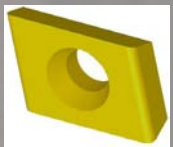
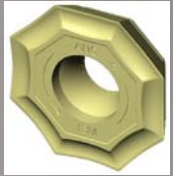




# **American National Carbide**

**Milling, Drilling and Boring Inserts**

**Catalog and Technical Information**





**American National Carbide has been a leading manufacturer of cemented carbide products for the metalworking, rock drilling, construction, and wear part industries since 1970. Headquartered in the Houston area for over 30 years, ANC has been recognized time and time again as an example of American manufacturing excellence.**

**Investment in modern equipment, some of which is illustrated on this page, allows ANC to maintain close quality control throughout its powder production, pressing, sintering, grinding, and coating operations. Our confidence in our quality is such that our ANC Guarantee™ provides you with the assurance that any product not meeting specification will be replaced free of charge.**

**ANC's team of in-house customer service and technical support personnel are ready to answer your questions. Sales representatives and application specialists are located throughout the United States to provide field support.**

**ANC has a long established reputation of providing exceptional value to its customers based on its principles of quality, performance and service.**



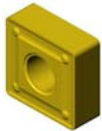
# Contents



**Milling and Drilling Inserts for Screw Fastening Systems..... 10**  
 A variety of inserts for automotive milling, end milling face milling, and drilling.

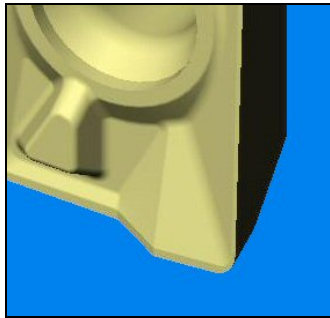


**Positive and Negative Rake Milling Inserts for Top Clamping Systems..... 17**  
 Wide array of ISO standard and special inserts for face milling and automotive milling.

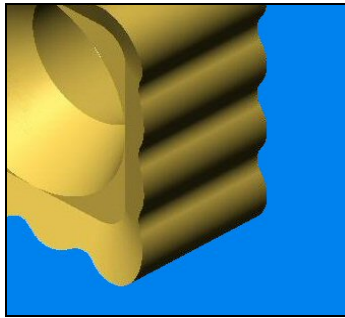


**Negative Rake Milling and Boring Inserts for Lock Pin Fastening Systems..... 30**  
 A full selection of standard negative rake milling and boring inserts for machining almost any workpiece material.

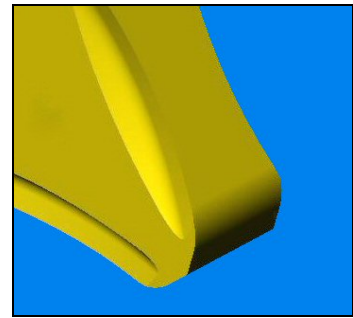
## Product Highlights



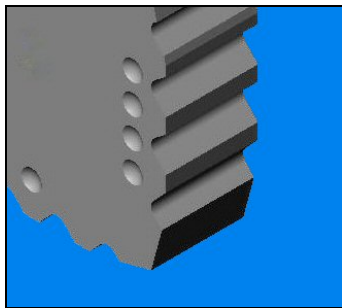
Endmill inserts interchangeable with Iscar®, Ingersoll® and Carboly® cutters on page 10



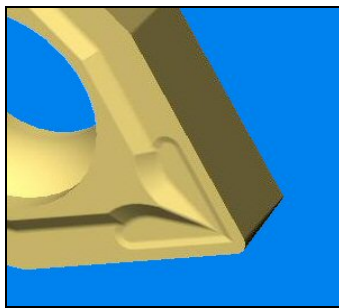
See pages 14-15 for ANC's selection of inserts interchangeable with K-Tool® milling and drilling inserts



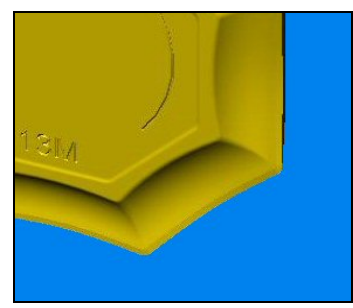
Popular styles of automotive milling inserts can be found throughout the catalog



See pages 17, 25 & 30 for ANC's line of replacement inserts for Milling Specialties TriPhase® cutters



See page 16 for ANC's offering of popular trigon drilling inserts

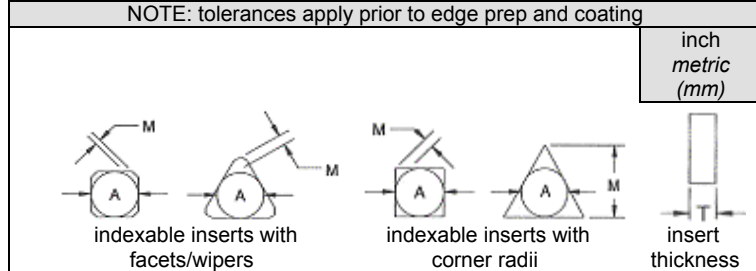


Octagon milling inserts for use in Carboly® cutters can be found on pages 12, 13 & 19



# Milling Insert Identification System

NOTE: tolerances apply prior to edge prep and coating

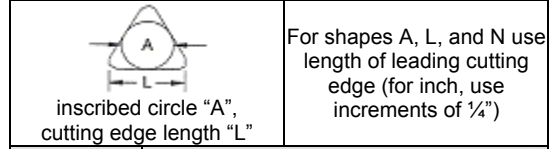


A	TOLERANCES ON "A"		TOLERANCES ON "M"	
	CLASSES J, K, L, M, N	CLASS U	CLASSES M, N	CLASS U
.1875 through .3937 4,76 through 10,00	.002 0,051	.003 0,076	.003 0,076	.005 0,127
.4375 through .5625 11,11 through 14,29	.003 0,076	.005 0,127	.005 0,127	.008 0,203
.5906 through .8125 15,00 through 20,64	.004 0,102	.007 0,178	.006 0,152	.011 0,279
.8661 through 1.188 22,00 through 31,16	.005 0,127	.010 0,254	.007 0,178	.015 0,381
1.250 through 1.378 31,75 through 35,00	.006 0,152	.010 0,254	.008 0,203	.015 0,381

	A	M	T		A	M	T
A	.001 0,025	.0002 0,005	.001 0,025	H	.0005 0,013	.0005 0,013	.001 0,025
B	.001 0,025	.0002 0,005	.005 0,130	J	*.002 - .005 *0,05 - 0,13	.0002 0,005	.001 0,025
C	.001 0,025	.0005 0,013	.001 0,025	K	*.002 - .005 *0,05 - 0,13	.0005 0,013	.001 0,025
D	.001 0,025	.0005 0,013	.005 0,130	L	*.002 - .005 *0,05 - 0,13	.001 0,025	.001 0,025
E	.001 0,025	.001 0,025	.001 0,025	M	*.002 - .004 *0,05 - 0,10	*.002 - .010 *0,05 - 0,25	.005 0,130
F	.0005 0,013	.0002 0,005	.001 0,025	N	*.002 - .004 *0,05 - 0,10	*.002 - .010 *0,05 - 0,25	.001 0,025
G	.001 0,025	.001 0,025	.005 0,130	U	*.003 - .010 *0,08 - 0,25	*.005 - .012 *0,13 - 0,30	.005 0,130

\* See table above for tolerances according to insert size and class

### 3 - TOLERANCE



For shapes A, L, and N use length of leading cutting edge (for inch, use increments of 1/4")

INCH		METRIC								
SYMBOL	A	A	L (for insert shape indicated)							
			S	T	R	O	C	H	E	
-	-	6,00	-	-	06	-	-	-	-	
2	1/4	6,35	06	11	06	02	06	03	06	
-	-	8,00	-	-	08	-	-	-	-	
3	3/8	9,52	09	16	09	04	09	05	09	
-	-	10,00	-	-	10	-	-	-	-	
-	-	12,00	-	-	12	-	-	-	-	
4	1/2	12,70	12	22	12	05	12	07	13	
5	5/8	15,88	15	27	15	06	16	09	16	
-	-	16,00	-	-	16	-	-	-	-	
6	3/4	19,05	19	33	19	07	19	11	19	
-	-	20,00	-	-	20	-	-	-	-	
-	-	25,00	-	-	25	-	-	-	-	
8	1	25,40	25	44	25	10	25	14	26	

### 5 - SIZE

SYMBOL	HOLE	SHAPE OF HOLE	CHIPBREAKER
N	without		without
R			single-sided
F			double-sided
A	with	cylindrical hole	without
M			single-sided
G			double-sided
W			without
T			single-sided
B			without
H	single-sided		
C	without	partly cylindrical hole, 70-90° countersink	without
J	double-sided	partly cylindrical hole, 70-90° double countersink	double-sided

### 4 - INSERT TYPE

EXAMPLE

inch	<b>S</b>	<b>E</b>	<b>K</b>	<b>N</b>	
metric	<b>S</b>	<b>E</b>	<b>K</b>	<b>N</b>	
position	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	

1 - SHAPE		
SYMBOL SHAPE	SHAPE	NOSE ANGLE (DEGREES)
A	parallelogram	85
C	diamond	80
E	diamond	75
H	hexagon	120
L	rectangle	90
M	diamond	86
N	diamond	87
O	octagon	135
R	round	-
S	square	90
T	triangle	60

### 2 - RELIEF ANGLE

- N - 0°
- A - 3°
- B - 5°
- C - 7°
- P - 11°
- D - 15°
- E - 20°
- F - 25°
- G - 30°



# Milling Insert Identification System

If symbols are letters, lead angle and wiper edge clearance				If symbols are numbers, corner radius				
LEAD ANGLE			WIPER EDGE CLEARANCE		INCH		METRIC	
SYMBOL	INCH	METRIC	SYMBOL	INCH/METRIC	SYMBOL	inch	SYMBOL	mm
A	45°	45°	A	3°	-	-	M0	round insert
D	Handed 30°	60°	B	5°	0	.004	01	0,1
K	Neutral 30°	-	C	7°	.5	.008	02	0,2
E	Handed 15°	75°	D	15°	1	1/64	04	0,4
L	Handed 15°	-	E	20°	-	-	05	0,5
P	0°	90°	F	25°	2	1/32	08	0,8
			G	30°	-	-	10	1,0
			N	0°	3	3/64	12	1,2
			P	11°	-	-	15	1,5
					4	1/16	16	1,6
					5	5/64	20	2,0
					6	3/32	24	2,4
					7	7/64	28	2,8
					8	1/8	32	3,2

**7 - CORNER CONFIGURATION**

INCH		METRIC	
SYMBOL (1/16")	inch	SYMBOL	mm
1.5	3/32	02	2,38
2	1/8	03	3,18
2.5	5/32	T3	3,97
3	3/16	04	4,76
-	-	M5	5,00
3.5	7/32	05	5,56
4	1/4	06	6,35
5	5/16	07	7,94

**6 - THICKNESS**

SYMBOL	inch
2	.0312
3	.0469
4	.0625
6	.0938

Facet width is number of 1/64" increments (1/32" for old styles)

**10 - FACET WIDTH**

	<b>4</b>	<b>2</b>	<b>AF</b>	<b>T</b>	<b>N</b>	<b>6</b>
	<b>12</b>	<b>03</b>	<b>AF</b>	<b>T</b>	<b>N</b>	<b>-</b>
	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>

**8 - CUTTING EDGE**

 F - Sharp	 E - Honed
 T - T-Land	 S - Honed T-Land

**9 - HAND OF INSERT**

 R	 L	 N
-------	-------	-------



# Workpiece Material Classification Chart

ISO Class	Material Type	Examples
<b>P</b>	Plain carbon steel	1000 series, 1100 series
	Free-machining carbon steel	1100 series, 1200 series
	Alloy and tool steels (150-450 HB, <47 Hrc)	1300 series, 2000 series, 3000 series, 4000 series, 5000 series, 6000 series, 7000 series, 8000 series, 9000 series
	Ferritic, martensitic, and precipitation hardening (PH) stainless steels	400 series, 500 series, 17-4 PH, 15-5 PH
	Cast steels	
<b>M</b>	Austenitic stainless steels (<28 Hrc)	200 series, 300 series, Duplex, ASTM XM series
	Free machining steels	300 series
	Alloy cast irons and malleable irons	ASTM A48 class 50-60
<b>K</b>	Gray cast irons	ASTM A48 class 20-45, SAE J431 series
	Long-chipping malleable irons	
	Short-chipping malleable irons (120-320 HB)	Nodular / ductile, ferritic / pearlitic, pearlitic / martensitic, ASTM A536 series, SAE J434 series, ASTM A47 series, SAE J148 series

For specific workpiece materials not listed here, contact ANC's Customer Service Team at (800) 331-7585.



# Workpiece Material Classification Chart

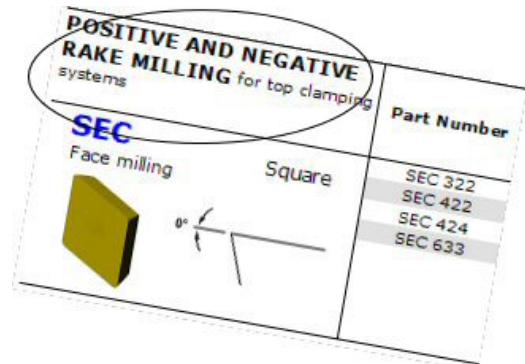
ISO Class	Material Type	Examples
<b>N</b>	Free-machining and low-silicon aluminum alloys (<12.2% Si)	Alcan, Alcoa 510, Duralumin, A2, AA 2000 series, AA 3000 series
	High-silicon aluminum alloys (>12.2% Si)	Duralcan, AA A380 series, AA A390 series, AA A413 series
	Non-ferrous metals	Zirconium, manganese, magnesium, tin alloys, metal matrix composites (MMCs), lead alloys, zinc alloys, tungsten alloys
	Other materials	Carbon and graphite composites, glass, plastics, wood, ceramics, nylon, rubbers, phenolics, and resins
<b>S</b>	Cobalt-based heat-resistant alloys	AiResist, Haynes, Stellite, Jetalloy
	Iron-based heat-resistant alloys	Discaloy, Incoloy 801, N-155, A-286
	Nickel-based heat-resistant alloys	Astroloy, Hastelloy, Inconel, Incoloy 901, Nimonic, Nimocast, Rene, Udimet, Waspaloy, Monel, Refractaloy
	Titanium	Ti98.8, Ti99.9
	Titanium alloys	Ti5Al2.5Sn, TiAl6V4, TiAl6V4ELI
<b>H</b>	Chilled cast irons	
	Tool steels and hardened steels	D2, D3, L2, L3, 440C, 6150, A2, M3, M42, 52100, Ni-Hard coatings
	Hardened cast iron	Carburized and nitrided irons, high chrome white cast iron

For specific workpiece materials not listed here, contact ANC's Customer Service Team at (800) 331-7585.

# How to choose your milling, drilling, or boring tool...

## 1 Select the fastening system...

Lock pin, clamp-style, or screw-on fastening system.



## 2 Select the style of insert ...

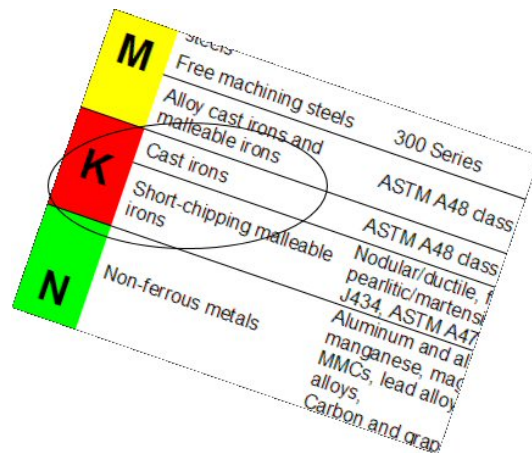
Inserts for automotive milling, face milling, rough milling, end milling...

## 3 Define the material to be machined...

Define the material according to the ISO classification system.

- ISO P** – Carbon and alloy steels
- ISO M** – Stainless steels
- ISO K** – Cast irons
- ISO N** – Non ferrous metals
- ISO S** – High temperature alloys
- ISO H** – Hard materials

See our Workpiece Material Classification Chart on pages 4-5 for details.


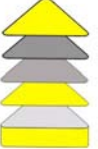









## 4 Select a grade...

Using the grade selection information on pages 7-9, choose the grade best suited for the type of application and material being machined that is available for the style of insert chosen.

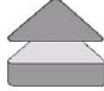



# Grade and Application Data

CVD COATED				
Grade	ISO Class	Industry Class	Description	Coating
<b>AN2015</b> Roughing to Semi-Finishing	P10-P40 M10-M30 K10-K30	C2 C6	AN2015 is based on a hard, cobalt-enriched substrate with good resistance to plastic deformation due to high hot hardness. A CVD coating of TiCN, Al <sub>2</sub> O <sub>3</sub> , and TiN gives it excellent shock and abrasive wear resistance. AN2015 is recommended for roughing to medium machining.	 TiN Al <sub>2</sub> O <sub>3</sub> TiCN Substrate
<b>AN2020</b> Roughing to Semi-Finishing	P15-P30 M15-M30	C6	AN2020 is based on a hard, cobalt-enriched substrate and has a multi-layered gold coating to provide excellent thermal, wear, and mechanical shock resistance. Perfect general-purpose grade for medium speeds and feeds in interrupted to semi-finishing cuts on carbon and alloy steels.	 TiN TiCN TiC TiN Substrate
<b>AN2025</b> Roughing to Semi-Finishing	P15-P35 M15-M25	C5	AN2025 has a tough, cobalt-enriched substrate with a multi-layer TiCN/Al <sub>2</sub> O <sub>3</sub> /TiN coating to enhance edge strength. This is the preferred grade for high speed machining of stainless steels and most steels. Performs well in roughing to semi-finishing.	 TiN Al <sub>2</sub> O <sub>3</sub> TiCN Substrate
<b>AN2035</b> Roughing, Interrupted Cuts	P25-P40 M20-M35	C5	AN2035 has a very tough, cobalt-enriched substrate with a four-layer coating of TiN, TiC, TiCN, and TiN. Designed for general purpose machining and roughing of carbon, alloy, and stainless steels at low to medium speeds and medium to high feed rates. Can withstand severe interruptions.	 TiN TiCN TiC TiN Substrate
<b>AN3020</b> Semi-Finishing to Finishing	P15-P30 M10-M30 K10-K30	C2 C6	AN3020 is based on a hard substrate with good resistance to plastic deformation due to high hot hardness. A CVD coating of TiCN and Al <sub>2</sub> O <sub>3</sub> provides excellent flank wear resistance. Designed for light roughing of cast irons and medium-speed machining of alloy steels in the hardness range of 25 to 40 HRc. Can withstand light interruptions.	 Al <sub>2</sub> O <sub>3</sub> TiCN Substrate
<b>AN3030</b> Light Roughing to Finishing	P15-P40 M15-M40 K15-K30 H15-H30	C2 C5-C6	AN3030 is based on a tough, high wear-resistant substrate with a TiCN/Al <sub>2</sub> O <sub>3</sub> /TiN coating. Specially developed for milling operations, AN3030 can be used on a wide variety of steels, stainless steels, and cast iron at medium to high speeds.	 TiN Al <sub>2</sub> O <sub>3</sub> TiCN Substrate
<b>AN4030</b> Roughing to Semi-Finishing	P30-P40 M25-M35	C5	AN4030 has a very tough alloyed, cobalt-enriched substrate with a multi-layered TiN/TiC/TiCN/TiN coating. A great general-purpose grade for drilling at medium to high cutting speeds.	 TiN TiCN TiC TiN Substrate
<b>AN4040</b> Light Roughing to Finishing	P25-P40 M20-M35	C5 C6	AN4040 is a tough, unalloyed substrate coated with a multi-layered TiN/TiC/TiCN/TiN coating. Fine grain structure offers good wear resistance. Preferred choice for drilling.	 TiN TiCN TiC TiN Substrate
<b>AN4045</b> Roughing, Interrupted Cuts	P30-P45 M25-M40	C5	AN4045 is an extremely tough grade with a four layer coating of TiN, TiC, TiCN, and TiN. This is an excellent grade for machining at low cutting speeds and very high feed rates in severe interrupted cuts. Designed for rough milling and drilling of steels and stainless steels.	 TiN TiCN TiC TiN Substrate



# Grade and Application Data

PVD COATED				
Grade	ISO Class	Industry Class	Description	Coating
<b>AN4120</b> Roughing to Semi-Finishing	P30-P40 M25-M40	C5	AN4120 has a very tough cobalt-enriched substrate that is PVD coated with a thin layer of TiCN to provide abrasion resistance and edge strength. Preferred grade for rough milling steels and stainless steels.	 TiCN Substrate
<b>AN6115</b> Light Roughing to Finishing	N05-N15 S10-S25	C3	AN6115 is a PVD TiN coated grade with a very fine grained, hard substrate developed for non-ferrous materials and high temperature alloys. The preferred grade for machining aluminum.	 TiN Substrate

UNCOATED				
Grade	ISO Class	Industry Class	Description	
<b>AN2</b> Roughing to Semi-Finishing	K10-K25 N05-N15 S10-S20	C2	AN2 is an uncoated, unalloyed grade with good abrasive wear resistance. Designed for medium to rough milling and drilling of cast iron, non-ferrous materials, and high temperature alloys.	
<b>AN6</b> Roughing to Semi-Finishing	P25-P35	C5 C6	AN6 is an uncoated alloyed grade for general purpose machining of steels. Good balance of wear resistance and toughness. Designed for medium cutting speeds and feed rates with medium interrupted cuts.	
<b>AN20</b> Roughing to Medium Machining	K25-K40 N20-N35 S20-S35	C1	AN20 is an uncoated, unalloyed micro-grain grade with medium abrasion resistance and high fracture toughness. Designed for rough milling and drilling of cast irons, non-ferrous metals, and high-temperature alloys	
<b>AN23</b> Semi-Finishing to Finishing	K05-K20 N01-N10 S05-S15	C3	AN23 is an uncoated, hard, unalloyed sub-micron grain grade. Exhibits excellent edge wear resistance combined with very high strength for machining heat resistant alloys, titanium, aluminum, and non-metals at high speeds and low feeds.	
<b>AN28</b> Roughing to Finishing	K15-K30 N10-N20	C2	AN28 is an uncoated, alloyed substrate specifically designed for roughing to finishing operations on cast irons and non-ferrous materials. First choice for nodular cast iron.	





# Grade and Application Data


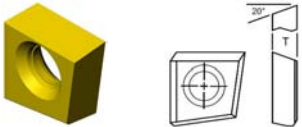
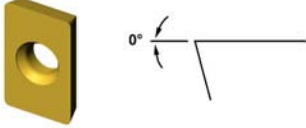
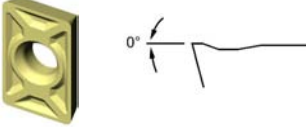
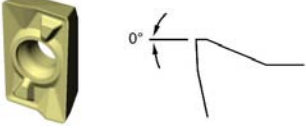
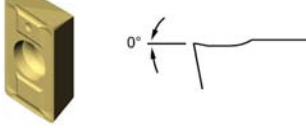
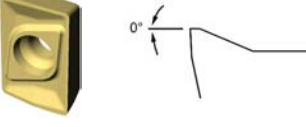
<b>P</b> Steel alloys, cast steels, ferritic and martensitic stainless steels, and long chipping malleable irons					<b>M</b> Austenitic stainless steel, free machining steel, manganese steel, alloy cast iron, and malleable iron					<b>K</b> Cast iron and short chipping malleable iron								
C8		C7		C6	C5							C4		C3		C2	C1	
P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30	K40				
		AN2015					AN2015					AN2015						
		AN2020					AN2020					AN2020						
		AN2025					AN2025					AN2025						
			AN2035					AN2035					AN2035					
		AN3020					AN3020						AN2				AN20	
		AN3030					AN3030					AN23						
			AN4030					AN4030				AN28						
			AN4040					AN4040										
			AN4045					AN4045										
			AN4120					AN4120										
			AN6															
More Wear ← → More Toughness					More Wear ← → More Toughness					More Wear ← → More Toughness								

<b>N</b> Non-ferrous metals, plastics, and wood					<b>S</b> High temperature alloys (nickel, iron, and cobalt based), titanium and titanium alloys					<b>H</b> Hard materials, such as chilled cast iron, hardened steel and hardened cast iron				
N01	N10	N20	N30	N40	S01	S10	S20	S30	S40	H01	H10	H20	H30	H40
	AN6115						AN6115						AN3030	
	AN2						AN2							
			AN20					AN20						
	AN23						AN23							
		AN28												
More Wear ← → More Toughness					More Wear ← → More Toughness					More Wear ← → More Toughness				



# Milling and Drilling Inserts for screw fastening systems

## MILLING AND DRILLING for screw fastening systems

	Part Number	Coated										Uncoated				Dimensions (inches)					
		AN2015	AN2020	AN2035	AN3020	AN3030	AN4030	AN4040	AN4045	AN4120	AN6115	AN2	AN6	AN20	AN28	IC	Thick.	Radius / Flat	Hole		
<b>4.21-611</b> Automotive milling 	4.21103R611				•									•				-	.157	-	.189
	4.21103L611				•									•				-	.157	-	.189
<b>4.21-616</b> Automotive milling 	4.21107R616				•									•				-	.157	-	.189
	4.21107L616				•									•				-	.157	-	.189
<b>ADCB</b> End milling 	ADCB 150304					•												3/8	1/8	1/64	.177
	ADCB 150308					•												3/8	1/8	1/32	.177
	ADCB 150312					•												3/8	1/8	3/64	.177
<b>ADCH</b> End milling 	ADCH 150304					•												3/8	1/8	1/64	.177
	ADCH 150308					•												3/8	1/8	1/32	.177
	ADCH 150312					•												3/8	1/8	3/64	.177
<b>APEH</b> End milling 	APEH 532PDR					•												5/8	3/16	1/32	.173
	APEH 534PDR					•												5/8	3/16	1/16	.173
	APEH 538PDR					•												5/8	3/16	1/8	.173
<b>APFT</b> End milling 	APFT 1604PDR					•												3/8	3/16	1/32	.173
<b>APKT</b> End milling 	APKT 1003PDR					•												.262	.137	.019	.110

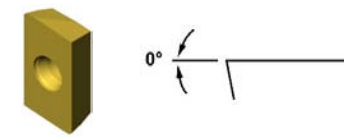
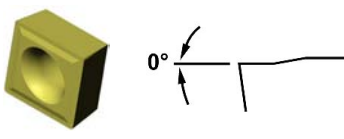
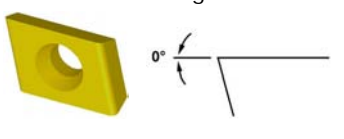
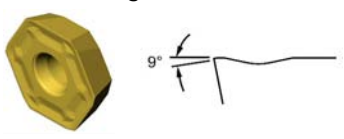
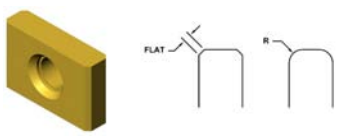
Grade details, see pages 7-9

Nomenclature explanation, see pages 2-3



# Milling and Drilling Inserts for screw fastening systems

## MILLING AND DRILLING for screw fastening systems

	Part Number	Coated										Uncoated				Dimensions (inches)				
		AN2015	AN2020	AN2035	AN3020	AN3030	AN4030	AN4040	AN4045	AN4120	AN6115	AN2	AN6	AN20	AN28	IC	Thick.	Radius / Flat	Hole	
<b>APKW</b> End milling 85° Parallelogram 	APKW 1604PDR					•											3/8	3/16	.057	.173
<b>CCGT-GF</b> Drilling, Boring 80° Diamond 	CCGT 21.50-GF	•	•														1/4	3/32	.004	.112
	CCGT 21.51-GF	•	•														1/4	3/32	1/64	.112
	CCGT 21.52-GF	•	•														1/4	3/32	1/32	.112
	CCGT 32.50-GF	•	•														3/8	5/32	.004	.179
	CCGT 32.51-GF	•	•														3/8	5/32	1/64	.179
	CCGT 32.52-GF	•	•														3/8	5/32	1/32	.179
<b>CDE</b> Automotive milling 80° Diamond 	CDE 322R05				•	•											3/8	.150	1/32	.168
	CDE 322L05				•	•											3/8	.150	1/32	.168
	CDE 322R02				•	•											3/8	.150	1/16	.168
	CDE 322L02				•	•											3/8	.150	1/16	.168
	CDE 322R03				•	•											3/8	.150	3/32	.168
	CDE 322L03				•	•											3/8	.150	3/32	.168
	CDE 322R04				•	•											3/8	.150	1/8	.168
	CDE 322L04				•	•											3/8	.150	1/8	.168
	CDE 323L05				•	•											3/8	3/16	1/32	.168
CDE 334R04				•	•											3/8	1/4	13/64	.168	
<b>HPCT</b> Face milling Hexagon 	HPCT 0904ADN					•											5/8	3/16	.077	.215
<b>LNE</b> Automotive milling Rectangle 	LNE 323-01				•	•											3/8	3/16	.06 x 30°	.161
	LNE 323-02				•	•											3/8	3/16	.03 x 45°	.161
	LNE 323-04				•	•											3/8	3/16	.060	.161
	LNE 324-05				•	•											3/8	1/4	.03 x 45°	.161
	LNE 433-20				•	•											1/2	3/16	.03 x 45°	.217
	LNE 434-02				•	•											1/2	1/4	.03 x 45°	.217
	LNE 434-05				•	•											9/16	1/4	.060	.217
	LNE 434-20				•	•											1/2	1/4	.03 x 45°	.217
	LNE 443-01				•	•											1/2	3/16	.090	.212
	LNE 443-20				•	•											1/2	3/16	.03 x 45°	.217
	LNE 444-20				•	•											1/2	1/4	.03 x 45°	.217
LNE 446-01				•	•											9/16	3/8	.06 x 45°	.217	

Grade details, see pages 7-9

Nomenclature explanation, see pages 2-3



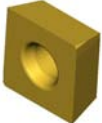


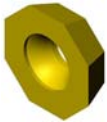
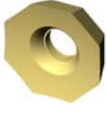
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**MILLING AND DRILLING** for screw fastening systems

	Part Number	Coated										Uncoated				Dimensions (inches)				
		AN2015	AN2020	AN2035	AN3020	AN3030	AN4030	AN4040	AN4045	AN4120	AN6115	AN2	AN6	AN20	AN28	IC	Thick.	Radius / Flat	Hole	
<b>LSE</b> Face milling Rectangle 	LSE 444L01					•											1/2	.280	-	.183
	LSE 444R01					•												1/2	.280	-
<b>MDGH</b> Drilling 86° Diamond 	MDGH 21.5						•	•									1/4	.100	.044	.102
	MDGH 2.52						•	•										.308	.120	.040
<b>MPFW</b> Drilling 86° Diamond 	MPFW 110400N					•											7/16	3/16	-	.177
<b>MPGH</b> Drilling 86° Diamond 	MPGH 2.52						•	•									.308	.120	.039	.135
	MPGH 32						•	•									.368	.120	.040	.176
	MPGH 3.53						•	•									.430	.182	.046	.176
	MPGH 43						•	•									.494	.182	.050	.220
	MPGH 4.53						•	•									.555	.182	.049	.220
	MPGH 53						•	•									.619	.182	.048	.220
<b>NDCB</b> End milling 86° Parallelogram 	NDCB 1503PDR					•											3/8	1/8	1/16	.175
<b>OECW</b> Face milling Octagon 	OECW 531					•											5/8	3/16	1/64	.205
<b>OECX</b> Face milling Octagon 	OECX 531										•						5/8	3/16	1/64	.205

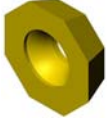





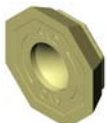

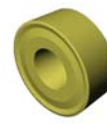


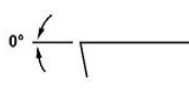
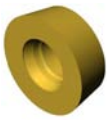

Grade details, see pages 7-9

Nomenclature explanation, see pages 2-3



# Milling and Drilling Inserts for screw fastening systems

## MILLING AND DRILLING for screw fastening systems

	Part Number	Coated										Uncoated					Dimensions (inches)					
		AN2015	AN2020	AN2035	AN3020	AN3030	AN4030	AN4040	AN4045	AN4120	AN6115	AN2	AN6	AN20	AN28	IC	Thick.	Radius / Flat	Hole			
<b>OFCW</b> Face milling  	Octagon	OFCW 531																	5/8	3/16	1/64	.205
<b>OFCX</b> Face milling  	Octagon	OFCX 531																	5/8	3/16	1/64	.205
<b>OFET-13M</b> Face milling  	Octagon	OFET 070405-13M																	.706	3/16	.020	.221
<b>OFEW</b> Face milling  	Octagon	OFEW 070405																	.706	3/16	.020	.221
<b>RCMT</b> Face milling  	Round	RCMT 100300	•																.390	1/8	-	.173
	RCMT 120400	•																	.472	3/16	-	.173
	RCMT 160600	•																	.630	1/2	-	.205
	RCMT 200600	•																	.790	1/2	-	.258
	RCMT 250700	•																	.984	5/16	-	.285
	RCMT 320900	•																	1.260	3/8	-	.374
<b>RD-P</b> Face milling  	Round	RD 6P																	3/8	1/8	-	.125
	RD 12P																		3/4	3/16	-	.221
	RD 16P																		1	1/4	-	.280
<b>RDCW</b> Face milling  	Round	RDCW 43																	1/2	3/16	-	.204

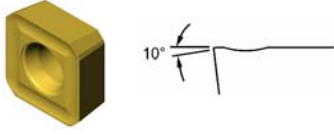
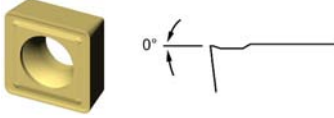
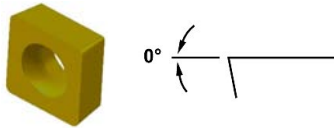
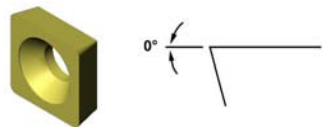
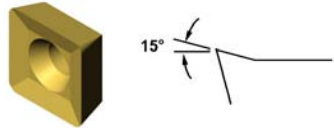
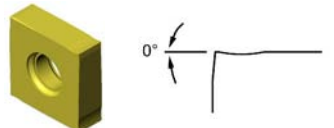
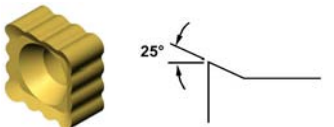
Grade details, see pages 7-9

Nomenclature explanation, see pages 2-3



# Milling and Drilling Inserts for screw fastening systems

## MILLING AND DRILLING for screw fastening systems

	Part Number	Coated										Uncoated				Dimensions (inches)				
		AN2015	AN2020	AN2035	AN3020	AN3030	AN4030	AN4040	AN4045	AN4120	AN6115	AN2	AN6	AN20	AN28	IC	Thick.	Radius / Flat	Hole	
<b>SCCT</b> Face and end milling 	SCCT 12M5ACR					•											1/2	.197	.072	.215
<b>SCGT-FM</b> Drilling, Boring 	SCGT 32.51-FM	•	•								•					3/8	5/32	1/64	.179	
	SCGT 32.52-FM	•	•								•					3/8	5/32	1/32	.179	
<b>SCGW</b> Face milling 	SCGW 32.52										•					3/8	5/32	1/32	.179	
<b>SDEB</b> Face and end milling 	SDEB 21.51			•	•				•							1/4	3/32	1/64	.115	
	SDEB 633			•	•			•								3/4	3/16	3/64	.312	
<b>SDEH</b> Face milling 	SDEH 2.522			•	•				•							5/16	1/8	1/32	.115	
<b>SNCC</b> Slot milling 	SNCC 113.6SPT					•										.433	.145	-	.174	
<b>SNMC</b> Rough end milling 	SNMC 222			•					•							1/4	1/8	1/32	.115	
	SNMC 333			•					•							3/8	3/16	3/64	.145	

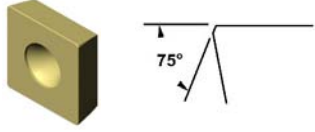
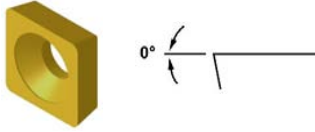
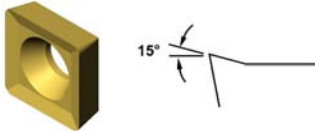
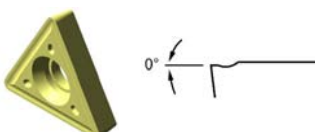
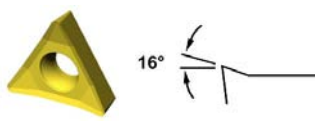
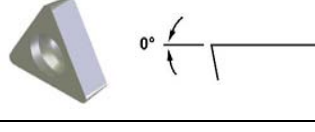
Grade details, see pages 7-9

Nomenclature explanation, see pages 2-3



# Milling and Drilling Inserts for screw fastening systems

## MILLING AND DRILLING for screw fastening systems

	Part Number	Coated										Uncoated				Dimensions (inches)				
		AN2015	AN2020	AN2035	AN3020	AN3030	AN4030	AN4040	AN4045	AN4120	AN6115	AN2	AN6	AN20	AN28	IC	Thick.	Radius / Flat	Hole	
<b>SPCW-T</b> Face milling Square 	SPCW 642T					•											3/4	1/4	1/32	.258
<b>SPEB</b> Face and end milling Square 	SPEB 221			•	•				•								1/4	1/8	1/64	.115
	SPEB 222			•	•				•								1/4	1/8	1/32	.115
	SPEB 322			•	•			•	•	•							3/8	1/8	1/32	.158
	SPEB 422			•	•			•	•	•							1/2	1/8	1/32	.178
	SPEB 532								•		•						5/8	3/16	1/32	.217
	SPEB 633								•		•						3/4	3/16	3/64	.312
<b>SPEH</b> Face and end milling Square 	SPEH 222			•	•				•								1/4	1/8	1/32	.115
	SPEH 2.522			•	•				•								5/16	1/8	1/32	.115
	SPEH 322			•	•				•								3/8	1/8	1/32	.156
	SPEH 332			•	•				•								3/8	3/16	1/32	.150
	SPEH 432			•	•				•								1/2	3/16	1/32	.215
	SPEH 433			•	•				•								1/2	3/16	3/64	.215
<b>TCGT</b> Drilling, Boring Triangle 	TCGT 21.50	•	•								•						1/4	3/32	.005	.123
	TCGT 21.51	•	•								•						1/4	3/32	1/64	.123
	TCGT 21.52	•	•								•						1/4	3/32	1/32	.123
	TCGT 221	•	•								•						1/4	1/8	1/64	.123
	TCGT 222	•	•								•						1/4	1/8	1/32	.123
	TCGT 321	•	•								•						3/8	1/8	1/64	.177
	TCGT 322	•	•								•						3/8	1/8	1/32	.177
	TCGT 323	•	•								•						3/8	1/8	3/64	.177
	TCGT 32.51	•	•								•						3/8	5/32	1/64	.177
	TCGT 32.52	•	•								•						3/8	5/32	1/32	.177
	TCGT 431	•	•								•						1/2	3/16	1/64	.218
	TCGT 432	•	•								•						1/2	3/16	1/32	.218
	TCGT 433	•	•								•						1/2	3/16	3/64	.218
<b>TCGT-HP</b> Drilling, Boring Triangle 	TCGT 32.52-HP									•							3/8	5/32	1/32	.177
<b>TCGW</b> Boring Triangle 	TCGW 731										•						7/32	3/32	1/64	.095

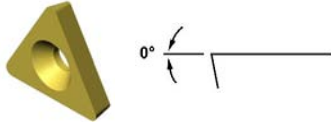

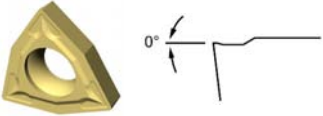
Grade details, see pages 7-9

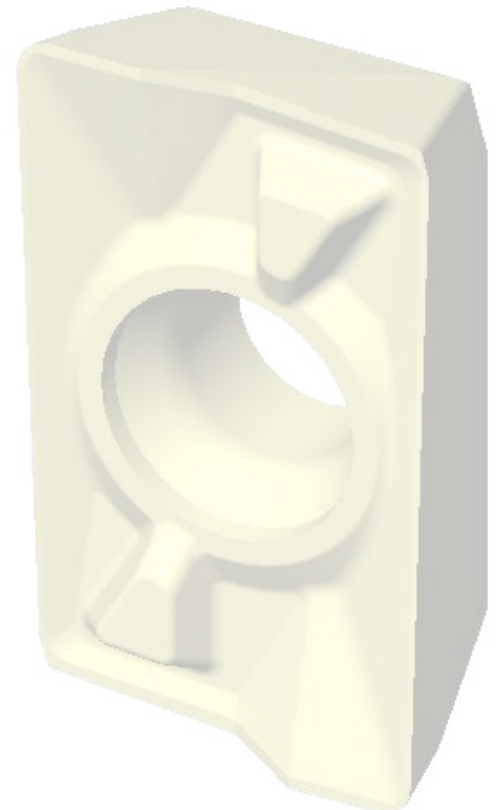
Nomenclature explanation, see pages 2-3



# Milling and Drilling Inserts for screw fastening systems

## MILLING AND DRILLING for screw fastening systems

	Part Number	Coated										Uncoated				Dimensions (inches)					
		AN2015	AN2020	AN2035	AN3020	AN3030	AN4030	AN4040	AN4045	AN4120	AN6115	AN2	AN6	AN20	AN28	IC	Thick.	Radius / Flat	Hole		
<b>TD-P</b> Face milling Triangle 	TD 6P																3/8	1/8	1/32	.130	
	TD 8P																	1/2	3/16	1/32	.177
	TD 10P																	5/8	3/16	1/16	.250
<b>TEGX-BN</b> End milling Triangle 	TEGX 356-625-BN																.356	.167	-	.135	
	TEGX 422-750-BN																	.422	.171	-	.173
	TEGX 427-1000-BN																	.427	.171	-	.173
<b>WCGT</b> Drilling Trigon 	WCGT 020102																.156	.063	.008	.091	
	WCGT 020104																	.156	.063	1/64	.091
	WCGT 030202																	.219	3/32	.008	.091
	WCGT 030204																	.219	3/32	1/64	.091
	WCGT 040202																	1/4	3/32	.008	.112
	WCGT 040204																	1/4	3/32	1/64	.112
	WCGT 06T304																	3/8	5/32	1/64	.175
	WCGT 06T308																	3/8	5/32	1/32	.175



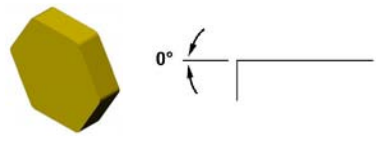
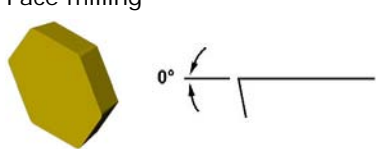
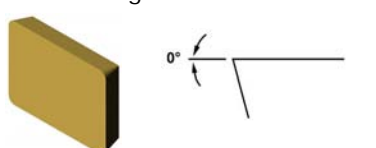
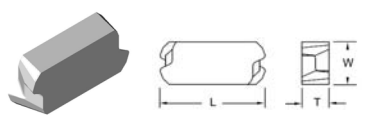
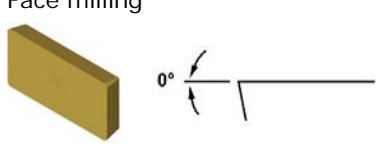
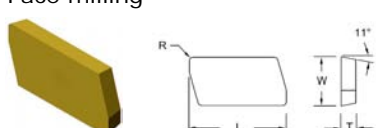
Grade details, see pages 7-9

Nomenclature explanation, see pages 2-3





# Milling Inserts for top clamping systems





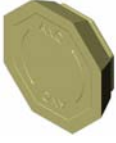



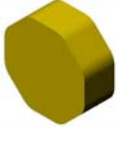

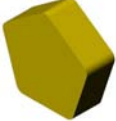

POSITIVE AND NEGATIVE RAKE MILLING for top clamping systems	Part Number	Coated								Uncoated				Dimensions (inches)			
		AN2015	AN2020	AN2035	AN3020	AN3030	AN4040	AN4045	AN2	AN6	AN23	AN28	IC / Length	Thick.	Radius / Flat	Hole	
<b>HNC</b> Face milling Hexagon 	HNC 633							•					•	3/4	3/16	3/64	-
<b>HPC</b> Face milling Hexagon 	HPC 633							•					•	3/4	3/16	3/64	-
<b>LDE</b> Face milling Rectangle 	LDE 6434							•						<b>L</b>	<b>T</b>	<b>R</b>	<b>W</b>
															1	3/16	1/16
<b>LNCX-11</b> Face milling Rectangle 	LNCX 1806AZL-11					•	•		•					<b>L</b>	<b>T</b>	<b>Flat</b>	<b>W</b>
	LNCX 1806AZR-11					•	•		•					.975	1/4	.079	.394
															.975	1/4	.079
<b>LPE</b> Face milling Rectangle 	LPE 5533							•	•					<b>L</b>	<b>T</b>	<b>R</b>	<b>W</b>
															1-1/4	3/16	3/64
<b>LPE-74</b> Face milling Rectangle 	LPE 5533-74							•	•					<b>L</b>	<b>T</b>	<b>R</b>	<b>W</b>
															1-1/4	3/16	3/64

Grade details, see pages 7-9

Nomenclature explanation, see pages 2-3



# Milling Inserts for top clamping systems

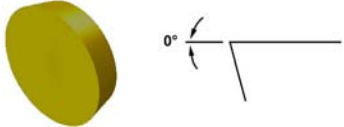
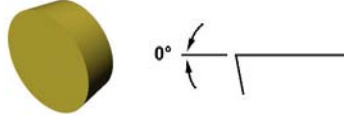
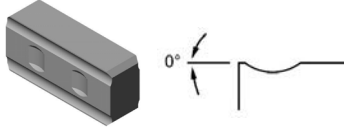
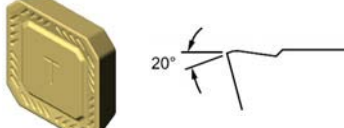
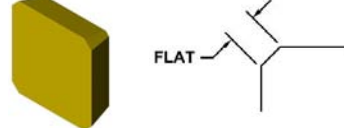

POSITIVE AND NEGATIVE RAKE MILLING for top clamping systems	Part Number	Coated							Uncoated				Dimensions (inches)			
		AN2015	AN2020	AN2035	AN3020	AN3030	AN4040	AN4045	AN2	AN6	AN23	AN28	IC / Length	Thick.	Radius / Flat	Hole
<b>MNC</b> Face milling 	86° Diamond 	MNC 52.52						•				•	5/8	5/32	1/32	-
		MNC 52.54						•					•	5/8	5/32	1/16
<b>NPC</b> Face milling 	87° Diamond 	NPC 633					•						3/4	3/16	3/64	-
<b>OFEN</b> Face milling 	Octagon 	OFEN 070405					•						.706	3/16	.020	-
<b>OFER-13M</b> Face milling 	Octagon 	OFER 070405-13M					•						.706	3/16	.020	-
<b>ONG</b> Face milling 	Octagon 	ONG 436									•	•	1/2	3/16	3/32	-
<b>PNG</b> Face milling 	Pentagon 	PNG 423									•	•	1/2	1/8	3/64	-
		PNG 433										•	•	1/2	3/16	3/64

Grade details, see pages 7-9

Nomenclature explanation, see pages 2-3






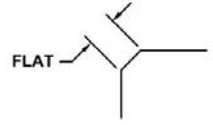

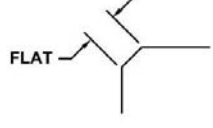

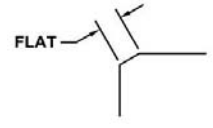

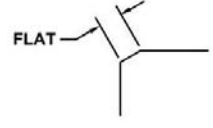


## Milling Inserts for top clamping systems

<b>POSITIVE AND NEGATIVE RAKE MILLING</b> for top clamping systems	Part Number	Coated							Uncoated				Dimensions (inches)				
		AN2015	AN2020	AN2035	AN3020	AN3030	AN4040	AN4045	AN2	AN6	AN23	AN28	IC / Length	Thick.	Radius / Flat	Hole	
<b>RDH</b> Face milling Round 	RDH 63							•	•					3/4	3/16	-	-
<b>RPG</b> Face milling Round 	RPG 32	•	•						•					3/8	1/8	-	-
	RPG 42	•	•						•					1/2	1/8	-	-
	RPG 43	•	•						•					1/2	3/16	-	-
	RPG 63		•						•					3/4	3/16	-	-
	RPG 84		•						•					1	1/4	-	-
<b>S2100</b> Medium milling Rectangle 	S2100									•				1	.296	-	-
<b>SDCR-08</b> Face milling Square 	SDCR 42AESN6-08					•								1/2	1/8	.095	-
<b>SDKN</b> Face milling Square 	SDKN 42A3					•								1/2	1/8	.078	-
	SDKN 53A3					•								5/8	3/16	.078	-
<b>SEAN</b> Face milling Square 	SEAN 42AFTN					•								1/2	1/8	.102	-
	SEAN 53AFTN					•								5/8	3/16	.102	-





# Milling Inserts for top clamping systems


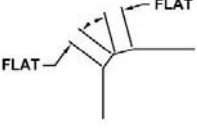

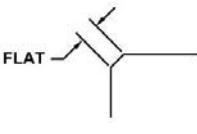

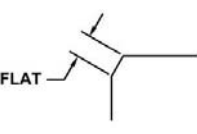

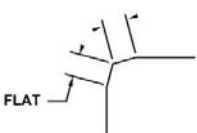

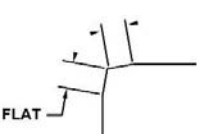

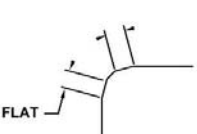
POSITIVE AND NEGATIVE RAKE MILLING for top clamping systems	Part Number	Coated						Uncoated				Dimensions (inches)					
		AN2015	AN2020	AN2035	AN3020	AN3030	AN4040	AN4045	AN2	AN6	AN23	AN28	IC	Thick.	Radius / Flat	Hole	
<b>SEKR-08</b> Face milling  	Square	SEKR 42AFEN6-08				•	•							1/2	1/8	.095	-
<b>SEM</b> Face milling  	Square	SEM 43		•					•					1/2	3/16	.079	-
<b>SHC-A</b> Face milling  	Square	SHC 63A8E							•		•			3/4	3/16	.125	-
<b>SHC-D</b> Face milling  	Square	SHC 63D6R							•		•			3/4	3/16	.094	-
		SHC 63D8L							•		•			3/4	3/16	.125	-
		SHC 63D8R							•		•			3/4	3/16	.125	-
		SHC 63D9L							•		•			3/4	3/16	.141	-
		SHC 63D9R							•		•			3/4	3/16	.141	-
<b>SHC-PD</b> Face milling  	Square	SHC 84PD5R							•		•			1	1/4	.078	-
		SHC 84PD5L							•		•			1	1/4	.078	-
<b>SM</b> Face milling  	Square	SM 10-3-1						•	•					5/16	3/32	1/64	-
		SM 10-3-2						•	•					5/16	3/32	1/32	-

Grade details, see pages 7-9

Nomenclature explanation, see pages 2-3







## Milling Inserts for top clamping systems

POSITIVE AND NEGATIVE RAKE MILLING for top clamping systems		Part Number	Coated						Uncoated				Dimensions (inches)					
			AN2015	AN2020	AN2035	AN3020	AN3030	AN4040	AN4045	AN2	AN6	AN23	AN28	IC	Thick.	Radius / Flat	Hole	
<b>SMK-E</b> Face milling 	Square 	SMK 42E2L				•	•							1/2	1/8	.039/.055	-	
		SMK 42E2R				•	•								1/2	1/8	.039/.055	-
		SMK 43E2L				•	•								1/2	3/16	.039/.055	-
		SMK 43E2R				•	•								1/2	3/16	.039/.055	-
		SMK 53E2L				•	•								5/8	3/16	.039/.055	-
		SMK 53E2R				•	•								5/8	3/16	.039/.055	-
<b>SNC-A</b> Face milling 	Square 	SNC 63A3						•				•		3/4	3/16	.047	-	
<b>SNC-D</b> Face milling 	Square 	SNC 63D6R						•				•		3/4	3/16	.094	-	
		SNC 63D8L							•				•		3/4	3/16	.125	-
		SNC 63D8R							•				•		3/4	3/16	.125	-
<b>SNC-L</b> Face milling 	Square 	SNC 63L8						•				•		3/4	3/16	.125/.125	-	
<b>SNC-U</b> Face milling 	Square 	SNC 63U4						•				•		3/4	3/16	.062/.062	-	
<b>SNC-W</b> Face milling 	Square 	SNC 43W6						•				•		1/2	3/16	.094/.094	-	
		SNC 63W8							•				•		3/4	3/16	.125/.125	-



## Milling Inserts for top clamping systems

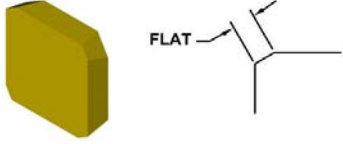
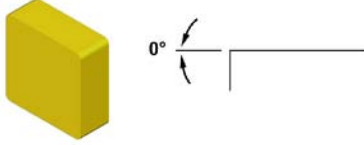
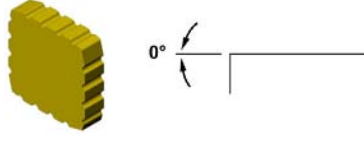
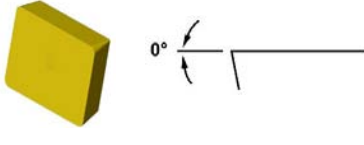
<b>POSITIVE AND NEGATIVE RAKE MILLING</b> for top clamping systems	Part Number	Coated								Uncoated				Dimensions (inches)				
		AN2015	AN2020	AN2035	AN3020	AN3030	AN4040	AN4045	AN2	AN6	AN23	AN28	IC	Thick.	Radius / Flat	Hole		
<b>SNC-Z</b> Face milling 	Square	SNC 63ZN7																
<b>SNE-K</b> Face milling 	Square	SNE 65K4			•													
<b>SNG</b> Face milling 	Square	SNG 321									•	•	3/8	1/8	1/64	-		
		SNG 322									•	•	3/8	1/8	1/32	-		
		SNG 323										•	•	3/8	1/8	3/64	-	
		SNG 332										•	•	3/8	3/16	1/32	-	
		SNG 421										•	•	1/2	1/8	1/64	-	
		SNG 422										•	•	1/2	1/8	1/32	-	
		SNG 423										•	•	1/2	1/8	3/64	-	
		SNG 424										•	•	1/2	1/8	1/16	-	
		SNG 431										•	•	1/2	3/16	1/64	-	
		SNG 432										•	•	1/2	3/16	1/32	-	
		SNG 433										•	•	1/2	3/16	3/64	-	
		SNG 434										•	•	1/2	3/16	1/16	-	
		SNG 438										•	•	1/2	3/16	1/8	-	
		SNG 532							•			•		5/8	3/16	1/32	-	
		SNG 533							•			•		5/8	3/16	3/64	-	
		SNG 534							•			•		5/8	3/16	1/16	-	
		SNG 543							•			•		5/8	1/4	3/64	-	
		SNG 544							•			•		5/8	1/4	1/16	-	
		SNG 631							•			•		3/4	3/16	1/64	-	
		SNG 632							•			•		3/4	3/16	1/32	-	
SNG 633							•			•		3/4	3/16	3/64	-			
SNG 634							•			•		3/4	3/16	1/16	-			
SNG 638							•			•		3/4	3/16	1/8	-			
SNG 843							•			•		1	1/4	3/64	-			
<b>SNK-E</b> Face milling 	Square	SNK 42E2									•	•	1/2	1/8	.055/.039 /.055	-		
		SNK 43E2									•	•	1/2	3/16	.055/.039 /.055	-		
		SNK 53E2									•	•	5/8	3/16	.099/.039 /.099	-		
		SNK 63E3									•	•	3/4	3/16	.099/.039 /.099	-		

Grade details, see pages 7-9

Nomenclature explanation, see pages 2-3



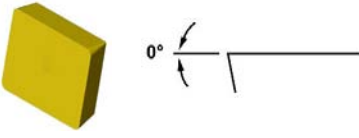
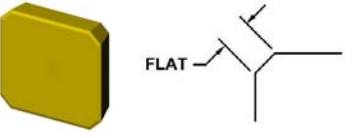
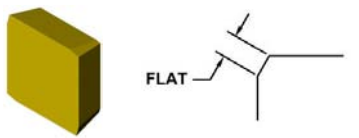
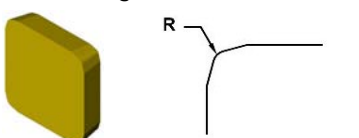
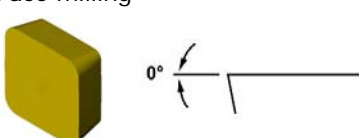
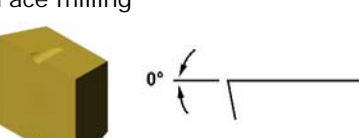
# Milling Inserts for top clamping systems

<b>POSITIVE AND NEGATIVE RAKE MILLING</b> for top clamping systems	Part Number	Coated								Uncoated				Dimensions (inches)					
		AN2015	AN2020	AN2035	AN3020	AN3030	AN4040	AN4045	AN2	AN6	AN23	AN28	IC	Thick.	Radius / Flat	Hole			
<b>SNPC</b> Face milling 	SNPC 63D								•				•	3/4	3/16	.106	-		
	SNU 322												•	•	3/8	1/8	1/32	-	
<b>SNU</b> Face milling 	SNU 422												•	•	1/2	1/8	1/32	-	
	SNU 423													•	•	1/2	1/8	3/64	-
	SNU 424													•	•	1/2	1/8	1/16	-
	SNU 432													•	•	1/2	3/16	1/32	-
	SNU 433													•	•	1/2	3/16	3/64	-
	SNU 434													•	•	1/2	3/16	1/16	-
	SNU 436													•	•	1/2	3/16	3/32	-
	SNU 533						•							•		5/8	3/16	3/64	-
	SNU 543						•							•		5/8	1/4	3/64	-
	SNU 548						•							•		5/8	1/4	1/8	-
	SNU 632						•							•		3/4	3/16	1/32	-
	SNU 633						•							•		3/4	3/16	3/64	-
	SNU 634						•							•		3/4	3/16	1/16	-
	SNU 642						•							•		3/4	1/4	1/32	-
	SNU 643						•							•		3/4	1/4	3/64	-
	SNU 644						•							•		3/4	1/4	1/16	-
	SNU 8512						•							•		1	5/16	3/16	-
	SNU 8612						•							•		1	3/8	3/16	-
SNU 1066						•							•		1-1/4	3/8	3/32	-	
<b>SNUN-RC</b> Rough milling 	SNUN 63LN-RC			•											3/4	3/16	.015	-	
	SNUN 64LN-RC			•												3/4	1/4	.015	-
<b>SPC</b> Face milling 	SPC 321												•	•	3/8	1/8	1/64	-	
	SPC 322													•	•	3/8	1/8	1/32	-
	SPC 422													•	•	1/2	1/8	1/32	-
	SPC 423													•	•	1/2	1/8	3/64	-
	SPC 424													•	•	1/2	1/8	1/16	-
	SPC 432													•	•	1/2	3/16	1/32	-
	SPC 433													•	•	1/2	3/16	3/64	-
	SPC 434													•	•	1/2	3/16	1/16	-
	SPC 533													•	•	5/8	3/16	3/64	-
	SPC 534													•	•	5/8	3/16	1/16	-
	SPC 632													•	•	3/4	3/16	1/32	-
	SPC 633													•	•	3/4	3/16	3/64	-
	SPC 634													•	•	3/4	3/16	1/16	-
	SPC 636													•	•	3/4	3/16	3/32	-

continued on next page



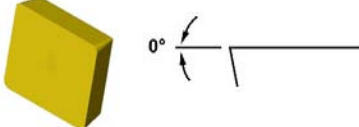
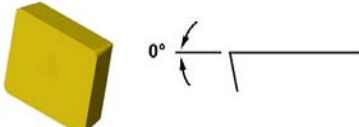
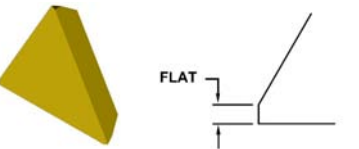
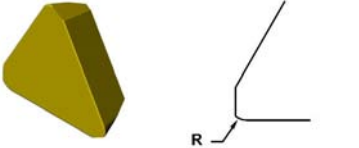
# Milling Inserts for top clamping systems

POSITIVE AND NEGATIVE RAKE MILLING for top clamping systems	Part Number	Coated						Uncoated				Dimensions (inches)				
		AN2015	AN2020	AN2035	AN3020	AN3030	AN4040	AN4045	AN2	AN6	AN23	AN28	IC	Thick.	Radius	Hole
continued from previous page <b>SPC</b> Face milling Square 	SPC 638									•	•	3/4	3/16	1/8	-	
	SPC 6312									•	•	3/4	3/16	3/16	-	
	SPC 843									•	•	1	1/4	3/64	-	
<b>SPC-A</b> Face milling Square 	SPC 84A10			•							•	1	1/4	.154	-	
<b>SPC-E</b> Face milling Square 	SPC 43E4L			•							•	1/2	3/16	.063	-	
	SPC 43E4R			•							•	1/2	3/16	.063	-	
	SPC 43E8R			•							•	1/2	3/16	.125	-	
<b>SPC-L</b> Face milling Square 	SPC 63L4R			•							•	3/4	3/16	.063	-	
<b>SPCN</b> Face milling Square 	SPCN 435SP							•				1/2	3/16	5/64	-	
<b>SPEX</b> Face milling Square 	SPEX 221								•			1/4	1/8	1/64	-	



# Milling Inserts for top clamping systems

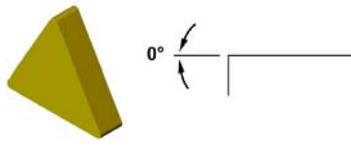
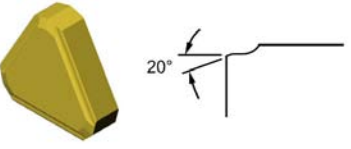
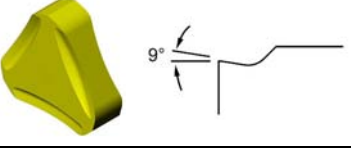
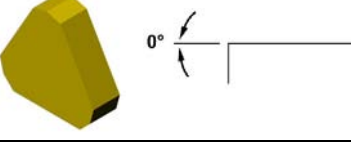
## POSITIVE AND NEGATIVE RAKE MILLING for top clamping systems

	Part Number	Coated								Uncoated				Dimensions (inches)			
		AN2015	AN2020	AN2035	AN3020	AN3030	AN4040	AN4045	AN2	AN6	AN23	AN28	IC	Thick.	Radius / Flat	Hole	
<b>SPG</b> Face milling Square 	SPG 321			•							•		3/8	1/8	1/64	-	
	SPG 322			•							•		3/8	1/8	1/32	-	
	SPG 323			•							•		3/8	1/8	3/64	-	
	SPG 324			•							•		3/8	1/8	1/16	-	
	SPG 421			•							•		1/2	1/8	1/64	-	
	SPG 422			•							•		1/2	1/8	1/32	-	
	SPG 423			•							•		1/2	1/8	3/64	-	
	SPG 424			•							•		1/2	1/8	1/16	-	
	SPG 431			•		•					•		1/2	3/16	1/64	-	
	SPG 432			•		•					•		1/2	3/16	1/32	-	
	SPG 433			•		•					•		1/2	3/16	3/64	-	
	SPG 434			•		•					•		1/2	3/16	1/16	-	
	SPG 532			•		•					•		5/8	3/16	1/32	-	
	SPG 534			•		•					•		5/8	3/16	1/16	-	
	SPG 632			•		•					•		3/4	3/16	1/32	-	
	SPG 633			•		•					•		3/4	3/16	3/64	-	
	SPG 634			•		•					•		3/4	3/16	1/16	-	
	SPG 638			•		•					•		3/4	3/16	1/8	-	
	SPG 838			•		•					•		1	3/16	1/8	-	
	SPG 842			•		•					•		1	1/4	1/32	-	
SPG 843			•		•					•		1	1/4	3/64	-		
<b>SPU</b> Face milling Square 	SPU 422					•				•			1/2	1/8	1/32	-	
	SPU 432					•				•			1/2	3/16	1/32	-	
	SPU 433					•				•			1/2	3/16	3/64	-	
	SPU 532					•				•			5/8	3/16	1/32	-	
	SPU 548					•				•			5/8	1/4	1/8	-	
	SPU 632					•				•			3/4	3/16	1/32	-	
	SPU 633					•				•			3/4	3/16	3/64	-	
	SPU 634					•				•			3/4	3/16	1/16	-	
<b>TEC-P</b> Face milling Triangle 	TEC 43P2R					•							1/2	3/16	.031	-	
<b>TEC-TR</b> Face milling Triangle 	TEC 22TR					•							1/4	1/8	.053	-	
	TEC 32TR					•							3/8	1/8	.071	-	



# Milling Inserts for top clamping systems

## POSITIVE AND NEGATIVE RAKE MILLING for top clamping systems

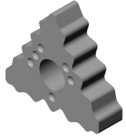


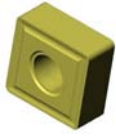

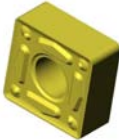
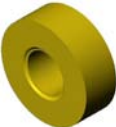
	Part Number	Coated						Uncoated				Dimensions (inches)				
		AN2015	AN2020	AN2035	AN3020	AN3030	AN4040	AN4045	AN2	AN6	AN23	AN28	IC	Thick.	Radius / Flat	Hole
<b>TNG</b> Face milling Triangle 	TNG 221					•							1/4	1/8	1/64	-
	TNG 222					•							1/4	1/8	1/32	-
	TNG 223					•							1/4	1/8	3/64	-
	TNG 224					•							1/4	1/8	1/16	-
	TNG 321					•							3/8	1/8	1/64	-
	TNG 322					•							3/8	1/8	1/32	-
	TNG 323					•							3/8	1/8	3/64	-
	TNG 324					•							3/8	1/8	1/16	-
	TNG 331					•							3/8	3/16	1/64	-
	TNG 332					•							3/8	3/16	1/32	-
	TNG 333					•							3/8	3/16	3/64	-
	TNG 334					•							3/8	3/16	1/16	-
	TNG 431					•							1/2	3/16	1/64	-
	TNG 432					•							1/2	3/16	1/32	-
	TNG 433					•							1/2	3/16	3/64	-
	TNG 434					•							1/2	3/16	1/16	-
	TNG 438					•							1/2	3/16	1/8	-
TNG 544					•							5/8	1/4	1/16	-	
TNG 5412					•							5/8	1/4	3/16	-	
<b>TNHF-GP</b> Automotive milling Triangle 	TNHF 1204AN-GP				•								1/2	3/16	.100/.100	-
<b>TNHF-PC</b> Automotive milling Triangle 	TNHF 1204AN-PC				•								1/2	3/16	.125	-
<b>TNHN</b> Automotive milling Triangle 	TNHN 1204AN				•								1/2	3/16	.100/.100	-



POSITIVE AND NEGATIVE RAKE MILLING for top clamping systems	Part Number	Coated						Uncoated				Dimensions (inches)				
		AN2015	AN2020	AN2035	AN3020	AN3030	AN4040	AN4045	AN2	AN6	AN23	AN28	IC	Thick.	Radius / Flat	Hole
<b>TNU</b> Face milling Triangle 	TNU 222								•		•	1/4	1/8	1/32	-	
	TNU 322								•		•	3/8	1/8	1/32	-	
	TNU 323								•		•	3/8	1/8	3/64	-	
	TNU 332								•		•	3/8	3/16	1/32	-	
	TNU 333								•		•	3/8	3/16	3/64	-	
	TNU 432								•		•	1/2	3/16	1/32	-	
	TNU 433								•		•	1/2	3/16	3/64	-	
	TNU 434								•		•	1/2	3/16	1/16	-	
	TNU 544					•				•			5/8	1/4	1/16	-
	TNU 666					•				•			3/4	3/8	3/32	-
<b>TPC-P</b> Face milling Triangle 	TPC 32P2					•						3/8	1/8	.031	-	
<b>TPG</b> Face milling Triangle 	TPG 221			•					•			1/4	1/8	1/64	-	
	TPG 222			•					•			1/4	1/8	1/32	-	
	TPG 320			•					•			3/8	1/8	.004	-	
	TPG 321			•					•			3/8	1/8	1/64	-	
	TPG 322			•					•			3/8	1/8	1/32	-	
	TPG 323			•					•			3/8	1/8	3/64	-	
	TPG 324			•					•			3/8	1/8	1/16	-	
	TPG 431			•					•			1/2	3/16	1/64	-	
	TPG 432			•					•			1/2	3/16	1/32	-	
	TPG 433			•					•			1/2	3/16	3/64	-	
	TPG 434			•					•			1/2	3/16	1/16	-	
	TPG 438			•					•			1/2	3/16	1/8	-	
	TPG 542			•		•						5/8	1/4	1/32	-	
	TPG 543			•		•						5/8	1/4	3/64	-	
TPG 544			•		•						5/8	1/4	1/16	-		
<b>TPK-P</b> Face milling Triangle 	TPK 32P2R				•	•						3/8	1/8	.039/.039	-	
	TPK 43P2R				•	•						1/2	3/16	.028/.055	-	
<b>TPU</b> Face milling Triangle 	TPU 221					•			•			1/4	1/8	1/64	-	
	TPU 222					•			•			1/4	1/8	1/32	-	
	TPU 321					•			•			3/8	1/8	1/64	-	
	TPU 322					•			•			3/8	1/8	1/32	-	
	TPU 323					•			•			3/8	1/8	3/64	-	
	TPU 432					•			•			1/2	3/16	1/32	-	
	TPU 433					•			•			1/2	3/16	3/64	-	
TPU 434					•			•			1/2	3/16	1/16	-		



**NEGATIVE RAKE BORING**  
for lock pin fastening systems

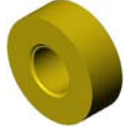
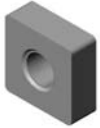

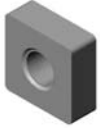
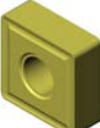

	Part Number	Coated			Uncoated			Dimensions (inches)			
		AN2015	AN2020	AN2025	AN2	AN6	AN28	IC	Thick.	Radius	Hole
<b>3T50</b> Rough boring Triangle 	3T50					•		1/2	3/16	-	.203
	3T50QP					•		1/2	1/4	-	.203
<b>CNMA</b> Medium boring 80° Diamond 	CNMA 432				•			1/2	3/16	1/32	.203
	CNMA 433				•			1/2	3/16	3/64	.203
<b>CNMA-KR</b> Rough boring 80° Diamond 	CNMA 432-KR	•						1/2	3/16	1/32	.203
	CNMA 433-KR	•						1/2	3/16	3/64	.203
	CNMA 542-KR	•						5/8	1/4	1/32	.250
	CNMA 543-KR	•						5/8	1/4	3/64	.250
	CNMA 642-KR	•						3/4	1/4	1/32	.312
	CNMA 643-KR	•						3/4	1/4	3/64	.312
	CNMA 644-KR	•						3/4	1/4	1/16	.312
<b>CNMG-GM</b> Medium boring 80° Diamond 	CNMG 431-GM	•	•					1/2	3/16	1/64	.203
	CNMG 432-GM	•	•					1/2	3/16	1/32	.203
	CNMG 433-GM	•	•					1/2	3/16	3/64	.203
	CNMG 542-GM	•	•					5/8	1/4	1/32	.250
	CNMG 543-GM	•	•					5/8	1/4	3/64	.250
	CNMG 642-GM	•	•					3/4	1/4	1/32	.312
	CNMG 643-GM	•	•					3/4	1/4	3/64	.312
	CNMG 644-GM	•	•					3/4	1/4	1/16	.312
<b>CNMG-LR</b> Light rough boring 80° Diamond 	CNMG 432-LR	•	•					1/2	3/16	1/32	.203
	CNMG 433-LR	•	•					1/2	3/16	3/64	.203
	CNMG 434-LR	•	•					1/2	3/16	1/16	.203
	CNMG 543-LR	•	•					5/8	1/4	3/64	.250
	CNMG 643-LR	•	•					3/4	1/4	3/64	.312
	CNMG 644-LR	•	•					3/4	1/4	1/16	.312
	CNMG 646-LR	•	•					3/4	1/4	3/32	.312
<b>CNMG-MM</b> Medium boring 80° Diamond 	CNMG 432-MM			•				1/2	3/16	1/32	.203
	CNMG 433-MM			•				1/2	3/16	3/64	.203
	CNMG 542-MM			•				5/8	1/4	1/32	.250
	CNMG 543-MM			•				5/8	1/4	3/64	.250
	CNMG 642-MM			•				3/4	1/4	1/32	.312
	CNMG 643-MM			•				3/4	1/4	3/64	.312
<b>RNMA</b> Medium boring Round 	RNMA 32				•			3/8	1/8	-	.150
	RNMA 43				•			1/2	3/16	-	.203
	RNMA 44				•			1/2	1/4	-	.203

Grade details, see pages 7-9

Nomenclature explanation, see pages 2-3

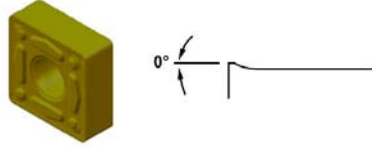
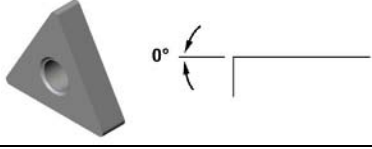
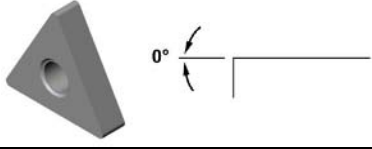
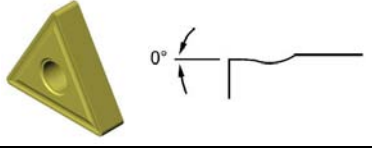
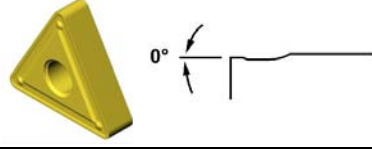
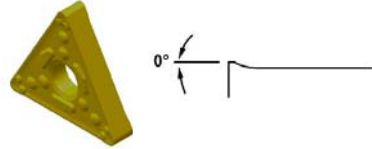


**NEGATIVE RAKE BORING**  
for lock pin fastening systems

	Part Number	Coated			Uncoated			Dimensions (inches)			
		AN2015	AN2020	AN2025	AN2	AN6	AN28	IC	Thick.	Radius	Hole
<b>RNMA-KR</b> Rough boring Round 	RNMA 43-KR	•						1/2	3/16	-	.203
	RNMA 44-KR	•						1/2	1/4	-	.203
	RNMA 64-KR	•						3/4	1/4	-	.312
	RNMA 84-KR	•						1	1/4	-	.358
	RNMA 86-KR	•						1	3/8	-	.358
	RNMA 106-KR	•						1-1/4	3/8	-	.503
<b>SNEA</b> Rough boring Square 	SNEA 322					•	•	3/8	1/8	1/32	.150
	SNEA 432					•	•	1/2	3/16	1/32	.203
	SNEA 433					•	•	1/2	3/16	3/64	.203
	SNEA 543					•	•	5/8	1/4	3/64	.250
<b>SNMA</b> Medium boring Square 	SNMA 432				•			1/2	3/16	1/32	.203
	SNMA 433				•			1/2	3/16	3/64	.203
	SNMA 434				•			1/2	3/16	1/16	.203
<b>SNMA-KR</b> Rough boring Square 	SNMA 432-KR	•						1/2	3/16	1/32	.203
	SNMA 433-KR	•						1/2	3/16	3/64	.203
	SNMA 434-KR	•						1/2	3/16	1/16	.203
	SNMA 543-KR	•						5/8	1/4	3/64	.250
	SNMA 548-KR	•						5/8	1/4	1/8	.250
<b>SNMG-GM</b> Medium boring Square 	SNMG 432-GM	•	•					1/2	3/16	1/32	.203
	SNMG 433-GM	•	•					1/2	3/16	3/64	.203
	SNMG 434-GM	•	•					1/2	3/16	1/16	.203
	SNMG 543-GM	•	•					5/8	1/4	3/64	.250
	SNMG 544-GM	•	•					5/8	1/4	1/16	.250
<b>SNMG-LR</b> Light rough boring Square 	SNMG 432-LR	•	•					1/2	3/16	1/32	.203
	SNMG 543-LR	•	•					5/8	1/4	3/64	.250



**NEGATIVE RAKE BORING**  
for lock pin fastening systems

	Part Number	Coated			Uncoated			Dimensions (inches)			
		AN2015	AN2020	AN2025	AN2	AN6	AN28	IC	Thick.	Radius	Hole
<b>SNMG-MM</b> Medium boring Square 	SNMG 432-MM			•				1/2	3/16	1/32	.203
<b>TNMA</b> Medium boring Triangle 	TNMA 432				•			1/2	3/16	1/32	.203
	TNMA 433				•			1/2	3/16	3/64	.203
	TNMA 434				•			1/2	3/16	1/16	.203
<b>TNMA-KR</b> Rough boring Triangle 	TNMA 432-KR	•						1/2	3/16	1/32	.203
	TNMA 433-KR	•						1/2	3/16	3/64	.203
	TNMA 434-KR	•						1/2	3/16	1/16	.203
	TNMA 436-KR	•						1/2	3/16	3/32	.203
	TNMA 438-KR	•						1/2	3/16	1/8	.203
<b>TNMG-GM</b> Medium boring Triangle 	TNMG 431-GM	•	•					1/2	3/16	1/64	.203
	TNMG 432-GM	•	•					1/2	3/16	1/32	.203
	TNMG 433-GM	•	•					1/2	3/16	3/64	.203
	TNMG 434-GM	•	•					1/2	3/16	1/16	.203
<b>TNMG-LR</b> Light rough boring Triangle 	TNMG 432-LR	•	•					1/2	3/16	1/32	.203
	TNMG 433-LR	•	•					1/2	3/16	3/64	.203
<b>TNMG-MM</b> Medium boring Triangle 	TNMG 432-MM			•				1/2	3/16	1/32	.203



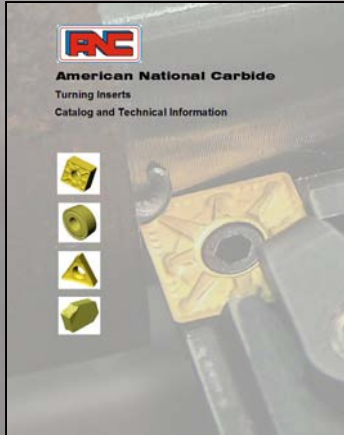
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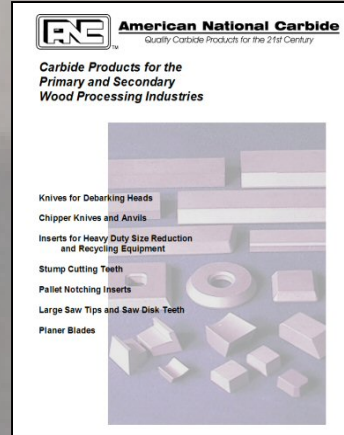
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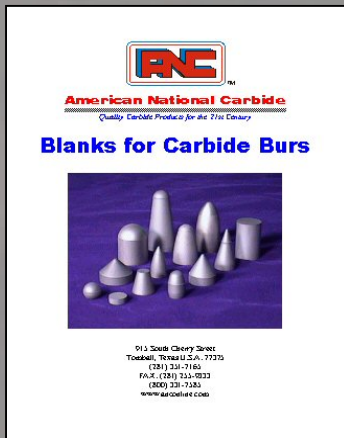
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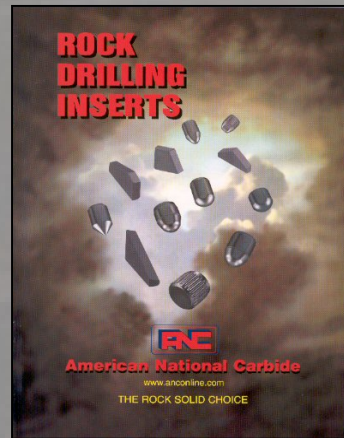
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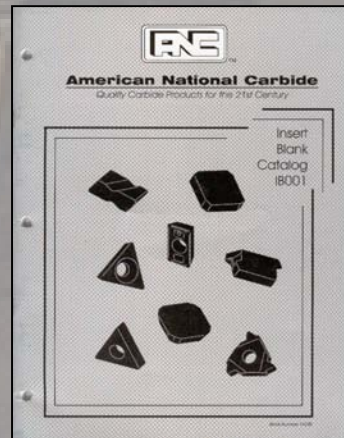
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