1.6	
CNMN 090308* CNMN 090312* CNMN 090316*	9.52 9.52 9.52	3.18 3.18 3.18	0.8 1.2 1.6	
TNMN 110304* TNMN 110308* TNMN 110312* TNMN 110316* TNMN 224416*	6.35 6.35 6.35 6.35 11.55	3.18 3.18 3.18 3.18 4.76	0.4 0.8 1.2 1.6 1.6	
RNMN 090300* RNMN 120400* RNMN 250600* RNMN 380700*	9.52 12.70 25.40 38.10	3.18 3.18 6.35 7.94	- - - -	

* enter cutting edge condition

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TDA-M and TDA-H

Applications: for finish-machining of hardened steels and certain softer ferrous materials

* Surface and through hardened steels
* High speed steels
* Bearing steels
* Die steels
* Cold-work tool steels
* Grey or chilled cast iron

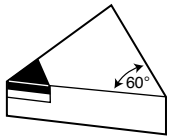
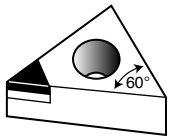
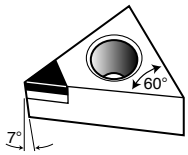
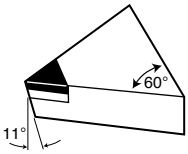
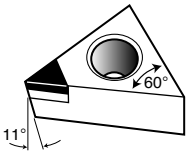
TDA-M - Typical machining parameters

Workpiece material	Approx. Hardness	Speed (m/min)	Typical depth of cut (mm)	Feed (mm/rev)
Cold work tool steels	60 HRC	100 - 200	0.01 - 1.0	0.05 - 0.2
High speed steels	62 HRC	80 - 120	0.01 - 1.0	0.06 - 0.2
Bearing steels	60 HRC	80 - 180	0.01 - 1.0	0.05 - 0.2
Hot work die steels	50 HRC	150 - 250	0.01 - 1.0	0.06 - 0.2
Surface hardened parts	62 HRC	80 - 250	0.01 - 1.0	0.02 - 0.2

TDA-H - Typical machining parameters

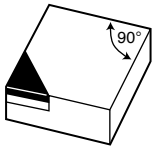
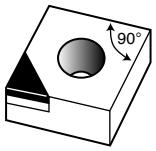
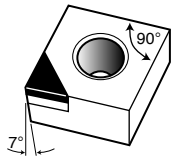
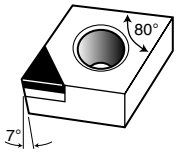
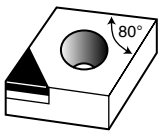
	Workpiece material	Hardness approx.	Surface speed (m/min)	Typical depth (mm)	Feed (mm/rev)
TURNING	Ni-HARD	58 HRC	50 - 100	2.5	0.35
	White/chill cast iron	55 HRC	60 - 100	2.0	0.4
	High speed steel	62 HRC	60 - 120	2.0	0.2
	Cold work tool steel	60 HRC	80	2.0	0.25
	Cr/Ni irons	58 HRC	55	2.0	0.3
	Sintered iron	200 HB	500 - 1000	0.5 - 2.0	0.1 - 0.4
	Grey cast iron	200 HB	300	0.5	0.1
	Hard facing alloys Cobalt based Nickel based	 from 35 HRC from 35 HRC	 200 - 250 120 - 150	 1.0 1.0	 0.25 0.2
					(mm/tooth)
MILLING	Meehanite	55 HRC	300	0.5	0.5
	Ni-HARD	58 HRC	200	1.0	0.25
	Cold work tool steel	60 HCR	180	1.0	0.2
	Nickel based hard facing alloys	from 35 HRC	220	0.5	0.3

TDA-M and TDA-H triangle
Standard 4 mm edge regrindable cutting tool inserts
Edge condition: F = Unchamfered
T = Chamfered

Product no.	Inscribed circle (mm)	Thickness (mm)	Radius (mm)	
TNUN 1103** TNUN 1603** TNUN 1604**	6.35 9.52 9.52	3.18 3.18 4.76	0.4 - 1.2 0.4 - 1.2 0.4 - 0.6	
TNMA 1103** TNMA 1604** TNMA 1604**	6.35 9.52 9.52	3.18 4.76 4.76	0.4 - 1.2 0.4 - 1.6 0.4 - 1.6	
TCMW 1102** TCMW 16T3**	6.35 9.52	2.38 3.96	0.4 - 0.8 0.4 -1.2	
TPUN 1103**	6.35	3.18	0.4 - 1.6	
TPMW 0702**	4.76	2.38	0.2 - 0.4	

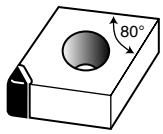
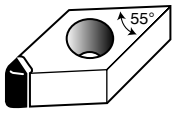
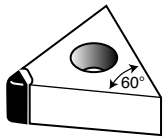
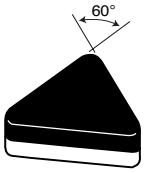
** enter radius and cutting edge condition

TDA-M and TDA-H squares and rhombus
Standard 4 mm edge regrindable cutting tool inserts
Edge condition: F = Unchamfered
T = Chamfered

Product no.	Inscribed circle (mm)	Thickness (mm)	Radius (mm)	
SNUN 0903** SNUN 1204**	9.52 12.70	3.18 4.76	0.8 - 1.2 0.8 - 1.6	
SNMA 0903** SNMA 1204**	9.52 12.70	3.18 4.76	0.4 - 1.2 0.8 - 1.6	
SCMW 1204**	12.70	4.76	0.8- 1.6	
CCMW 0602** CCMW 09T3** CCMW 1204**	6.35 9.52 12.70	2.38 3.96 4.76	0.2 - 0.4 0.4 - 0.8 0.4 - 1.6	
CNMA 1204** CNMA 0903**	12.70 9.52	4.76 3.18	0.4 - 1.6 0.4 - 1.2	

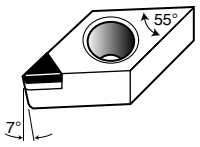
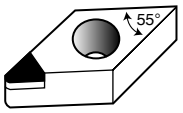
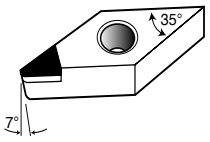
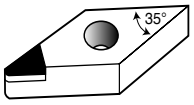
** enter radius and cutting edge condition

TDA-M and TDA-H
Disposable cutting tool inserts
Edge condition: F = Unchamfered
T = Chamfered

Product no.	Inscribed circle (mm)	Thickness (mm)	Radius (mm)	
CNMA 1204** DE	9.52	3.18	0.8 - 1.2	
DNMA1506**DE	9.52	3.18	0.4 - 1.2	
TNMA 1604** DE	9.52	4.76	0.4 - 1.2	
TNMN 0903** TBMN 0903** TNMN 0601** TBMN 0601** TPMN 0601**	5.56 5.56 3.97 3.97 3.97	3.18 2.38 1.60 1.60 1.60	0.4 - 1.2 0.4 - 0.8 0.4 - 0.8 0.4 - 0.8 0.4 - 0.8	

** enter radius and cutting edge condition

TDA-M and TDA-H inserts
Edge condition: F = Unchamfered
T = Chamfered

Product no.	Inscribed circle (mm)	Thickness (mm)	Radius (mm)	
DCMW 0702** DCMW 11T3 ** DCMW 1504**	6.35 9.52 12.70	2.38 3.86 4.76	0.2 - 0.4 0.4 - 1.2 0.4 - 1.6	
DNMA 1504** DNMA 1506**	12.70 12.70	4.76 6.35	0.4 - 1.6 0.4 - 1.6	
VCMW 1604**	9.52	4.76	0.4 - 1.2	
VNMA 1604 **	9.52	4.76	0.4 - 1.2	

** enter radius and cutting edge condition

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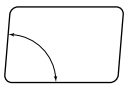
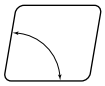
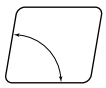
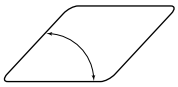
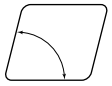
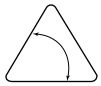
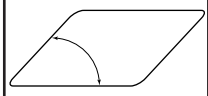
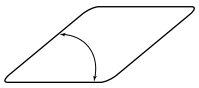
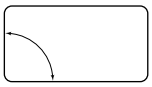
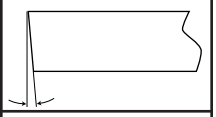
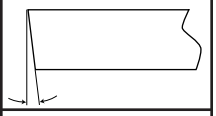
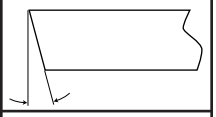
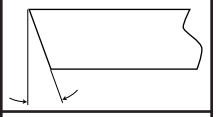
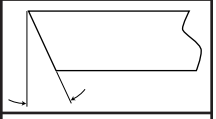
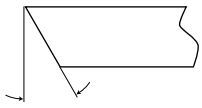
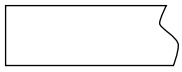
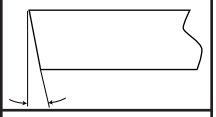
ISO- Code Key for inserts

1 Insert shape

A	85°		M	86°	
B	82°		O	135°	
C	80°		P	108°	
D	55°		R		
E	75°		S	90°	
H	120°		T	60°	
K	55°		V	35°	
L	90°		W	80°	

2 Insert clearance angle

A	3°	
B	5°	
C	7°	
D	15°	
E	20°	
F	25°	
N	0°	
P	11°	
O		SPECIAL DEFINITION

3 Tolerances

M - For other inserts: distance from inscribed circle to cutting tip

D - Diameter
S - Insert thickness
M - For triangles: Insert height from one side to opposite cutting tip

I C d	S ± mm		M ± mm		D ± mm	
	Class M	Class U	Class M	Class U	Class M	Class U
3.97	0.13	0.13	0.08	0.13	0.05	0.08
4.76	0.13	0.13	0.08	0.13	0.05	0.08
5.56	0.13	0.13	0.08	0.13	0.05	0.08
6.35	0.13	0.13	0.08	0.13	0.05	0.08
9.52	0.13	0.13	0.08	0.13	0.05	0.08
12.70	0.13	0.13	0.13	0.20	0.08	0.13
15.88	0.13	0.13	0.15	0.27	0.10	0.18
19.05	0.13	0.13	0.15	0.27	0.10	0.18
25.40	0.13	0.13	0.18	0.38	0.13	0.25
38.10	0.13	0.13	0.18	0.38	0.13	0.25

4 Insert type

A		N	
E		W	

5 Length cutting edge

S				06	09	12	15	19	25	38
R				06	09	12	15	19	25	38
C				06	09	12	15	19	25	38
D				07	11	15				
V					16	22				
T	06	07	09	11	16	22	27	33		
I C d	3.97	4.76	5.56	6.35	9.52	12.7	15.88	19.05	25.40	38.10

6 Insert thickness

Index	01	02	03	T3	04	06	07
Thickness (mm)	1.60	2.38	3.18	3.96	4.26	6.35	7.94

7 Corner radius

	04	08	12	16
Radius (mm)	0.4	0.8	1.2	1.6

8 Cutting edge type

F	Unchamfered	T	Chamfered

Example							
1	2	3	4	5	6	7	8
S	N	M	N	12	03	08	F