

C B N H A R D T U R N I N G

J & M

DIAMOND TOOL, INC.

Hard Turning Solutions

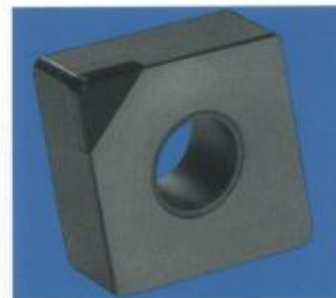
Hard turning problems find easy solutions with CBN inserts from J&M. We offer a wide selection of grades, shapes and sizes.

If you have special needs, our technical service department will provide further solutions, and we can manufacture to your specifications.

Cubic Boron Nitride

Cubic boron nitride (CBN) is an artificially synthesized material exceeded in hardness only by diamond. Unlike diamond, CBN is stable under conditions of high temperature (up to 1000°C) normally created when machining hardened ferrous or superalloy materials. Discs are available up to 55mm diameter and in different grades for different applications.

CBN tools permit metal cutting at feeds and speeds much higher than with conventional cutting tool materials. CBN tools also turn, bore and face hard materials, which otherwise can be formed only by grinding. Because CBN tools maintain a sharp cutting edge, surface finishes are excellent, close tolerances are easy to maintain, and dramatic productivity increases can be expected.



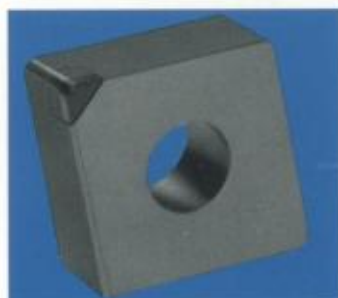
Standards

A wide assortment of shapes and grades.



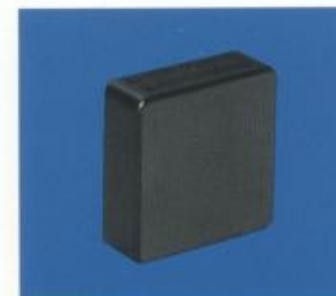
Large Tips

For deeper cuts.



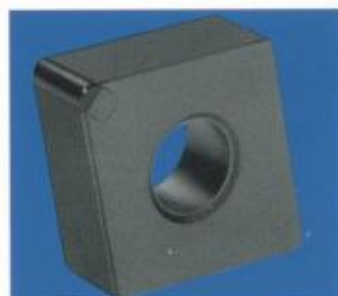
Mini Tips

Inexpensive. In many shapes and grades, for shallow cuts.



Solid CBN

Cutting edges on both sides. Indexable.



Flip Tips

Cost-effective. Two cutting edges for finish cuts. Flip Tip is a trademark of J&M Diamond Tool, Inc.



Full Face

Cutting edges. Full top surface. Indexable.

Working With CBN

Materials Recommended For Cutting With CBN

Alloy Steel (45-68 RC)	Ni Hard	Die steel (45-68 RC)	Rene
Carbon tool steel (45-68 RC)	Forged steel	Stellite	Ductile iron
Moly Chrome Steel Rolls	Nodular iron	Colmonoy	Incoloy
High speed steel (45-68 RC)	Grey iron	Waspoly	Monel
Chilled cast iron	Inconel 600	Mechanite iron	

CBN Grades Available

J&M Grade	Application
1000	Most cast iron
2500	Continuous cutting hardened steel and slight interrupted cuts
3000	Hardened steel (severely interrupted cut)
5000	Nodular iron — Ductile Iron
6000	Super alloy, Ni/Co base alloys
8200	Continuous cutting hardened steel and slight interrupted cuts
	<i>Other special grades available.</i>

Edge Preps

A standard edge prep is put on all inserts.

Special edge prep is available for special applications.

Grade	Angle	Width	
Grade 1000	15° K Land	.002 - .004"	No hone
Grade 2500	25° K Land	.004 - .006"	Light hone
Grade 3000	25° K Land	.004 - .006"	No hone
Grade 5000	15° K Land	.004 - .006"	No hone
Grade 6000	20° K Land	.004 - .006"	Light hone
Grade 8200	25° K Land	.004 - .006"	Light hone

Recommended Use Of CBN Grades

Material	CBN Grades
Alloy steels (45-68 RC)	2500, 3000, 8200
Carbon tool steels (45-68 RC)	2500, 3000, 8200
Die steel (45-68 RC)	2500, 3000, 8200
High speed steel (45-68 RC)	2500, 3000, 8200
Chilled cast iron	1000
Nodular cast iron	5000
Ni Hard	1000, 6000
Forged steel	2500, 8200
Moly chrome steel rolls	6000
Inconel 600	6000
Rene	6000
Incoloy	6000
Monel	6000
Stellite	6000
Colmonoy	6000
Waspoly	6000
Nodular iron	5000
Ductile iron	5000
Grey iron	5000

Recommended Speeds and Feeds

Material	Speed (SFM)	Feed Rate (IPR)	Depth of Cut (inches)
Carbon Steel	200 - 500	.008 Max	.020 Max
Bearing Steel	200 - 500	.008 Max	.020 Max
Alloy Steel	200 - 500	.008 Max	.020 Max
Die Steel	160 - 350	.008 Max	.020 Max
Tool Steel	160 - 350	.008 Max	.020 Max
High Tensile Cast Iron	200 - 500	.060 Max	.020 Max
Chilled Cast Iron	130 - 260	.032 Max	.020 Max
Grey Cast Iron	2000 - 4000	.020 Max	.020 Max
Powdered Metal	500 - 650	.016 Max	.020 Max
Inconel	500 - 650	.006 Max	.020 Max
Rene 42	500 - 650	.006 Max	.020 Max
Rene 77	450 - 550	.006 Max	.020 Max
Incoloy	750 - 900	.006 Max	.020 Max
Monel	550 - 650	.006 Max	.020 Max
Stellite	550 - 650	.006 Max	.020 Max
Colmonoy	550 - 650	.003 Max	.020 Max
Waspoly	550 - 650	.003 Max	.020 Max

Mini Tips & Double Mini Tips



CCMW



Insert	I.C.	Dimensions	
		T	R
CCMW 21.51	.250	.094	.016
CCMW 21.52	.250	.094	.031
CCMW 32.51	.375	.156	.016
CCMW 32.52	.375	.156	.031

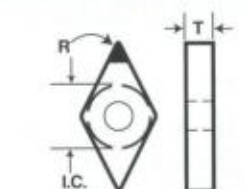
CNMA



Insert	I.C.	Dimensions	
		T	R
CNMA 431	.500	.187	.016
CNMA 432	.500	.187	.031

Available in double mini tip.

DNMA



Insert	I.C.	Dimensions	
		T	R
DNMA 431	.500	.187	.016
DNMA 432	.500	.187	.031

Available in double mini tip.

SNMA



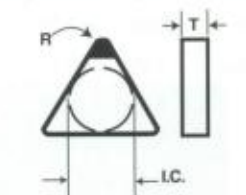
Insert	I.C.	Dimensions	
		T	R
SNMA 431	.500	.187	.016
SNMA 432	.500	.187	.031

TNMA



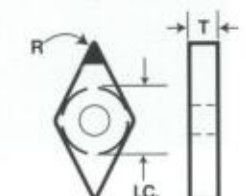
Insert	I.C.	Dimensions	
		T	R
TNMA 321	.375	.125	.016
TNMA 322	.375	.125	.031
TNMA 331	.375	.187	.016
TNMA 332	.375	.187	.031
TNMA 431	.500	.187	.016
TNMA 432	.500	.187	.031

TPG



Insert	I.C.	Dimensions	
		T	R
TPG 221	.250	.125	.016
TPG 222	.250	.125	.031
TPG 321	.375	.125	.016
TPG 322	.375	.125	.031

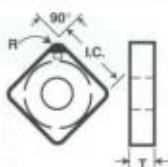
VNMA



Insert	I.C.	Dimensions	
		T	R
VNMA 331	.375	.187	.016
VNMA 332	.375	.187	.031

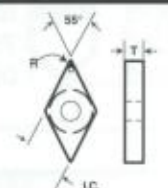
Flip Tips®

CNMA



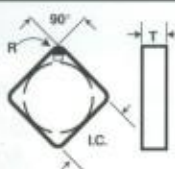
Insert	Dimensions		
	I.C.	T	R
CNMA 431	.500	.187	.016
CNMA 432	.500	.187	.031
CNMA 433	.500	.187	.046

DNMA



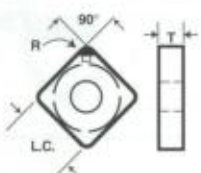
Insert	Dimensions		
	I.C.	T	R
DNMA 431	.500	.187	.016
DNMA 432	.500	.187	.031
DNMA 433	.500	.187	.046

SNG



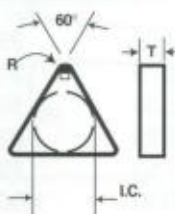
Insert	Dimensions		
	I.C.	T	R
SNG 322	.375	.125	.031
SNG 432	.500	.187	.031

SNMA



Insert	Dimensions		
	I.C.	T	R
SNMA 322	.375	.125	.031
SNMA 432	.500	.187	.031
SNMA 433	.500	.187	.046

TNG



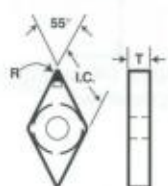
Insert	Dimensions		
	I.C.	T	R
TNG 221	.250	.125	.016
TNG 222	.250	.125	.031
TNG 321	.375	.125	.016
TNG 322	.375	.125	.031
TNG 332	.375	.187	.031
TNG 431	.500	.187	.016
TNG 432	.500	.187	.031
TNG 433	.500	.187	.046

TNMA



Insert	Dimensions		
	I.C.	T	R
TNMA 221	.250	.125	.016
TNMA 222	.250	.125	.031
TNMA 322	.375	.125	.031
TNMA 331	.375	.187	.016
TNMA 332	.375	.187	.031
TNMA 431	.500	.187	.016
TNMA 432	.500	.187	.031
TNMA 433	.500	.187	.046

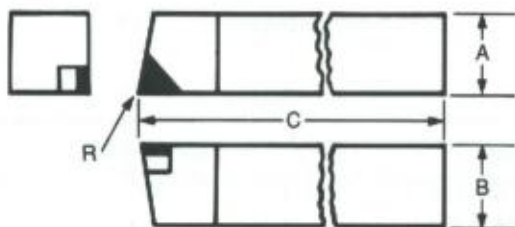
VNMA



Insert	Dimensions		
	I.C.	T	R
VNMA 331	.375	.187	.016
VNMA 332	.375	.187	.031
VNMA 432	.500	.187	.031

Turning Tools

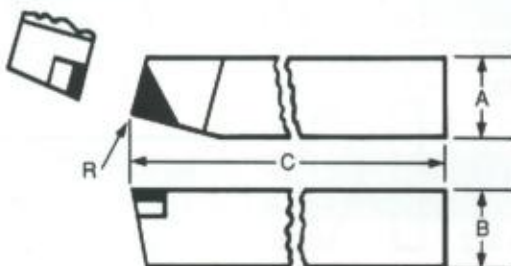
STYLE A



Right hand tool shown.

Tool number	A	B	C	R
AR & AL 4	.250	.250	2.000	.016
AR & AL 6	.375	.375	2.500	.016
AR & AL 8	.500	.500	3.500	.031
AR & AL 10	.625	.625	4.000	.031
AR & AL 12	.750	.750	4.500	.031
AR & AL 16	1.000	1.000	7.000	.031

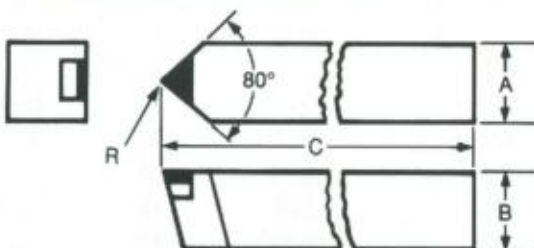
STYLE B



Right hand tool shown.

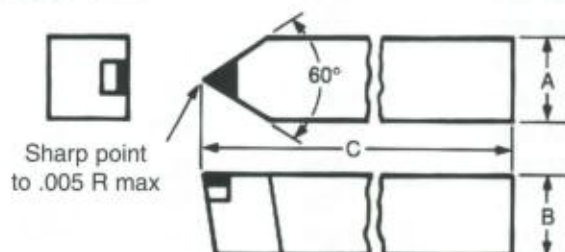
Tool number	A	B	C	R
BR & BL 4	.250	.250	2.000	.016
BR & BL 6	.375	.375	2.500	.016
BR & BL 8	.500	.500	3.500	.031
BR & BL 10	.625	.625	4.000	.031
BR & BL 12	.750	.750	4.500	.031

STYLE D



Tool number	A	B	C	R
D-4	.250	.250	2.000	.016
D-6	.375	.375	2.500	.016
D-8	.500	.500	3.500	.031
D-10	.625	.625	4.000	.031
D-12	.750	.750	4.500	.031
D-16	1.000	1.000	7.000	.031

STYLE E

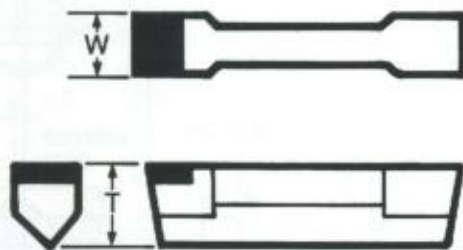


Tool number	A	B	C	R
E-4	.250	.250	2.000	—
E-6	.375	.375	2.500	—
E-8	.500	.500	3.500	—
E-10	.625	.625	4.000	—
E-12	.750	.750	4.500	—

All tools available 1/8" long or 1/4" long cutting edge.
All can be supplied with special radii.

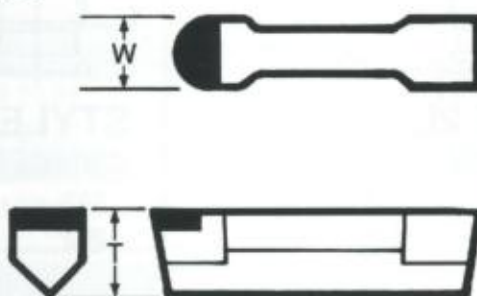
Grooving Tools

VDB—A&B



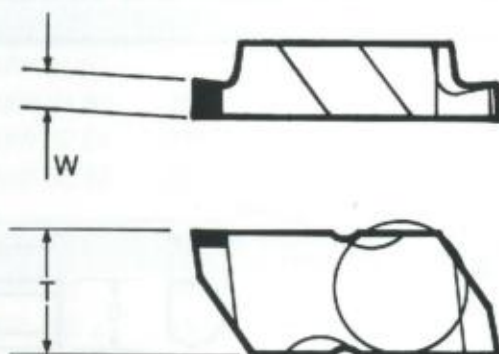
Insert Number	W	T
VDB-125-A-015	.125	.250
VDB-156-A-015	.156	.250
VDB-188-A-015	.188	.250
VDB-250-A-015	.250	.250
VDB-250-B-015	.250	.337
VDB-312-B-015	.312	.337
VDB-375-B-015	.375	.337

VDB—RA & RB



Insert Number	W	T
VDB-125-RA	.125	.250
VDB-156-RA	.156	.250
VDB-188-RA	.188	.250
VDB-218-RA	.218	.250
VDB-250-RA	.250	.250
VDB-250-RB	.250	.337
VDB-281-RB	.281	.337
VDB-312-RB	.312	.337
VDB-344-RB	.344	.337
VDB-375-RB	.375	.337

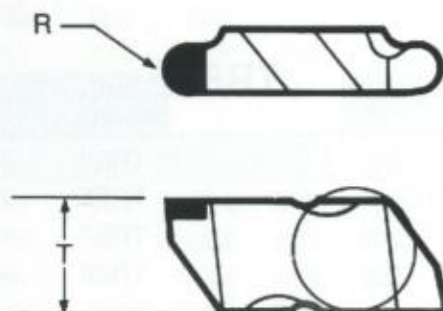
NG (Right and Left)



Insert Number	W	T
NG-2031-R&L	.031	.219
NG-2047-R&L	.047	.219
NG-2062-R&L	.062	.219
NG-2094-R&L	.094	.219
NG-2125-R&L	.125	.219
NG-3047-R&L	.047	.344
NG-3062-R&L	.062	.344
NG-3094-R&L	.094	.344
NG-3125-R&L	.125	.344
NG-3189-R&L	.189	.344
NG-4125-R&L	.125	.375
NG-4189-R&L	.189	.375
NG-4250-R&L	.250	.375

Right hand shown. Left hand opposite.

NR (Right and Left)

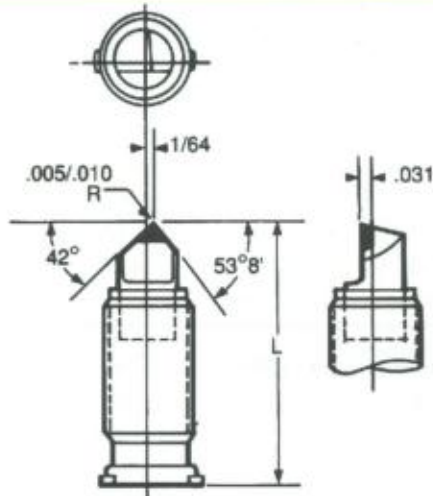


Insert Number	R	T
NR-3031-R&L	.031	.344
NR-3047-R&L	.047	.344
NR-3062-R&L	.062	.344
NR-3078-R&L	.078	.344
NR-3094-R&L	.094	.344
NR-4062-R&L	.062	.375
NR-4094-R&L	.094	.375
NR-4125-R&L	.125	.375

Right hand shown. Left hand opposite.

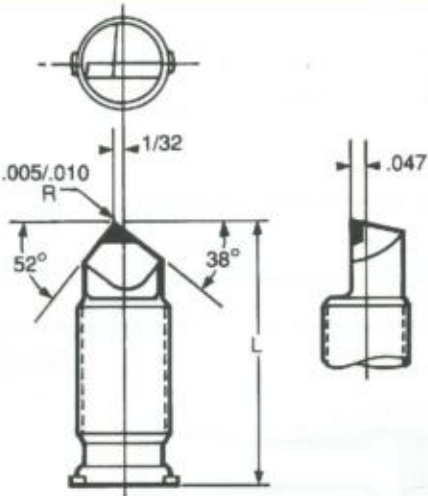
Other sizes and styles of grooving tools available.

Microbore Cartridges



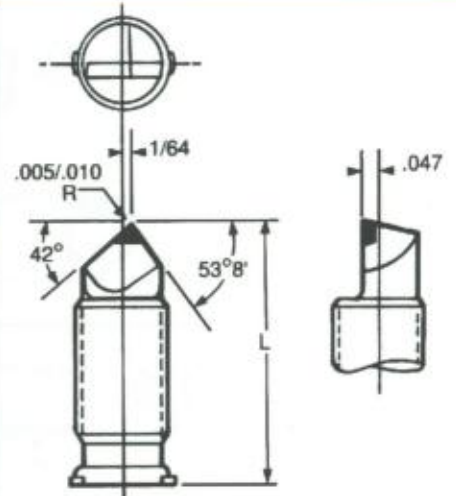
STYLE 1

Cartridge	L
2A1	25/32
2B1	21/32



STYLE 2L

Cartridge	L
2A2L	25/32
2B2L	21/32

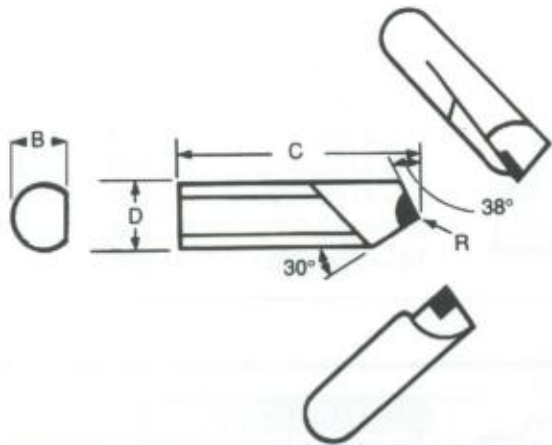


STYLE 2

Cartridge	L
2A2	25/32
2B2	21/32

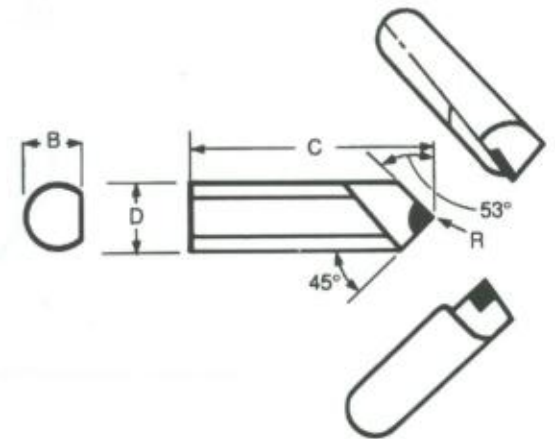
Cartridge size #2 shown available in sizes #1 to #9

Boring tools—Round Shanks



TRC

Tool Number	D	B	C	R
TRC5	.313	.297	1.500	.005
TRC6	.375	.344	1.750	.005
TRC7	.438	.406	2.500	.005
TRC8	.500	.469	2.500	.005



TRE

Tool Number	D	B	C	R
TRE5	.313	.297	1.500	.005
TRE6	.375	.344	1.750	.005
TRE7	.438	.406	2.500	.005
TRE8	.500	.469	2.500	.005

Special radii available.

Standard CBN Inserts

CCMW



Insert	I.C.	T	R
CCMW 21.51	.250	.094	.016
CCMW 21.52	.250	.094	.031
CCMW 32.51	.375	.156	.016
CCMW 32.52	.375	.156	.031

CDCD



Insert	I.C.	T	R
CDCD 505	.156	.047	.007
CDCD 51	.156	.047	.016
CDCD 52	.156	.047	.031

CPGM



Insert	I.C.	T	R
CPGM 21.51	.250	.094	.016
CPGM 21.52	.250	.094	.031
CPGM 32.51	.375	.156	.016
CPGM 32.52	.375	.156	.031

CNGA



Insert	I.C.	T	R
CNGA 431	.500	.187	.016
CNGA 432	.500	.187	.031
CNGA 433	.500	.187	.046

DCMW



Insert	I.C.	T	R
DCMW 21.51	.250	.094	.016
DCMW 21.52	.250	.094	.031
DCMW 32.51	.375	.156	.016
DCMW 32.52	.375	.156	.031

DNGA



Insert	I.C.	T	R
DNGA 431	.500	.187	.016
DNGA 432	.500	.187	.031
DNGA 433	.500	.187	.046

TPMW



Insert	I.C.	T	R
TPMW 21.51	.250	.094	.016
TPMW 21.52	.250	.094	.031
TPMW 32.51	.375	.156	.016
TPMW 32.52	.375	.156	.031

TCMW



Insert	I.C.	T	R
TCMW 21.51	.250	.094	.016
TCMW 21.52	.250	.094	.031
TCMW 32.51	.375	.156	.016
TCMW 32.52	.375	.156	.031

TDED



Insert	I.C.	T	R
TDED 505	.156	.047	.007
TDED 51	.156	.047	.016
TDED 52	.156	.047	.031

TP



Insert	I.C.	T	R
TP 40	.250	.094	*
TP 41	.250	.094	.016
TP 42	.250	.094	.031
TP 61	.375	.125	.016
TP 62	.375	.125	.031

TPG



Insert	I.C.	T	R
TPG 221	.250	.125	.016
TPG 222	.250	.125	.031
TPG 321	.375	.125	.016
TPG 322	.375	.125	.031
TPG 431	.500	.187	.016
TPG 432	.500	.187	.031

TNG



Insert	I.C.	T	R
TNG 221	.250	.125	.016
TNG 222	.250	.125	.031
TNG 321	.375	.125	.016
TNG 322	.375	.125	.031
TNG 332	.375	.187	.031
TNG 431	.500	.187	.016
TNG 432	.500	.187	.031
TNG 433	.500	.187	.046

TNMA



Insert	I.C.	T	R
TNMA 221	.250	.125	.016
TNMA 222	.250	.125	.031
TNMA 321	.375	.125	.016
TNMA 322	.375	.125	.031
TNMA 331	.375	.187	.016
TNMA 332	.375	.187	.031
TNMA 432	.500	.187	.031
TNMA 433	.500	.187	.046

TBEE



Insert	I.C.	T	R
TBEE 521	.156	.062	.016
TBEE 522	.156	.062	.031

Standard CBN Inserts

SNMA



Insert	I.C.	T	R
SNMA 322	.375	.125	.031
SNMA 323	.375	.125	.046
SNMA 432	.500	.187	.031
SNMA 433	.500	.187	.046

VNMA



Insert	I.C.	T	R
VNMA 331	.375	.187	.016
VNMA 332	.375	.187	.031
VNMA 431	.500	.187	.016
VNMA 432	.500	.187	.031

SNG



Insert	I.C.	T	R
SNG 322	.375	.125	.031
SNG 323	.375	.125	.046
SNG 422	.500	.125	.031
SNG 423	.500	.125	.046
SNG 432	.500	.187	.031
SNG 433	.500	.187	.046

Full Face CBN Inserts

SNG



Insert	I.C.	T	R
SNG 322	.375	.125	.031
SNG 323	.375	.125	.046
SNG 324	.375	.125	.062
SNG 422	.500	.125	.031
SNG 423	.500	.125	.046
SNG 424	.500	.125	.062
SNG 432	.500	.187	.031
SNG 433	.500	.187	.046
SNG 434	.500	.187	.062

RNG



Insert	I.C.	T	R
RNG 32	.375	.125	*
RNG 42	.500	.125	*
RNG 43	.500	.187	*

TNG



Insert	I.C.	T	R
TNG 222	.250	.125	.031
TNG 223	.250	.125	.046
TNG 322	.375	.125	.031
TNG 323	.375	.125	.046
TNG 324	.375	.125	.062
TNG 433	.500	.187	.046
TNG 434	.500	.187	.062

Solid CBN Inserts

SNM



Insert	I.C.	T	R
SNM 322	.375	.125	.031
SNM 323	.375	.125	.046
SNM 324	.375	.125	.062
SNM 423	.500	.125	.046
SNM 424	.500	.125	.062

TNM



Insert	I.C.	T	R
TNM 221	.125	.125	.016
TNM 222	.125	.125	.031
TNM 223	.125	.125	.046
TNM 224	.125	.125	.062

RNM



Insert	I.C.	T	R
RNM 32	.375	.125	*
RNM 42	.500	.125	*

CNM



Insert	I.C.	T	R
CNM 322	.375	.125	.031
CNM 323	.375	.125	.046
CNM 324	.375	.125	.062



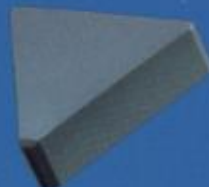
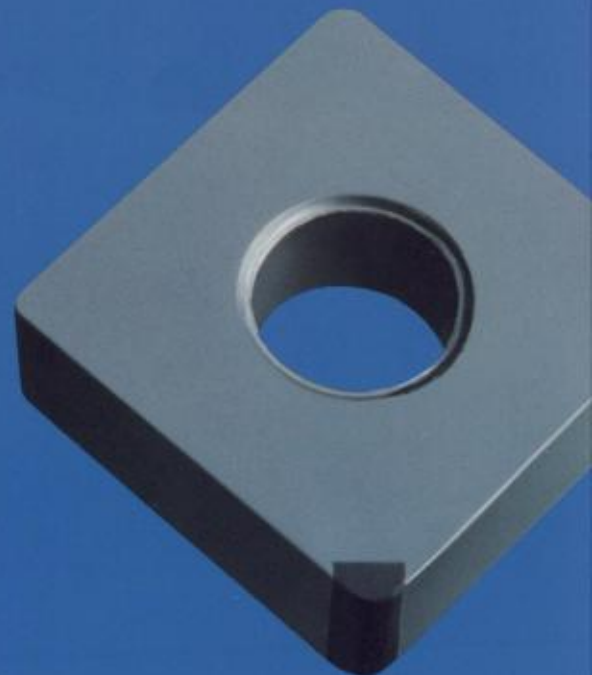
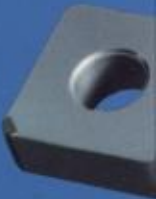
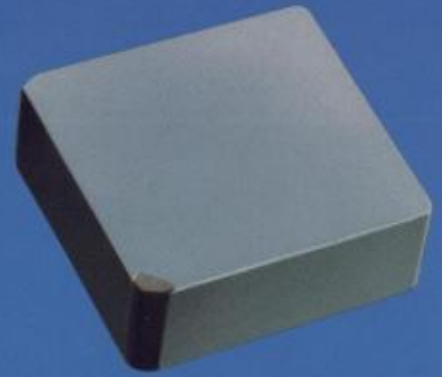
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Precision cutting of CBN form tools and grooving tools. Design engineers operate our CMC wire EDM systems.



Quality control is insured by optical inspection, mechanical measuring and dedicated people.



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J&M Diamond Tool, Inc. specializes in the design and manufacture of CBN, polycrystalline and natural diamond tooling, diamond dressing and cleaving tools, diamond scribes and engravers.

Besides our regular lines, we constantly design and manufacture custom parts for many applications.

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Gilmore Diamond Tool, Inc., our affiliate company, specializes in the manufacture of diamonds for test and measurement. Applications include indenters and test blocks for Rockwell and micro-hardness testing, gage contacts or stylus for surface finish and grinding measurement systems.



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