MILLSTAR® CANADA

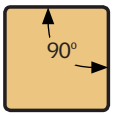
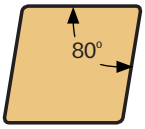
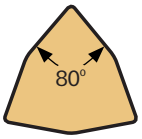
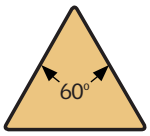
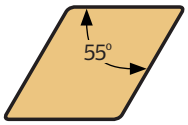
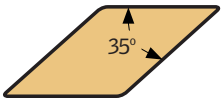
Total Carbide Insert Solutions

Grooving

Milling

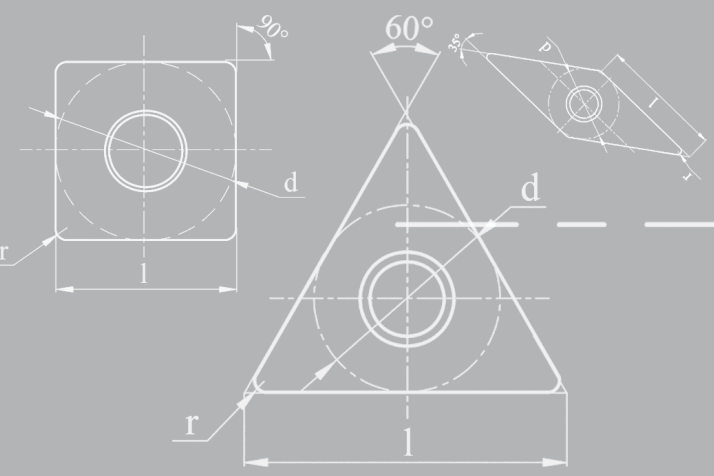
Turning

Threading

Insert Shape	Application Conditions (+)	Considerations (-)
 **S** - Square	• Very strong 90° corner with excellent economy (8 edges on double-sided inserts). • Most often used for rough facing operations – especially on castings, forgings and rough-sawed blanks.	• Unable to turn or face up to a shoulder (must be used in a toolholder with minimum 5° lead angle). • High radial forces push against the workpiece when used for turning. • Should always be used in a stable set-up.
 **C** - 80° Diamond	• The most popular insert shape due to high versatility. • Strong cutting edge with secure seating in the insert pocket. • 80° corner can be used for both turning and facing operations. • Opposite 100° corners can be used for general roughing applications (especially facing), providing maximum economy of 8 total cutting edges.	• With only 5° of clearance between the trailing side of the insert and the workpiece, chip jamming can occur when boring.
 **W** - 80° Corner Trigon	• Six-corner 80° diamond shape that can increase economy compared to CNMG-style inserts. • Generally used on more moderate depths of cut and feedrates than CNMG-style inserts.	• Seating of insert in pocket is not as stable as CNMG-style inserts. • Cannot take as deep a depth of cut as similar sized CNMG-type inserts.
 **T** - Triangle	• Very versatile insert shape – can be used for turning, facing, boring, copy turning and basic profiling. • Good economy with up to 6 cutting edges. • Excellent choice for general boring due to very stable seating of the insert in the boring bar pocket, and extra side clearance between the insert and the workpiece bore (greatly reducing the risk of chip jamming).	• Edge is measurably weaker than 80° diamond shaped inserts. • Be sure not to use a triangle insert that is "too large" for the application, as the cost per edge can increase. For example, a 3/8" iC (Inscribed Circle) triangle insert (TNMG-33x) can manage up to .375" depth of cut in most situations with nearly the same insert strength – but a much lower cost - than a 1/2" iC triangle insert (TNMG-43x).
 **D** - 55° Diamond	• Generally the first choice for profile / copy turning applications. • Able to "In-Copy" (plunge turn into a smaller diameter) at an angle of 30°. • Commonly used when machining close to the tailstock / live center.	• Somewhat weaker edge strength than a triangle insert. • Cost per edge is higher than most other turning inserts (except 35° diamond shape).
 **V** - 35° Diamond	• First choice for intricate shape copy turning. • Can "In-Copy" (plunge turn into a smaller diameter) at an angle up to 49°. • Can work extremely close to the tailstock / live center.	• The weakest turning insert shape / corner – depths of cut and feedrates must be lighter. • Highest cost per edge. • Negative style (VNMG) should mainly be used for external applications. • Positive style (VCMT) can be used for external and internal applications, and in many cases improved performance outweighs the increased cost per edge (2 edges vs. the 4 edges of a negative 35° diamond VNMG).

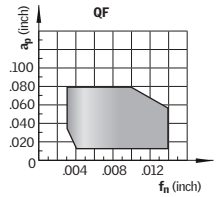
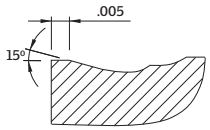
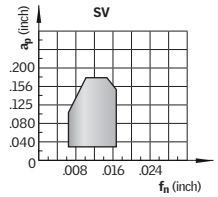
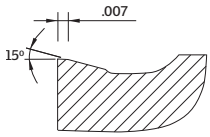
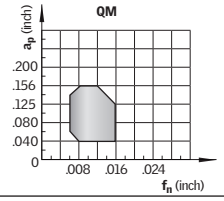
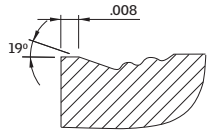
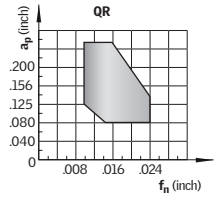
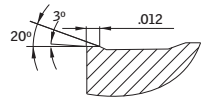
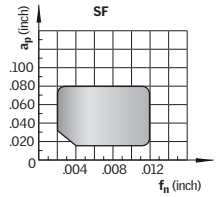
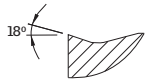
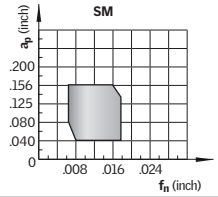
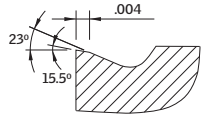
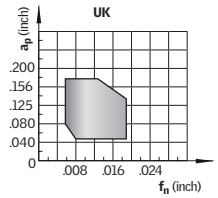
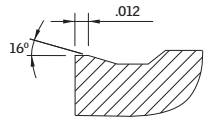
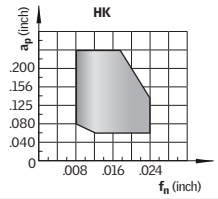
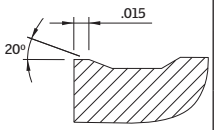
TURNING INSERTS | NEGATIVE RAKE

ANSI / ISO STANDARD INSERTS
FOR MOST EXTERNAL TURNING AND
INTERNAL MACHINING OPERATIONS

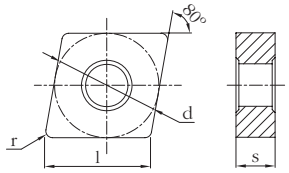


WORKPIECE MATERIAL	ANSI	ISO	Coating Type		
			CVD	PVD	
P Steel	C8 C7 C6	01 10 20 30 40	GP1105 GP1115 GP1225 GP1135		wear resistance toughness
M Stainless Steel	– – – –	01 10 20 30	GM1125	GS3115 GM3125	wear resistance toughness
K Cast Iron	C4 C3 C2 C1	01 10 20 30	GK1115 GK1125		wear resistance toughness
	– – – –	01 10 20 30			wear resistance toughness

See pages 68 and 69 for more information on grades for turning.

Chipbreaker	Description	Chipbreaker Range	Design
QF P STEEL	• Butterfly geometry directs chip flow • Variable Rake Angle • Curved Edgeline • Excellent chip control at small depths of cut • High quality surface finish		
SV P STEEL	• Super-wide Chipgroove • High positive cutting action • Unique cutting edge treatment • Extremely long edgeline • Good for unstable set-ups • Able to handle varying depths of cut		
QM P STEEL	• Smooth chip formation • Variable Land balances sharpness & strength • Strengthening ribs extend tool life • Wide application range • Low cutting forces with high edge strength • Excellent all-around performance		
QR P STEEL	• High performance steel roughing chipbreaker • Strong cutting edge • Well suited for unstable application conditions • First choice for medium to heavy interruptions • Excellent chip evacuation and chip control • Smooth chip removal throughout feed range		
SF M STAINLESS STEEL	• Ultra-sharp cutting edge • Low cutting forces • Excellent chip control at small depths of cut • Top land design protects against edge hammering • Smooth cutting action without burrs • Excellent workpiece surface finish		
SM M STAINLESS STEEL	• Double-positive chipbreaker design • Strengthened positive land • Micro-edge geometry for Stainless Steel • Reduced workhardening effect • Wide application range / medium turning		
UK K CAST IRON	• Lower cutting force geometry for Cast Iron • Strengthened edgeline with open chipformer • Designed for light to moderate applications • Good choice in unstable set-ups • Problem solver for boring Cast Iron		
HK K CAST IRON	• Outstanding performance in Cast Iron • Strong edge with free cutting action • Extremely broad application range • Replaces traditional – NMA flat-top inserts • Precision lapped support surface		

CNMG-QF



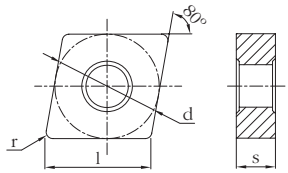
Most popular shape / style of insert. All-purpose turning, facing and boring.

QF: First Choice Geometry for finishing and semi-finishing applications in all types of Steel.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1105	GP1115	GP1225	
CNMG 321-QF	CNMG 090304-QF	3/8	.381	1/8	1/64	.010 - .062	.003 - .010		★	★	
CNMG 322-QF	CNMG 090308-QF	3/8	.381	1/8	1/32	.016 - .080	.004 - .014		★	★	
CNMG 431-QF	CNMG 120404-QF	1/2	.508	3/16	1/64	.010 - .062	.003 - .010	★	★	★	
CNMG 432-QF	CNMG 120408-QF	1/2	.508	3/16	1/32	.016 - .080	.004 - .014	★	★	★	

Ordering Example: 20 pcs CNMG 432-QF GP1225

CNMG-SV



Most popular shape / style of insert. All-purpose turning, facing and boring.

SV: Sharp Edge Geometry for shaft turning, boring and unstable workpieces. Performs well in a wide range of depths of cut.

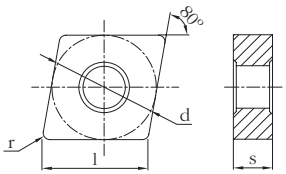
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1225			
CNMG 432R-SV	CNMG 120408R-SV	1/2	.508	3/16	1/32	.031 - .187	.004 - .018	★			
CNMG 432L-SV	CNMG 120408L-SV	1/2	.508	3/16	1/32	.031 - .187	.004 - .018	★			

Ordering Example: 20 pcs CNMG 432L-SV GP1225

NOTE: SV geometry inserts are available in both R (Right-hand) and L (Left-hand) styles. Right-hand style is shown above.
Normal External Turning applications require Right-hand (R) inserts in Right-hand holders, and Left-hand (L) inserts in Left-hand holders.
For Internal / Boring applications, Left-hand (L) inserts are used in Right-hand bars, and Right-hand (R) inserts are used in Left-hand bars.

REFERENCE PAGES					
GRADE SELECTION GUIDE	6	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

CNMG-QM



Most popular shape / style of insert. All-purpose turning, facing and boring.

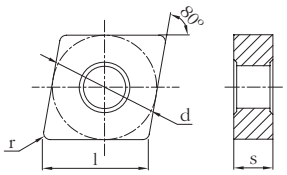
QM: First Choice Geometry for medium to semi-roughing applications in all types of Steel.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1105	GP1115	GP1225	
CNMG 321-QM	CNMG 090304-QM	3/8	.381	1/8	1/64	.016 - .141	.004 - .012		★	★	
CNMG 322-QM	CNMG 090308-QM	3/8	.381	1/8	1/32	.020 - .141	.005 - .016		★	★	
CNMG 431-QM	CNMG 120404-QM	1/2	.508	3/16	1/64	.016 - .187	.004 - .012	★	★	★	
CNMG 432-QM	CNMG 120408-QM	1/2	.508	3/16	1/32	.020 - .187	.005 - .016	★	★	★	
CNMG 433-QM	CNMG 120412-QM	1/2	.508	3/16	3/64	.031 - .187	.006 - .020	★	★	★	
CNMG 434-QM	CNMG 120416-QM	1/2	.508	3/16	1/16	.040 - .187	.007 - .024			★	
CNMG 542-QM	CNMG 160608-QM	5/8	.635	1/4	1/32	.020 - .219	.005 - .016	★	★	★	
CNMG 543-QM	CNMG 160612-QM	5/8	.635	1/4	3/64	.031 - .219	.006 - .020	★	★	★	
CNMG 642-QM	CNMG 190608-QM	3/4	.762	1/4	1/32	.020 - .266	.005 - .016		★	★	
CNMG 643-QM	CNMG 190612-QM	3/4	.762	1/4	3/64	.031 - .266	.006 - .020	★	★	★	
CNMG 644-QM	CNMG 190616-QM	3/4	.762	1/4	1/16	.040 - .266	.007 - .024			★	

Ordering Example: 20 pcs CNMG 644-QM GP1225

REFERENCE PAGES					
GRADE SELECTION GUIDE	6	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

CNMG-QR



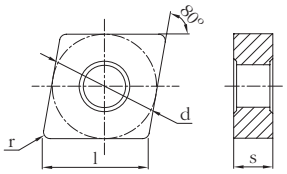
Most popular shape / style of insert. All-purpose turning, facing and boring.

QR: Strong cutting edge geometry for roughing applications in all types of Steel. Well suited for unstable conditions and interrupted cuts.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1105	GP1115	GP1225	GP1135
CNMG 432-QR	CNMG 120408-QR	1/2	.508	3/16	1/32	.028 - .219	.007 - .020	★	★	★	★
CNMG 433-QR	CNMG 120412-QR	1/2	.508	3/16	3/64	.040 - .219	.008 - .022	★	★	★	★
CNMG 543-QR	CNMG 160612-QR	5/8	.635	1/4	3/64	.040 - .266	.008 - .022	★	★	★	★
CNMG 544-QR	CNMG 160616-QR	5/8	.635	1/4	1/16	.055 - .266	.009 - .026	★	★		★
CNMG 643-QR	CNMG 190612-QR	3/4	.762	1/4	3/64	.040 - .328	.008 - .022	★	★	★	★
CNMG 644-QR	CNMG 190616-QR	3/4	.762	1/4	1/16	.055 - .328	.009 - .026	★	★		★

Ordering Example: 20 pcs CNMG 644-QR GP1135

CNMG-SF



Most popular shape / style of insert. All-purpose turning, facing and boring.

SF: Ultra-sharp cutting edge geometry for finishing in Stainless Steels. Low cutting forces and superior workpiece surface finish without burrs.

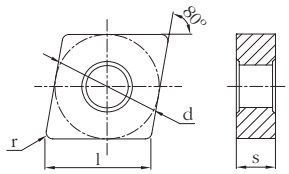
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STAINLESS STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GS3115			
CNMG 431-SF	CNMG 120404-SF	1/2	.508	3/16	1/64	.004 - .062	.003 - .012	★			
CNMG 432-SF	CNMG 120408-SF	1/2	.508	3/16	1/32	.004 - .062	.004 - .016	★			

Ordering Example: 20 pcs CNMG 432-SF GS3115

NOTE: The primary application area for grade GS3115 is in stainless steel workpiece materials. GS3115 is also suitable for use with iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys.

REFERENCE PAGES					
GRADE SELECTION GUIDE	6	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

CNMG-SM



Most popular shape / style of insert. All-purpose turning, facing and boring.

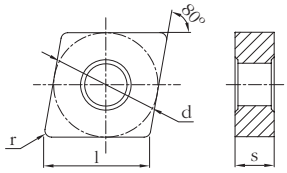
SM: Keen edge geometry especially for Stainless Steel. Unique edgeline reduces work hardening. Semi-finishing to rough machining.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STAINLESS STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GM1125	GM3125		
CNMG 321-SM	CNMG 090304-SM	3/8	.381	1/8	1/64	.016 - .141	.004 - .012	★	★		
CNMG 322-SM	CNMG 090308-SM	3/8	.381	1/8	1/32	.020 - .141	.005 - .016	★	★		
CNMG 431-SM	CNMG 120404-SM	1/2	.508	3/16	1/64	.016 - .187	.004 - .012	★	★		
CNMG 432-SM	CNMG 120408-SM	1/2	.508	3/16	1/32	.020 - .187	.005 - .016	★	★		
CNMG 433-SM	CNMG 120412-SM	1/2	.508	3/16	3/64	.031 - .187	.006 - .020	★	★		
CNMG 434-SM	CNMG 120416-SM	1/2	.508	3/16	1/16	.040 - .187	.007 - .024	★	★		
CNMG 542-SM	CNMG 160608-SM	5/8	.635	1/4	1/32	.020 - .219	.005 - .016	★	★		
CNMG 543-SM	CNMG 160612-SM	5/8	.635	1/4	3/64	.031 - .219	.006 - .020	★	★		
CNMG 544-SM	CNMG 160616-SM	5/8	.635	1/4	1/16	.040 - .219	.007 - .024	★	★		
CNMG 642-SM	CNMG 190608-SM	3/4	.762	1/4	1/32	.020 - .266	.005 - .016	★	★		
CNMG 643-SM	CNMG 190612-SM	3/4	.762	1/4	3/64	.031 - .266	.006 - .020	★	★		
CNMG 644-SM	CNMG 190616-SM	3/4	.762	1/4	1/16	.040 - .266	.007 - .024	★	★		

Ordering Example: 20 pcs CNMG 644-SM GM1125

REFERENCE PAGES					
GRADE SELECTION GUIDE	6	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

CNMG-UK



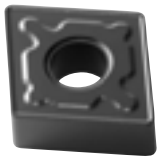
Most popular shape / style of insert. All-purpose turning, facing and boring.

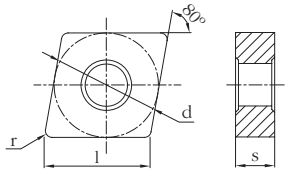
UK: Lower cutting force geometry for Cast Iron. Edge geometry reduces cutting forces in moderate conditions / lighter cuts.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		CAST IRON			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GK1115	GK1125		
CNMG 431-UK	CNMG 120404-UK	1/2	.508	3/16	1/64	.012 - .203	.003 - .012	★	★		
CNMG 432-UK	CNMG 120408-UK	1/2	.508	3/16	1/32	.016 - .203	.004 - .014	★	★		

Ordering Example: 20 pcs CNMG 432-UK GK1115

CNMG-HK





Most popular shape / style of insert. All-purpose turning, facing and boring.

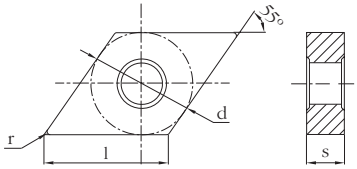
HK: Exceptionally broad application range geometry primarily for Cast Iron. Strong cutting edge, excellent durability. Semi-finishing to roughing.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		CAST IRON			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GK1115	GK1125		
CNMG 432-HK	CNMG 120408-HK	1/2	.508	3/16	1/32	.020 - .219	.004 - .016	★	★		
CNMG 433-HK	CNMG 120412-HK	1/2	.508	3/16	3/64	.031 - .219	.006 - .020	★	★		
CNMG 543-HK	CNMG 160612-HK	5/8	.635	1/4	3/64	.031 - .297	.006 - .020	★	★		
CNMG 544-HK	CNMG 160616-HK	5/8	.635	1/4	1/16	.040 - .297	.008 - .026		★		
CNMG 643-HK	CNMG 190612-HK	3/4	.762	1/4	3/64	.031 - .359	.006 - .020	★	★		
CNMG 644-HK	CNMG 190616-HK	3/4	.762	1/4	1/16	.040 - .359	.008 - .026		★		

Ordering Example: 20 pcs CNMG 644-HK GK1125

REFERENCE PAGES					
GRADE SELECTION GUIDE	6	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

DNMG-QF



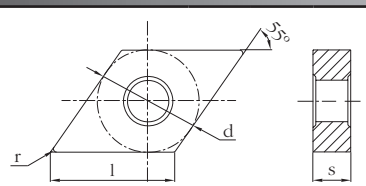
Use for profile turning, copy turning, and semi-finishing. Can turn more complex shapes due to 55° included angle.

QF: First Choice Geometry for finishing and semi-finishing applications in all types of Steel.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1105	GP1115	GP1225	
DNMG 331-QF	DNMG 110404-QF	3/8	.458	3/16	1/64	.010 - .062	.003 - .010		★	★	
DNMG 332-QF	DNMG 110408-QF	3/8	.458	3/16	1/32	.016 - .080	.004 - .014		★	★	
DNMG 431-QF	DNMG 150404-QF	1/2	.610	3/16	1/64	.010 - .062	.003 - .010	★	★	★	
DNMG 432-QF	DNMG 150408-QF	1/2	.610	3/16	1/32	.016 - .080	.004 - .014	★	★	★	

Ordering Example: 20 pcs DNMG 432-QF GP1115

DNMG-QM



Use for profile turning, copy turning, and semi-finishing. Can turn more complex shapes due to 55° included angle.

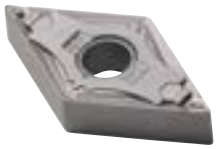
QM: First Choice Geometry for medium to semi-roughing applications in all types of Steel.

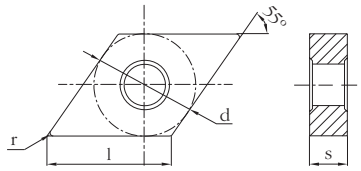
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1105	GP1115	GP1225	
DNMG 331-QM	DNMG 110404-QM	3/8	.458	3/16	1/64	.016 - .156	.004 - .012		★	★	
DNMG 332-QM	DNMG 110408-QM	3/8	.458	3/16	1/32	.020 - .156	.005 - .016		★	★	
DNMG 333-QM	DNMG 110412-QM	3/8	.458	3/16	3/64	.031 - .156	.006 - .020		★	★	
DNMG 431-QM	DNMG 150404-QM	1/2	.610	3/16	1/64	.016 - .187	.004 - .012	★	★	★	
DNMG 432-QM	DNMG 150408-QM	1/2	.610	3/16	1/32	.020 - .187	.005 - .016	★	★	★	
DNMG 433-QM	DNMG 150412-QM	1/2	.610	3/16	3/64	.031 - .187	.006 - .020		★	★	

Ordering Example: 20 pcs DNMG 433-QM GP1115

REFERENCE PAGES					
GRADE SELECTION GUIDE	6	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

DNMG-SF





Use for profile turning, copy turning, and semi-finishing. Can turn more complex shapes due to 55° included angle.

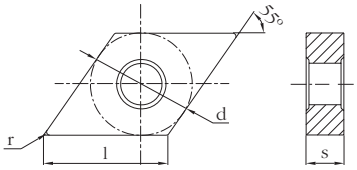
SF: Ultra-sharp cutting edge geometry for finishing in Stainless Steels. Low cutting forces and superior workpiece surface finish without burrs.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STAINLESS STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GS3115			
DNMG 431-SF	DNMG 150404-SF	1/2	.610	3/16	1/64	.004 - .062	.003 - .012	★			
DNMG 432-SF	DNMG 150408-SF	1/2	.610	3/16	1/32	.004 - .062	.004 - .016	★			

Ordering Example: 20 pcs DNMG 432-SF GS3115

NOTE: The primary application area for grade GS3115 is in stainless steel workpiece materials. GS3115 is also suitable for use with iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys.

DNMG-SM



Use for profile turning, copy turning, and semi-finishing. Can turn more complex shapes due to 55° included angle.

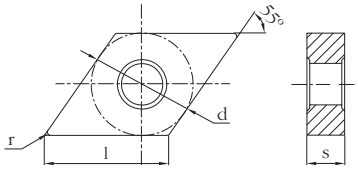
SM: Keen edge geometry especially for Stainless Steel. Unique edgeline reduces work hardening. Semi-finishing to rough machining.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STAINLESS STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GM1125	GM3125		
DNMG 331-SM	DNMG 110404-SM	3/8	.458	3/16	1/64	.016 - .156	.004 - .012	★			
DNMG 332-SM	DNMG 110408-SM	3/8	.458	3/16	1/32	.020 - .156	.005 - .016	★	★		
DNMG 333-SM	DNMG 110412-SM	3/8	.458	3/16	3/64	.031 - .156	.006 - .020	★	★		
DNMG 431-SM	DNMG 150404-SM	1/2	.610	3/16	1/64	.016 - .187	.004 - .012	★	★		
DNMG 432-SM	DNMG 150408-SM	1/2	.610	3/16	1/32	.020 - .187	.005 - .016	★	★		
DNMG 433-SM	DNMG 150412-SM	1/2	.610	3/16	3/64	.031 - .187	.006 - .020	★	★		

Ordering Example: 20 pcs DNMG 433-SM GM1125

REFERENCE PAGES					
GRADE SELECTION GUIDE	6	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

DNMG-UK



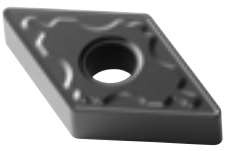
Use for profile turning, copy turning, and semi-finishing. Can turn more complex shapes due to 55° included angle.

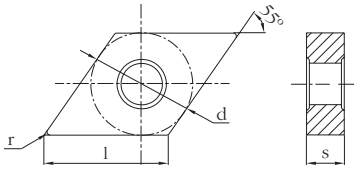
UK: Lower cutting force geometry for Cast Iron. Edge geometry reduces cutting forces in moderate conditions / lighter cuts.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		CAST IRON			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GK1115	GK1125		
DNMG 431-UK	DNMG 150404-UK	1/2	.610	3/16	1/64	.012 - .203	.003 - .012	★	★		
DNMG 432-UK	DNMG 150408-UK	1/2	.610	3/16	1/32	.016 - .203	.004 - .014	★	★		

Ordering Example: 20 pcs DNMG 432-UK GK1115

DNMG-HK





Use for profile turning, copy turning, and semi-finishing. Can turn more complex shapes due to 55° included angle.

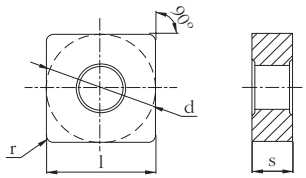
HK: Exceptionally broad application range geometry primarily for Cast Iron. Strong cutting edge, excellent durability. Semi-finishing to roughing.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		CAST IRON			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GK1115	GK1125		
DNMG 432-HK	DNMG 150408-HK	1/2	.610	3/16	1/32	.020 - .219	.004 - .016	★	★		
DNMG 433-HK	DNMG 150412-HK	1/2	.610	3/16	3/64	.031 - .219	.006 - .020	★	★		

Ordering Example: 20 pcs DNMG 433-HK GK1115

REFERENCE PAGES					
GRADE SELECTION GUIDE	6	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

SNMG-QF



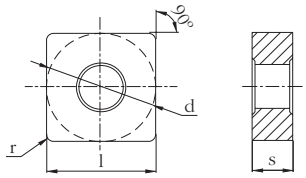
Excellent economy due to 8 cutting edges. Strong insert shape. Mainly for rough facing and chamfering (not turning to a shoulder).

QF: First Choice Geometry for finishing and semi-finishing applications in all types of Steel.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1105	GP1115	GP1225	
SNMG 321-QF	SNMG 090304-QF	3/8	.375	1/8	1/64	.010 - .062	.003 - .010		★	★	
SNMG 322-QF	SNMG 090308-QF	3/8	.375	1/8	1/32	.016 - .080	.004 - .014		★	★	
SNMG 431-QF	SNMG 120404-QF	1/2	.500	3/16	1/64	.010 - .062	.003 - .010	★	★	★	
SNMG 432-QF	SNMG 120408-QF	1/2	.500	3/16	1/32	.016 - .080	.004 - .014	★	★	★	

Ordering Example: 20 pcs SNMG 432-QF GP1105

SNMG-SV



Excellent economy due to 8 cutting edges. Strong insert shape. Mainly for rough facing and chamfering (not turning to a shoulder).

SV: Sharp Edge Geometry for turning and facing unstable workpieces. Can handle a wide range of depths of cut.

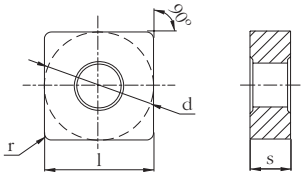
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1225			
SNMG 432R-SV	SNMG 120408R-SV	1/2	.500	3/16	1/32	.031 - .187	.004 - .018	★			
SNMG 432L-SV	SNMG 120408L-SV	1/2	.500	3/16	1/32	.031 - .187	.004 - .018	★			

Ordering Example: 20 pcs SNMG 432L-SV GP1225

NOTE: SV geometry inserts are available in both R (Right-hand) and L (left-hand) styles. Right-hand style is shown above.
Normal External Turning applications require Right-hand (R) inserts in Right-hand holders, and Left-hand (L) inserts in Left-hand holders.
For Internal / Boring applications, Left-hand (L) inserts are used in Right-hand bars, and Right-hand (R) inserts are used in Left-hand bars.

REFERENCE PAGES					
GRADE SELECTION GUIDE	6	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

SNMG-QM



Excellent economy due to 8 cutting edges. Strong insert shape. Mainly for rough facing and chamfering (not turning to a shoulder).

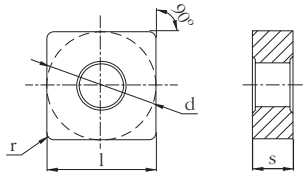
QM: First Choice Geometry for medium to semi-roughing applications in all types of Steel.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1105	GP1115	GP1225	
SNMG 321-QM	SNMG 090304-QM	3/8	.375	1/8	1/64	.016 - .141	.004 - .012		★	★	
SNMG 322-QM	SNMG 090308-QM	3/8	.375	1/8	1/32	.020 - .141	.005 - .016		★	★	
SNMG 431-QM	SNMG 120404-QM	1/2	.500	3/16	1/64	.016 - .187	.004 - .012		★	★	
SNMG 432-QM	SNMG 120408-QM	1/2	.500	3/16	1/32	.020 - .187	.005 - .016	★	★	★	
SNMG 433-QM	SNMG 120412-QM	1/2	.500	3/16	3/64	.031 - .187	.006 - .020	★	★	★	
SNMG 434-QM	SNMG 120416-QM	1/2	.500	3/16	1/16	.040 - .187	.007 - .024			★	
SNMG 542-QM	SNMG 150608-QM	5/8	.625	1/4	1/32	.020 - .219	.005 - .016		★	★	
SNMG 543-QM	SNMG 150612-QM	5/8	.625	1/4	3/64	.031 - .219	.006 - .020	★	★	★	
SNMG 643-QM	SNMG 190612-QM	3/4	.750	1/4	3/64	.031 - .266	.006 - .020	★	★	★	

Ordering Example: 20 pcs SNMG 643-QM GP1115

REFERENCE PAGES					
GRADE SELECTION GUIDE	6	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

SNMG-QR



Excellent economy due to 8 cutting edges. Strong insert shape. Mainly for rough facing and chamfering (not turning to a shoulder).

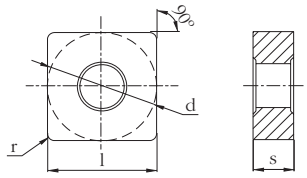
QR: Strong cutting edge geometry for roughing applications in all types of Steel. Well suited for unstable conditions and interrupted cuts.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1105	GP1225	GP1135	
SNMG 432-QR	SNMG 120408-QR	1/2	.500	3/16	1/32	.028 - .219	.007 - .020	★	★	★	
SNMG 433-QR	SNMG 120412-QR	1/2	.500	3/16	3/64	.040 - .219	.008 - .022	★		★	
SNMG 543-QR	SNMG 150612-QR	5/8	.625	1/4	3/64	.040 - .266	.008 - .022	★	★	★	
SNMG 544-QR	SNMG 150616-QR	5/8	.625	1/4	1/16	.055 - .266	.009 - .026	★		★	
SNMG 643-QR	SNMG 190612-QR	3/4	.750	1/4	3/64	.040 - .328	.008 - .022	★	★	★	
SNMG 644-QR	SNMG 190616-QR	3/4	.750	1/4	1/16	.055 - .328	.009 - .026	★		★	

Ordering Example: 20 pcs SNMG 644-QR GP1135

REFERENCE PAGES					
GRADE SELECTION GUIDE	6	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

SNMG-SM



Excellent economy due to 8 cutting edges. Strong insert shape. Mainly for rough facing and chamfering (not turning to a shoulder).

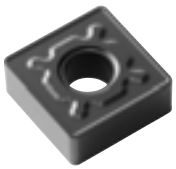
SM: Keen edge geometry especially for Stainless Steel. Unique edgeline reduces work hardening. Semi-finishing to rough machining.

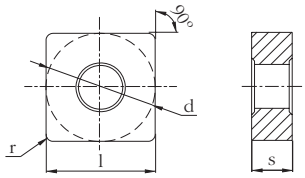
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STAINLESS STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GM1125	GM3125		
SNMG 321-SM	SNMG 090304-SM	3/8	.375	1/8	1/64	.016 - .141	.004 - .012	★	★		
SNMG 322-SM	SNMG 090308-SM	3/8	.375	1/8	1/32	.020 - .141	.005 - .016	★	★		
SNMG 431-SM	SNMG 120404-SM	1/2	.500	3/16	1/64	.016 - .187	.004 - .012	★	★		
SNMG 432-SM	SNMG 120408-SM	1/2	.500	3/16	1/32	.020 - .187	.005 - .016	★	★		
SNMG 433-SM	SNMG 120412-SM	1/2	.500	3/16	3/64	.031 - .187	.006 - .020	★	★		
SNMG 434-SM	SNMG 120416-SM	1/2	.500	3/16	1/16	.040 - .187	.007 - .024	★	★		
SNMG 542-SM	SNMG 150608-SM	5/8	.625	1/4	1/32	.020 - .219	.005 - .016	★	★		
SNMG 543-SM	SNMG 150612-SM	5/8	.625	1/4	3/64	.031 - .219	.006 - .020	★	★		
SNMG 544-SM	SNMG 150616-SM	5/8	.625	1/4	1/16	.040 - .219	.007 - .024	★	★		
SNMG 643-SM	SNMG 190612-SM	3/4	.750	1/4	3/64	.031 - .266	.006 - .020	★	★		
SNMG 644-SM	SNMG 190616-SM	3/4	.750	1/4	1/16	.040 - .266	.007 - .024	★	★		

Ordering Example: 20 pcs SNMG 644-SM GM1125

REFERENCE PAGES					
GRADE SELECTION GUIDE	6	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

SNMG-HK





Excellent economy due to 8 cutting edges. Strong insert shape. Mainly for rough facing and chamfering (not turning to a shoulder).

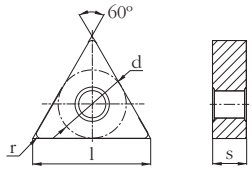
HK: Exceptionally broad application range geometry primarily for Cast Iron. Strong cutting edge, excellent durability. Semi-finishing to roughing.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		CAST IRON			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GK1115	GK1125		
SNMG 432-HK	SNMG 120408-HK	1/2	.500	3/16	1/32	.020 - .219	.004 - .016	★	★		
SNMG 433-HK	SNMG 120412-HK	1/2	.500	3/16	3/64	.031 - .219	.006 - .020	★	★		
SNMG 434-HK	SNMG 120416-HK	1/2	.500	3/16	1/16	.040 - .219	.008 - .026		★		
SNMG 543-HK	SNMG 150612-HK	5/8	.625	1/4	3/64	.031 - .297	.006 - .020	★	★		
SNMG 544-HK	SNMG 150616-HK	5/8	.625	1/4	1/16	.040 - .297	.008 - .026		★		
SNMG 643-HK	SNMG 190612-HK	3/4	.750	1/4	3/64	.031 - .359	.006 - .020	★	★		
SNMG 644-HK	SNMG 190616-HK	3/4	.750	1/4	1/16	.040 - .359	.008 - .026		★		

Ordering Example: 20 pcs SNMG 644-HK GK1125

REFERENCE PAGES					
GRADE SELECTION GUIDE	6	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

TNMG-QF



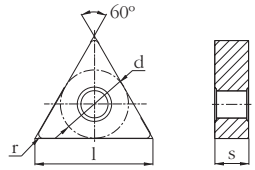
Economical insert, 6 cutting edges. General purpose turning, facing and boring. Extra long cutting edge useful when turning to shoulders

QF: First Choice Geometry for finishing and semi-finishing applications in all types of Steel.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1105	GP1115	GP1225	
TNMG 331-QF	TNMG 160404-QF	3/8	.650	3/16	1/64	.010 - .062	.003 - .010	★	★	★	
TNMG 332-QF	TNMG 160408-QF	3/8	.650	3/16	1/32	.016 - .080	.004 - .014	★	★	★	
TNMG 431-QF	TNMG 220404-QF	1/2	.866	3/16	1/64	.010 - .062	.003 - .010		★	★	
TNMG 432-QF	TNMG 220408-QF	1/2	.866	3/16	1/32	.016 - .080	.004 - .014		★	★	

Ordering Example: 20 pcs TNMG 432-QF GP1115

TNMG-SV



Economical insert, 6 cutting edges. General purpose turning, facing and boring. Extra long cutting edge useful when turning to shoulders.

SV: Sharp Edge Geometry for shaft turning, boring and unstable workpieces. Can handle a wide range of depths of cut.

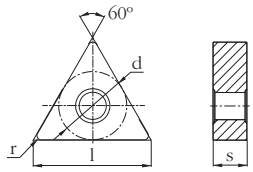
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1225			
TNMG 331R-SV	TNMG 160404R-SV	3/8	.650	3/16	1/64	.024 - .187	.004 - .016	★			
TNMG 331L-SV	TNMG 160404L-SV	3/8	.650	3/16	1/64	.024 - .187	.004 - .016	★			
TNMG 332R-SV	TNMG 160408R-SV	3/8	.650	3/16	1/32	.031 - .187	.004 - .018	★			
TNMG 332L-SV	TNMG 160408L-SV	3/8	.650	3/16	1/32	.031 - .187	.004 - .018	★			

Ordering Example: 20 pcs TNMG 332L-SV GP1225

NOTE: SV geometry inserts are available in both R (Right-hand) and L (left-hand) styles. Right-hand style is shown above.
Normal External Turning applications require Right-hand (R) inserts in Right-hand holders, and Left-hand (L) inserts in Left-hand holders.
For Internal / Boring applications, Left-hand (L) inserts are used in Right-hand bars, and Right-hand (R) inserts are used in Left-hand bars.

REFERENCE PAGES					
GRADE SELECTION GUIDE	6	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

TNMG-QM



Economical insert, 6 cutting edges. General purpose turning, facing and boring. Extra long cutting edge useful when turning to shoulders.

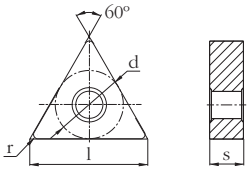
QM: First Choice Geometry for medium to semi-roughing applications in all types of Steel.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1105	GP1115	GP1225	
TNMG 221-QM	TNMG 110304-QM	1/4	.433	1/8	1/64	.016 - .109	.004 - .010		★	★	
TNMG 222-QM	TNMG 110308-QM	1/4	.433	1/8	1/32	.020 - .109	.005 - .014		★	★	
TNMG 331-QM	TNMG 160404-QM	3/8	.650	3/16	1/64	.016 - .156	.004 - .012	★	★	★	
TNMG 332-QM	TNMG 160408-QM	3/8	.650	3/16	1/32	.020 - .156	.005 - .016	★	★	★	
TNMG 333-QM	TNMG 160412-QM	3/8	.650	3/16	3/64	.031 - .156	.006 - .020	★	★	★	
TNMG 432-QM	TNMG 220408-QM	1/2	.866	3/16	1/32	.020 - .187	.005 - .016		★	★	
TNMG 433-QM	TNMG 220412-QM	1/2	.866	3/16	3/64	.031 - .187	.006 - .020		★	★	
TNMG 434-QM	TNMG 220416-QM	1/2	.866	3/16	1/16	.040 - .187	.007 - .024			★	

Ordering Example: 20 pcs TNMG 434-QM GP1225

REFERENCE PAGES					
GRADE SELECTION GUIDE	6	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

TNMG-QR



Economical insert, 6 cutting edges. General purpose turning, facing and boring. Extra long cutting edge useful when turning to shoulders.

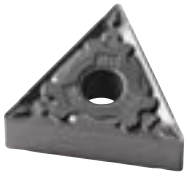
QR: Strong cutting edge geometry for roughing applications in all types of Steel. Well suited for unstable conditions and interrupted cuts.

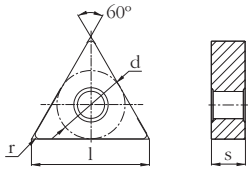
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1225	GP1135		
TNMG 433-QR	TNMG 220412-QR	1/2	.866	3/16	3/64	.040 - .219	.008 - .022	★	★		
TNMG 434-QR	TNMG 220416-QR	1/2	.866	3/16	1/16	.055 - .219	.009 - .026		★		
TNMG 543-QR	TNMG 270612-QR	5/8	1.083	1/4	3/64	.040 - .328	.008 - .022	★	★		
TNMG 544-QR	TNMG 270616-QR	5/8	1.083	1/4	1/16	.055 - .328	.009 - .026		★		

Ordering Example: 20 pcs TNMG 544-QR GP1135

REFERENCE PAGES					
GRADE SELECTION GUIDE	6	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

TNMG-SF





Economical insert, 6 cutting edges. General purpose turning, facing and boring. Extra long cutting edge useful when turning to shoulders.

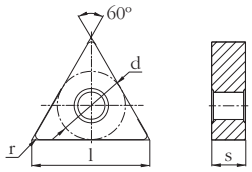
SF: Ultra-sharp cutting edge geometry for finishing in Stainless Steels. Low cutting forces and superior workpiece surface finish without burrs.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STAINLESS STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GS3115			
TNMG 331-SF	TNMG 160404-SF	3/8	.650	3/16	1/64	.004 - .062	.003 - .012	★			
TNMG 332-SF	TNMG 160408-SF	3/8	.650	3/16	1/32	.004 - .062	.004 - .016	★			

Ordering Example: 20 pcs TNMG 332-SF GS3115

NOTE: The primary application area for grade GS3115 is in stainless steel workpiece materials. GS3115 is also suitable for use with iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys.

TNMG-SM



Economical insert, 6 cutting edges. General purpose turning, facing and boring. Extra long cutting edge useful when turning to shoulders.

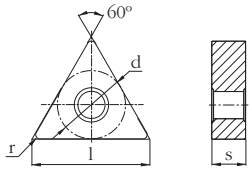
SM: Keen edge geometry especially for Stainless Steel. Unique edgeline reduces work hardening. Semi-finishing to rough machining.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STAINLESS STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GM1125	GM3125		
TNMG 331-SM	TNMG 160404-SM	3/8	.650	3/16	1/64	.016 - .156	.004 - .012	★	★		
TNMG 332-SM	TNMG 160408-SM	3/8	.650	3/16	1/32	.020 - .156	.005 - .016	★	★		
TNMG 333-SM	TNMG 160412-SM	3/8	.650	3/16	3/64	.031 - .156	.006 - .020	★	★		
TNMG 432-SM	TNMG 220408-SM	1/2	.866	3/16	1/32	.020 - .187	.005 - .016	★	★		
TNMG 433-SM	TNMG 220412-SM	1/2	.866	3/16	3/64	.031 - .187	.006 - .020	★	★		
TNMG 434-SM	TNMG 220416-SM	1/2	.866	3/16	1/16	.040 - .187	.007 - .024	★	★		

Ordering Example: 20 pcs TNMG 434-SM GM1125

REFERENCE PAGES					
GRADE SELECTION GUIDE	6	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

TNMG-UK



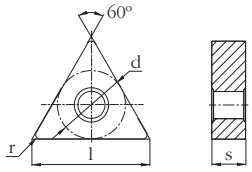
Economical insert, 6 cutting edges. General purpose turning, facing and boring. Extra long cutting edge useful when turning to shoulders.

UK: Lower cutting force geometry for Cast Iron. Edge geometry reduces cutting forces in moderate conditions / lighter cuts.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		CAST IRON			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GK1115	GK1125		
TNMG 331-UK	TNMG 160404-UK	3/8	.650	3/16	1/64	.012 - .187	.003 - .012	★	★		
TNMG 332-UK	TNMG 160408-UK	3/8	.650	3/16	1/32	.016 - .187	.004 - .014	★	★		

Ordering Example: 20 pcs TNMG 332-UK GK1115

TNMG-HK



Economical insert, 6 cutting edges. General purpose turning, facing and boring. Extra long cutting edge useful when turning to shoulders.

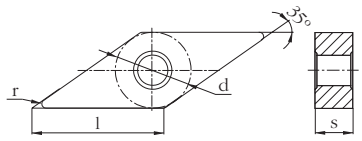
HK: Exceptionally broad application range geometry primarily for Cast Iron. Strong cutting edge, excellent durability. Semi-finishing to roughing.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		CAST IRON			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GK1115	GK1125		
TNMG 332-HK	TNMG 160408-HK	3/8	.650	3/16	1/32	.020 - .203	.004 - .016	★	★		
TNMG 333-HK	TNMG 160412-HK	3/8	.650	3/16	3/64	.031 - .203	.006 - .020	★	★		
TNMG 432-HK	TNMG 220408-HK	1/2	.866	3/16	1/32	.020 - .219	.004 - .016	★	★		
TNMG 433-HK	TNMG 220412-HK	1/2	.866	3/16	3/64	.031 - .219	.006 - .020	★	★		
TNMG 434-HK	TNMG 220416-HK	1/2	.866	3/16	1/16	.040 - .219	.008 - .026		★		
TNMG 543-HK	TNMG 270612-HK	5/8	1.083	1/4	3/64	.031 - .297	.006 - .020	★	★		
TNMG 544-HK	TNMG 270616-HK	5/8	1.083	1/4	1/16	.040 - .297	.008 - .026		★		

Ordering Example: 20 pcs TNMG 544-HK GK1125

REFERENCE PAGES					
GRADE SELECTION GUIDE	6	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

VNMG-QF



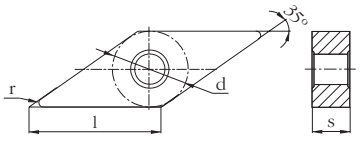
Double-sided 35° diamond. Profiling and copy turning. Not recommended for boring operations due to high negative rake of boring bar pocket.

QF: First Choice Geometry for finishing and semi-finishing applications in all types of Steel.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1105	GP1115	GP1225	
VNMG 331-QF	VNMG 160404-QF	3/8	.654	3/16	1/64	.010 - .062	.003 - .010	★	★	★	
VNMG 332-QF	VNMG 160408-QF	3/8	.654	3/16	1/32	.016 - .080	.004 - .014	★	★	★	
VNMG 431-QF	VNMG 220404-QF	1/2	.872	3/16	1/64	.010 - .062	.003 - .010		★		
VNMG 432-QF	VNMG 220408-QF	1/2	.872	3/16	1/32	.016 - .080	.004 - .014		★		

Ordering Example: 20 pcs VNMG 432-QF GP1115

VNMG-QM



Double-sided 35° diamond. Profiling and copy turning. Not recommended for boring operations due to high negative rake of boring bar pocket.

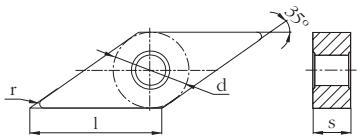
QM: First Choice Geometry for medium to semi-roughing applications in all types of Steel.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1105	GP1115	GP1225	
VNMG 331-QM	VNMG 160404-QM	3/8	.654	3/16	1/64	.016 - .141	.004 - .012	★	★	★	
VNMG 332-QM	VNMG 160408-QM	3/8	.654	3/16	1/32	.020 - .141	.005 - .016	★	★	★	
VNMG 333-QM	VNMG 160412-QM	3/8	.654	3/16	3/64	.031 - .141	.006 - .020		★	★	

Ordering Example: 20 pcs VNMG 333-QM GP1115

REFERENCE PAGES					
GRADE SELECTION GUIDE	6	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

VNMG-SF



Double sided 35° diamond. Profiling and copy turning. Not recommended for boring operations due to high negative rake of boring bar pocket.

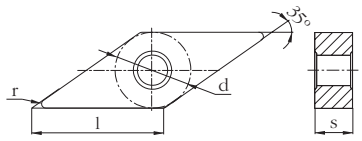
SF: Ultra-sharp cutting edge geometry for finishing in Stainless Steels. Low cutting forces and superior workpiece surface finish without burrs.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STAINLESS STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GS3115			
VNMG 331-SF	VNMG 160404-SF	3/8	.654	3/16	1/64	.004 - .062	.003 - .012	★			
VNMG 332-SF	VNMG 160408-SF	3/8	.654	3/16	1/32	.004 - .062	.004 - .016	★			

Ordering Example: 20 pcs VNMG 332-SF GS3115

NOTE: The primary application area for grade GS3115 is in stainless steel workpiece materials. GS3115 is also suitable for use with iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys.

VNMG-SM



Double-sided 35° diamond. Profiling and copy turning. Not recommended for boring operations due to high negative rake of boring bar pocket.

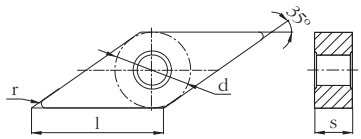
SM: Keen edge geometry especially for Stainless Steel. Unique edgeline reduces work hardening. Semi-finishing to rough machining.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STAINLESS STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GM1125	GM3125		
VNMG 331-SM	VNMG 160404-SM	3/8	.654	3/16	1/64	.016 - .141	.004 - .012	★	★		
VNMG 332-SM	VNMG 160408-SM	3/8	.654	3/16	1/32	.020 - .141	.005 - .016	★	★		

Ordering Example: 20 pcs VNMG 332-SM GM1125

REFERENCE PAGES					
GRADE SELECTION GUIDE	6	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

VNMG-UK



Double-sided 35° diamond. Profiling and copy turning. Not recommended for boring operations due to high negative rake of boring bar pocket.

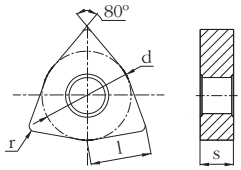
UK: Lower cutting force geometry for Cast Iron. Edge geometry reduces cutting forces in moderate conditions / lighter cuts.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		CAST IRON			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GK1115	GK1125		
VNMG 331-UK	VNMG 160404-UK	3/8	.654	3/16	1/64	.012 - .156	.003 - .012	★	★		
VNMG 332-UK	VNMG 160408-UK	3/8	.654	3/16	1/32	.016 - .156	.004 - .014	★	★		

Ordering Example: 20 pcs VNMG 332-UK GK1115

REFERENCE PAGES					
GRADE SELECTION GUIDE	6	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

WNMG-QF



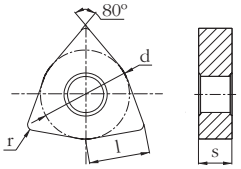
General purpose turning, facing and boring. 80° corner with 6 cutting edges. Maximum economy. Good choice for general turning.

QF: First Choice Geometry for finishing and semi-finishing applications in all types of Steel.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1105	GP1115	GP1225	
WNMG 331-QF	WNMG 060404-QF	3/8	.257	3/16	1/64	.010 - .062	.003 - .010		★	★	
WNMG 332-QF	WNMG 060408-QF	3/8	.257	3/16	1/32	.016 - .080	.004 - .014		★	★	
WNMG 431-QF	WNMG 080404-QF	1/2	.342	3/16	1/64	.010 - .062	.003 - .010	★	★	★	
WNMG 432-QF	WNMG 080408-QF	1/2	.342	3/16	1/32	.016 - .080	.004 - .014	★	★	★	

Ordering Example: 20 pcs WNMG 432-QF GP1115

WNMG-QM



General purpose turning, facing and boring. 80° corner with 6 cutting edges. Maximum economy. Good choice for general turning.

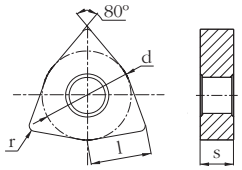
QM: First Choice Geometry for medium to semi-roughing applications in all types of Steel.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1105	GP1115	GP1225	
WNMG 331-QM	WNMG 060404-QM	3/8	.257	3/16	1/64	.016 - .109	.004 - .012		★	★	
WNMG 332-QM	WNMG 060408-QM	3/8	.257	3/16	1/32	.020 - .109	.005 - .016		★	★	
WNMG 431-QM	WNMG 080404-QM	1/2	.342	3/16	1/64	.016 - .141	.004 - .012	★	★	★	
WNMG 432-QM	WNMG 080408-QM	1/2	.342	3/16	1/32	.020 - .141	.005 - .016	★	★	★	
WNMG 433-QM	WNMG 080412-QM	1/2	.342	3/16	3/64	.031 - .141	.006 - .020	★	★	★	
WNMG 434-QM	WNMG 080416-QM	1/2	.342	3/16	1/16	.040 - .141	.007 - .024			★	

Ordering Example: 20 pcs WNMG 434-QM GP1225

REFERENCE PAGES					
GRADE SELECTION GUIDE	6	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

WNMG-QR



General purpose turning, facing and boring. 80° corner with 6 cutting edges. Maximum economy. Good choice for general turning.

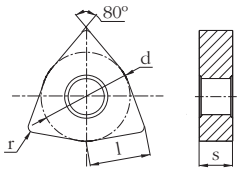
QR: Strong cutting edge geometry for roughing applications in all types of Steel. Well suited for unstable conditions and interrupted cuts.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1105	GP1115	GP1225	GP1135
WNMG 432-QR	WNMG 080408-QR	1/2	.342	3/16	1/32	.028 - .172	.007 - .020	★	★	★	★
WNMG 433-QR	WNMG 080412-QR	1/2	.342	3/16	3/64	.040 - .172	.008 - .022	★	★	★	★
WNMG 434-QR	WNMG 080416-QR	1/2	.342	3/16	1/16	.055 - .172	.009 - .026		★		★

Ordering Example: 20 pcs WNMG 434-QR GP1135

REFERENCE PAGES					
GRADE SELECTION GUIDE	6	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

WNMG-SF



General purpose turning, facing and boring. 80° corner with 6 cutting edges. Maximum economy. Good choice for general turning.

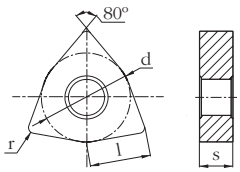
SF: Ultra-sharp cutting edge geometry for finishing in Stainless Steels. Low cutting forces and superior workpiece surface finish without burrs.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STAINLESS STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GS3115			
WNMG 431-SF	WNMG 080404-SF	1/2	.342	3/16	1/64	.004 - .062	.003 - .012	★			
WNMG 432-SF	WNMG 080408-SF	1/2	.342	3/16	1/32	.004 - .062	.004 - .016	★			

Ordering Example: 20 pcs WNMG 432-SF GS3115

NOTE: The primary application area for grade GS3115 is in stainless steel workpiece materials. GS3115 is also suitable for use with iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys.

WNMG-SM



General purpose turning, facing and boring. 80° corner with 6 cutting edges. Maximum economy. Good choice for general turning.

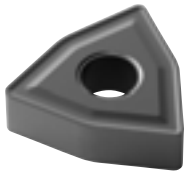
SM: Keen edge geometry especially for Stainless Steel. Unique edgeline reduces work hardening. Semi-finishing to rough machining.

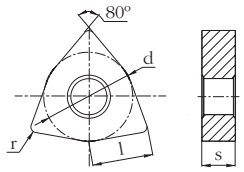
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STAINLESS STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GM1125	GM3125		
WNMG 331-SM	WNMG 060404-SM	3/8	.257	3/16	1/64	.016 - .109	.004 - .012	★	★		
WNMG 332-SM	WNMG 060408-SM	3/8	.257	3/16	1/32	.020 - .109	.005 - .016	★	★		
WNMG 333-SM	WNMG 060412-SM	3/8	.257	3/16	3/64	.031 - .109	.006 - .020	★	★		
WNMG 431-SM	WNMG 080404-SM	1/2	.342	3/16	1/64	.016 - .141	.004 - .012	★	★		
WNMG 432-SM	WNMG 080408-SM	1/2	.342	3/16	1/32	.020 - .141	.005 - .016	★	★		
WNMG 433-SM	WNMG 080412-SM	1/2	.342	3/16	3/64	.031 - .141	.006 - .020	★	★		

Ordering Example: 20 pcs WNMG 433-SM GM1125

REFERENCE PAGES					
GRADE SELECTION GUIDE	6	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

WNMG-UK





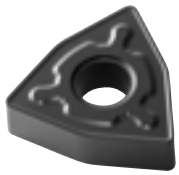
General purpose turning, facing and boring. 80° corner with 6 cutting edges. Maximum economy. Good choice for general turning.

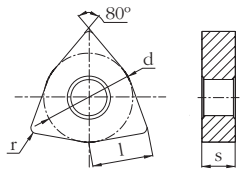
UK: Lower cutting force geometry for Cast Iron. Edge geometry reduces cutting forces in moderate conditions / lighter cuts.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		CAST IRON			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GK1115	GK1125		
WNMG 431-UK	WNMG 080404-UK	1/2	.342	3/16	1/64	.012 - .156	.003 - .012	★	★		
WNMG 432-UK	WNMG 080408-UK	1/2	.342	3/16	1/32	.016 - .156	.004 - .014	★	★		

Ordering Example: 20 pcs WNMG 432-UK GK1115

WNMG-HK





General purpose turning, facing and boring. 80° corner with 6 cutting edges. Maximum economy. Good choice for general turning.

HK: Exceptionally broad application range geometry primarily for Cast Iron. Strong cutting edge, excellent durability. Semi-finishing through to roughing.

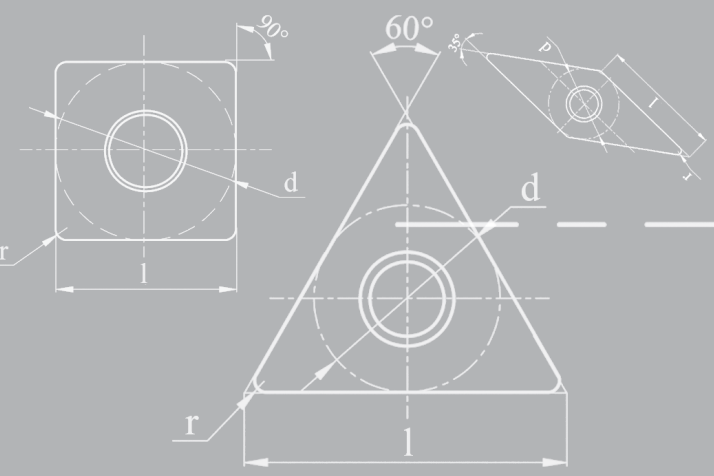
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		CAST IRON			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GK1115	GK1125		
WNMG 432-HK	WNMG 080408-HK	1/2	.342	3/16	1/32	.020 - .172	.004 - .016	★	★		
WNMG 433-HK	WNMG 080412-HK	1/2	.342	3/16	3/64	.031 - .172	.006 - .020	★	★		

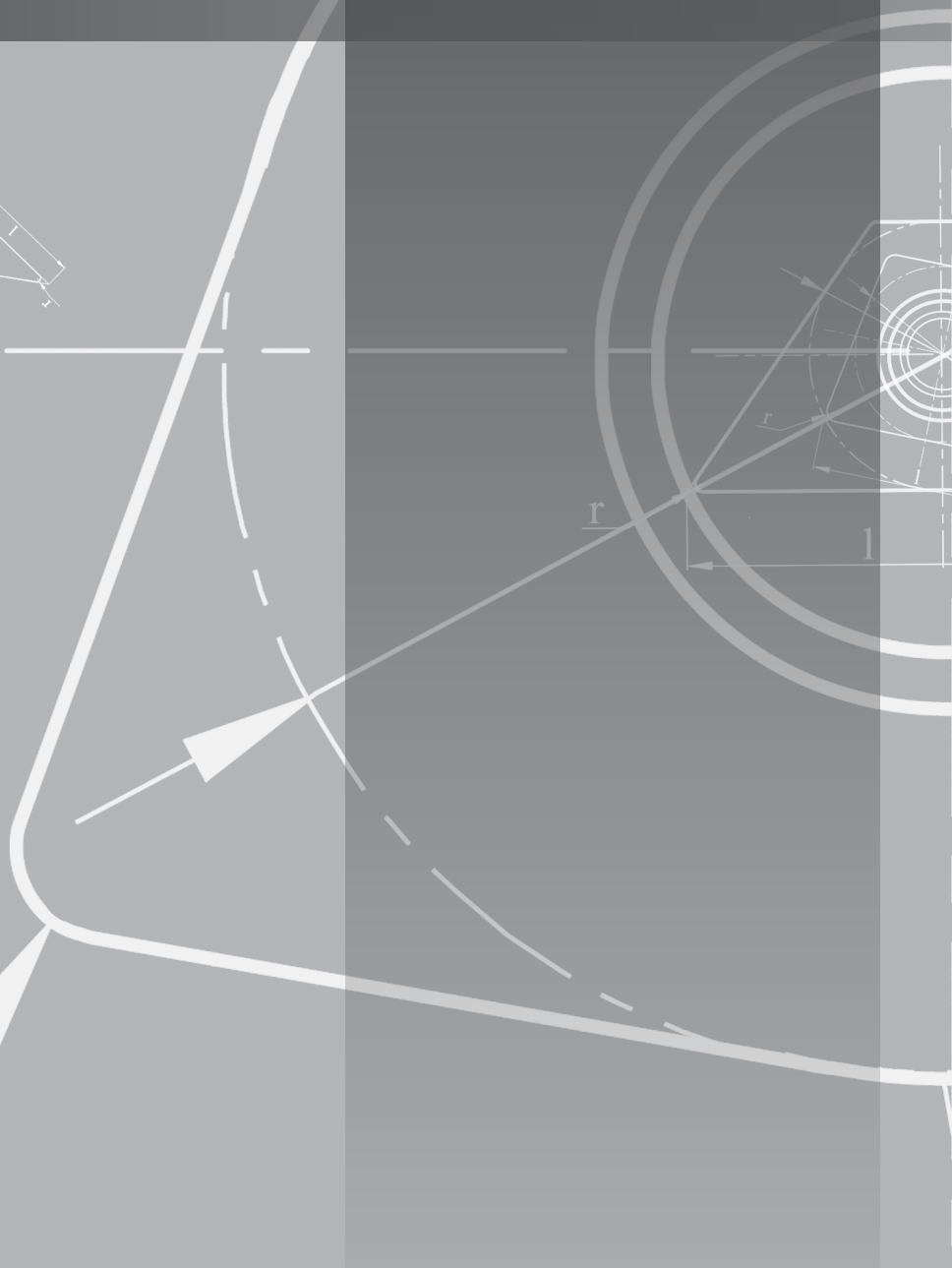
Ordering Example: 20 pcs WNMG 433-HK GK1115

REFERENCE PAGES					
GRADE SELECTION GUIDE	6	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

TURNING INSERTS | POSITIVE RAKE

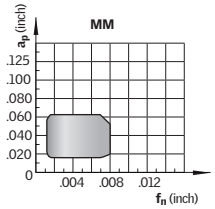
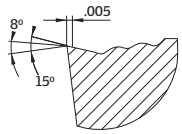
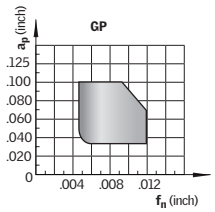
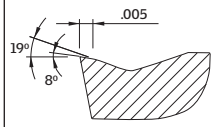
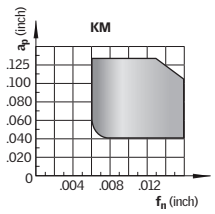
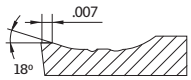
ANSI / ISO STANDARD INSERTS
FOR EXTERNAL TURNING AND
INTERNAL MACHINING OPERATIONS
WITH LOW CUTTING FORCES



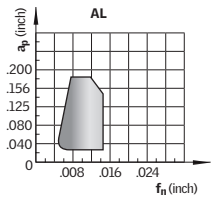
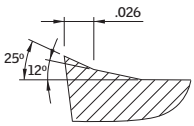


WORKPIECE MATERIAL	ANSI	ISO	Coating Type: CVD	Coating Type: PVD	Coating Type: Uncoated	
P Steel	C8	01	GP1105			wear resistance
		10	GP1115			
	C7	20	GP1225	GP3125		
	C6	30				
		40				toughness
M Stainless Steel	–	01	GM1125	GS3115		wear resistance
	–	10		GP3125		
	–	20				
	–	30				toughness
K Cast Iron	C4	01	GK1115			wear resistance
	C3	10		GP3125		
	C2	20				
	C1	30				toughness
N Non-Ferrous Materials	C4	01				wear resistance
	C3	10		GN3125	GN9125	
	C2	20				
	C1	30				toughness
	–	01				wear resistance
	–	10				
	–	20				
	–	30				toughness

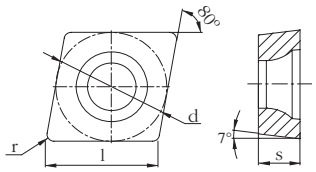
See pages 68 and 69 for more information on grades for turning.

Chipbreaker	Description	Chipbreaker Range	Design
MM P M	• High performance finishing chipbreaker • Double-positive chipformer design • Exceptionally sharp cutting edge • Low cutting forces • Superior workpiece surface finish		
GP P M K	• Good All-Round geometry for Positive Inserts • Works in a broad range of materials • Double-positive chipformer design • Reduced top land for feedrates < .004" • 11º Style inserts primarily used for boring		
KM P K	• Roughing chipbreaker - tough and strong • High fracture resistance • Variable land cutting edge design • Smooth cutting action and chip flow • Exceptional performance in steel and cast iron		

AL chipbreaker inserts, for aluminum and other non-ferrous materials

AL N NON-FERROUS	• Ultra-sharp edge with polished rake face • Super Positive (25º) top rake • Free cutting and smooth chip flow • Ultra-low cutting forces • Resistant to Built-up-Edge		

CCMT-MM



80° diamond inserts for turning and facing or boring and facing. Positive rake, screw-down inserts.

MM: Ultra-sharp cutting edge geometry for finishing and semi-finishing operations. Low cutting forces and superior workpiece surface finish.

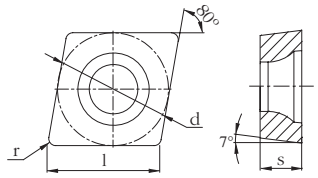
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			STAINLESS	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1105	GP1115	GP1225	GS3115	GM1125
CCMT 2(1.5)0.5-MM	CCMT 060202-MM	1/4	.254	3/32	.008	.004 - .031	.002 - .005		★	★	★	★
CCMT 2(1.5)1-MM	CCMT 060204-MM	1/4	.254	3/32	1/64	.004 - .047	.002 - .006	★	★	★	★	★
CCMT 3(2.5)0.5-MM	CCMT 09T302-MM	3/8	.381	5/32	.008	.004 - .031	.002 - .005		★	★	★	★
CCMT 3(2.5)1-MM	CCMT 09T304-MM	3/8	.381	5/32	1/64	.004 - .062	.002 - .006	★	★	★	★	★
CCMT 3(2.5)2-MM	CCMT 09T308-MM	3/8	.381	5/32	1/32	.004 - .062	.003 - .008	★	★	★	★	★

Ordering Example: 20 pcs CCMT 3(2.5)2-MM GM1125

NOTE: The primary application area for grade GS3115 is in stainless steel workpiece materials. GS3115 is also suitable for use with iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys.

REFERENCE PAGES					
GRADE SELECTION GUIDE	34	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

CCMT-GP



80° diamond inserts for turning and facing or boring and facing. Positive rake, screw-down inserts.

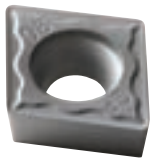
GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

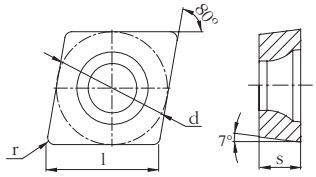
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL		CAST IRON	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1225		GK1115	
CCMT 2(1.5)1-GP	CCMT 060204-GP	1/4	.254	3/32	1/64	.020 - .047	.003 - .008	★		★	
CCMT 2(1.5)2-GP	CCMT 060208-GP	1/4	.254	3/32	1/32	.031 - .062	.004 - .010	★		★	
CCMT 3(2.5)0.5-GP	CCMT 09T302-GP	3/8	.381	5/32	.008	.012 - .039	.003 - .006	★		★	
CCMT 3(2.5)1-GP	CCMT 09T304-GP	3/8	.381	5/32	1/64	.020 - .062	.004 - .008	★		★	
CCMT 3(2.5)2-GP	CCMT 09T308-GP	3/8	.381	5/32	1/32	.031 - .080	.005 - .010	★		★	
CCMT 431-GP	CCMT 120404-GP	1/2	.508	3/16	1/64	.020 - .062	.004 - .008	★		★	
CCMT 432-GP	CCMT 120408-GP	1/2	.508	3/16	1/32	.031 - .080	.005 - .010	★		★	
CCMT 433-GP	CCMT 120412-GP	1/2	.508	3/16	3/64	.047 - .100	.006 - .012	★		★	

Ordering Example: 20 pcs CCMT 433-GP GP1225

REFERENCE PAGES					
GRADE SELECTION GUIDE	34	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

CCGT-GP





80° diamond inserts for turning and facing or boring and facing. Precision tolerance, positive rake screw-down inserts.

GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

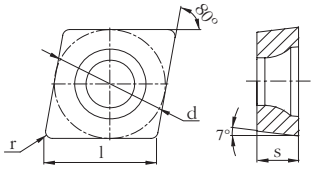
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP3125			
CCGT 2(1.5)1-GP	CCGT 060204-GP	1/4	.254	3/32	1/64	.020 - .047	.003 - .008	★			
CCGT 2(1.5)2-GP	CCGT 060208-GP	1/4	.254	3/32	1/32	.031 - .062	.004 - .010	★			
CCGT 3(2.5)0.5-GP	CCGT 09T302-GP	3/8	.381	5/32	.008	.010 - .031	.003 - .006	★			
CCGT 3(2.5)1-GP	CCGT 09T304-GP	3/8	.381	5/32	1/64	.020 - .062	.004 - .008	★			
CCGT 3(2.5)2-GP	CCGT 09T308-GP	3/8	.381	5/32	1/32	.031 - .080	.005 - .010	★			
CCGT 431-GP	CCGT 120404-GP	1/2	.508	3/16	1/64	.020 - .062	.004 - .008	★			
CCGT 432-GP	CCGT 120408-GP	1/2	.508	3/16	1/32	.031 - .080	.005 - .010	★			

Ordering Example: 20 pcs CCGT 432-GP GP3125

NOTE: The primary application area for grade GP3125 is in steel workpiece materials. GP3125 is also suitable for use with stainless steel and cast iron components.

REFERENCE PAGES					
GRADE SELECTION GUIDE	34	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

CCMT-KM



80° diamond inserts for turning and facing or boring and facing. Positive rake, screw-down inserts.

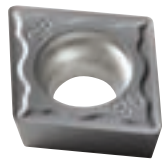
KM: Positive rake roughing geometry. Strong cutting edge with high fracture resistance. Excellent performance in steels and cast iron.

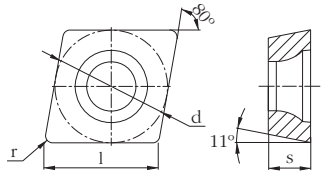
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL		CAST IRON	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1225		GK1115	
CCMT 3(2.5)1-KM	CCMT 09T304-KM	3/8	.381	5/32	1/64	.040 - .094	.006 - .012	★		★	
CCMT 3(2.5)2-KM	CCMT 09T308-KM	3/8	.381	5/32	1/32	.040 - .109	.007 - .014	★		★	
CCMT 432-KM	CCMT 120408-KM	1/2	.508	3/16	1/32	.040 - .109	.007 - .014	★		★	
CCMT 433-KM	CCMT 120412-KM	1/2	.508	3/16	3/64	.047 - .125	.008 - .016	★		★	

Ordering Example: 20 pcs CCMT 433-KM GP1225

REFERENCE PAGES					
GRADE SELECTION GUIDE	34	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

CPGT-GP





80° diamond inserts for turning and facing or boring and facing. Precision tolerance, positive rake screw-down inserts. 11° side clearance is ideal for boring.

GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

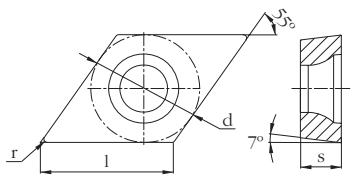
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP3125			
CPGT 2(1.5)1-GP	CPGT 060204-GP	1/4	.254	3/32	1/64	.020 - .047	.003 - .008	★			
CPGT 2(1.5)2-GP	CPGT 060208-GP	1/4	.254	3/32	1/32	.031 - .062	.004 - .010	★			
CPGT 3(2.5)0.5-GP	CPGT 09T302-GP	3/8	.381	5/32	.008	.010 - .031	.003 - .006	★			
CPGT 3(2.5)1-GP	CPGT 09T304-GP	3/8	.381	5/32	1/64	.020 - .062	.004 - .008	★			
CPGT 3(2.5)2-GP	CPGT 09T308-GP	3/8	.381	5/32	1/32	.031 - .080	.005 - .010	★			
CPGT 431-GP	CPGT 120404-GP	1/2	.508	3/16	1/64	.020 - .062	.004 - .008	★			
CPGT 432-GP	CPGT 120408-GP	1/2	.508	3/16	1/32	.031 - .080	.005 - .010	★			

Ordering Example: 20 pcs CPGT 432-GP GP3125

NOTE: The primary application area for grade GP3125 is in steel workpiece materials. GP3125 is also suitable for use with stainless steel and cast iron components.

REFERENCE PAGES					
GRADE SELECTION GUIDE	34	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

DCMT-MM



55° diamond inserts for profile turning and finishing. Positive rake screw-down inserts. Good choice for small diameter and slender workpieces.

MM: Ultra-sharp cutting edge geometry for finishing and semi-finishing operations. Low cutting forces and superior workpiece surface finish.

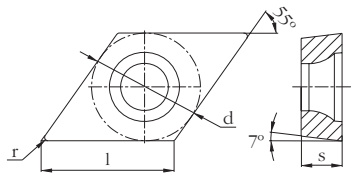
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			STAINLESS	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1105	GP1115	GP1225	GS3115	GM1125
DCMT 2(1.5)0.5-MM	DCMT 070202-MM	1/4	.305	3/32	.008	.004 - .031	.002 - .005		★	★	★	★
DCMT 2(1.5)1-MM	DCMT 070204-MM	1/4	.305	3/32	1/64	.004 - .047	.002 - .006	★	★	★	★	★
DCMT 3(2.5)0.5-MM	DCMT 11T302-MM	3/8	.458	5/32	.008	.004 - .031	.002 - .005		★	★	★	★
DCMT 3(2.5)1-MM	DCMT 11T304-MM	3/8	.458	5/32	1/64	.004 - .062	.002 - .006	★	★	★	★	★
DCMT 3(2.5)2-MM	DCMT 11T308-MM	3/8	.458	5/32	1/32	.004 - .062	.003 - .008	★	★	★	★	★

Ordering Example: 20 pcs DCMT 3(2.5)2-MM GM1125

NOTE: The primary application area for grade GS3115 is in stainless steel workpiece materials. GS3115 is also suitable for use with iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys.

REFERENCE PAGES					
GRADE SELECTION GUIDE	34	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

DCMT-GP



55° diamond inserts for profile turning and finishing. Positive rake screw-down inserts. Good choice for small diameter and slender workpieces.

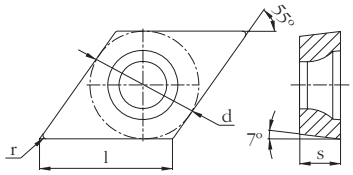
GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL		CAST IRON	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1225		GK1115	
DCMT 2(1.5)1-GP	DCMT 070204-GP	1/4	.305	3/32	1/64	.020 - .047	.003 - .008	★		★	
DCMT 2(1.5)2-GP	DCMT 070208-GP	1/4	.305	3/32	1/32	.031 - .062	.004 - .010	★		★	
DCMT 3(2.5)0.5-GP	DCMT 11T302-GP	3/8	.458	5/32	.008	.010 - .031	.003 - .006	★		★	
DCMT 3(2.5)1-GP	DCMT 11T304-GP	3/8	.458	5/32	1/64	.020 - .062	.004 - .008	★		★	
DCMT 3(2.5)2-GP	DCMT 11T308-GP	3/8	.458	5/32	1/32	.031 - .080	.005 - .010	★		★	
DCMT 431-GP	DCMT 150404-GP	1/2	.610	3/16	1/64	.020 - .062	.004 - .008	★		★	
DCMT 432-GP	DCMT 150408-GP	1/2	.610	3/16	1/32	.031 - .080	.005 - .010	★		★	
DCMT 433-GP	DCMT 150412-GP	1/2	.610	3/16	3/64	.047 - .125	.006 - .010	★		★	

Ordering Example: 20 pcs DCMT 433-GP GP1225

REFERENCE PAGES					
GRADE SELECTION GUIDE	34	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

DCGT-GP



55° diamond inserts for profile turning and finishing. Precision tolerance, positive rake screw-down inserts. Good choice for small diameter and slender workpieces.

GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

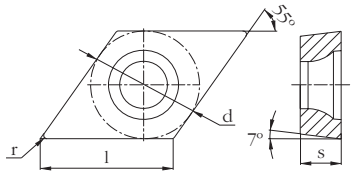
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP3125			
DCGT 2(1.5)0.5-GP	DCGT 070202-GP	1/4	.305	3/32	.008	.010 - .031	.003 - .006	★			
DCGT 2(1.5)1-GP	DCGT 070204-GP	1/4	.305	3/32	1/64	.020 - .047	.003 - .008	★			
DCGT 2(1.5)2-GP	DCGT 070208-GP	1/4	.305	3/32	1/32	.031 - .062	.004 - .010	★			
DCGT 3(2.5)0.5-GP	DCGT 11T302-GP	3/8	.458	5/32	.008	.010 - .031	.003 - .006	★			
DCGT 3(2.5)1-GP	DCGT 11T304-GP	3/8	.458	5/32	1/64	.020 - .062	.004 - .008	★			
DCGT 3(2.5)2-GP	DCGT 11T308-GP	3/8	.458	5/32	1/32	.031 - .080	.005 - .010	★			

Ordering Example: 20 pcs DCGT 3(2.5)2-GP GP3125

NOTE: The primary application area for grade GP3125 is in steel workpiece materials. GP3125 is also suitable for use with stainless steel and cast iron components.

REFERENCE PAGES					
GRADE SELECTION GUIDE	34	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

DCMT-KM



55° diamond inserts for profile turning and finishing. Positive rake screw-down inserts. Good choice for small diameter and slender workpieces.

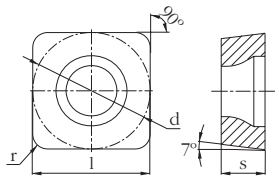
KM: Positive rake roughing geometry. Strong cutting edge with high fracture resistance. Excellent performance in steels and cast iron.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL		CAST IRON	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1225		GK1115	
DCMT 3(2.5)1-KM	DCMT 11T304-KM	3/8	.458	5/32	1/64	.040 - .094	.006 - .012	★		★	
DCMT 3(2.5)2-KM	DCMT 11T308-KM	3/8	.458	5/32	1/32	.040 - .109	.007 - .014	★		★	

Ordering Example: 20 pcs DCMT 3(2.5)2-KM GP1225

REFERENCE PAGES					
GRADE SELECTION GUIDE	34	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

SCMT-MM



Generally used for semi-finishing operations: turning, facing or boring. Positive rake screw-down style inserts. Good economy with 4 cutting edges.

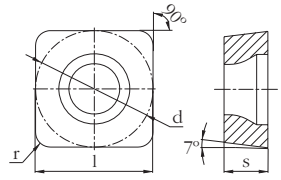
MM: Ultra-sharp cutting edge geometry for finishing and semi-finishing operations. Low cutting forces and superior workpiece surface finish.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			STAINLESS	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1105	GP1115	GP1225	GS3115	GM1125
SCMT 3(2.5)2-MM	SCMT 09T308-MM	3/8	.375	5/32	1/32	.004 - .062	.003 - .008	★	★	★	★	★

Ordering Example: 20 pcs SCMT 3(2.5)2-MM GM1125

NOTE: The primary application area for grade GS3115 is in stainless steel workpiece materials. GS3115 is also suitable for use with iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys.

SCMT-GP



Mainly for roughing operations: turning, facing or boring. Positive rake screw-down style inserts. Good economy with 4 cutting edges.

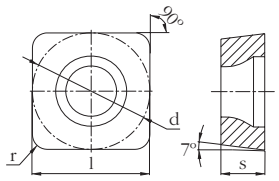
GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL		CAST IRON	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1225		GK1115	
SCMT 3(2.5)1-GP	SCMT 09T304-GP	3/8	.375	5/32	1/64	.020 - .062	.004 - .008	★		★	
SCMT 3(2.5)2-GP	SCMT 09T308-GP	3/8	.375	5/32	1/32	.031 - .080	.005 - .010	★		★	
SCMT 431-GP	SCMT 120404-GP	1/2	.500	3/16	1/64	.020 - .062	.004 - .008	★		★	
SCMT 432-GP	SCMT 120408-GP	1/2	.500	3/16	1/32	.031 - .080	.006 - .011	★		★	

Ordering Example: 20 pcs SCMT 432-GP GP1225

REFERENCE PAGES					
GRADE SELECTION GUIDE	34	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

SCMT-KM



Mainly for roughing operations: turning, facing or boring. Positive rake screw down style inserts Good economy with 4 cutting edges.

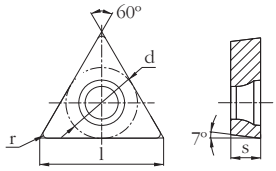
KM: Positive rake roughing geometry. Strong cutting edge with high fracture resistance. Excellent performance in steels and cast iron.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL		CAST IRON	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1225		GK1115	
SCMT 3(2.5)2-KM	SCMT 09T308-KM	3/8	.375	5/32	1/32	.040 - .109	.007 - .014	★		★	
SCMT 432-KM	SCMT 120408-KM	1/2	.500	3/16	1/32	.040 - .109	.007 - .014	★		★	

Ordering Example: 20 pcs SCMT 432-KM GP1225

REFERENCE PAGES					
GRADE SELECTION GUIDE	34	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

TCMT-MM



Popular for small diameter boring. Good economy and stable seating of insert. Positive rake screw down inserts.

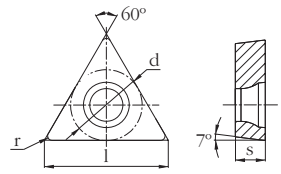
MM: Ultra-sharp cutting edge geometry for finishing and semi-finishing operations. Low cutting forces and superior workpiece surface finish.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			STAINLESS	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1105	GP1115	GP1225	GS3115	GM1125
TCMT 2(1.5)0.5-MM	TCMT 110202-MM	1/4	.433	3/32	.008	.004 - .031	.002 - .005		★	★	★	★
TCMT 2(1.5)1-MM	TCMT 110204-MM	1/4	.433	3/32	1/64	.004 - .047	.002 - .006	★	★	★	★	★

Ordering Example: 20 pcs TCMT 2(1.5)1-MM GM1125

NOTE: The primary application area for grade GS3115 is in stainless steel workpiece materials. GS3115 is also suitable for use with iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys.

TCMT-GP



Popular for small diameter boring. Good economy and stable seating of insert. Positive rake screw-down inserts.

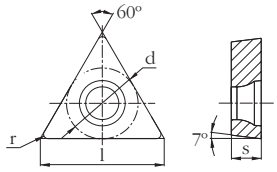
GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL		CAST IRON	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1225		GK1115	
TCMT 2(1.5)1-GP	TCMT 110204-GP	1/4	.433	3/32	1/64	.020 - .047	.003 - .008	★		★	
TCMT 2(1.5)2-GP	TCMT 110208-GP	1/4	.433	3/32	1/32	.031 - .062	.004 - .010	★		★	
TCMT 3(2.5)1-GP	TCMT 16T304-GP	3/8	.650	5/32	1/64	.020 - .062	.004 - .008	★		★	
TCMT 3(2.5)2-GP	TCMT 16T308-GP	3/8	.650	5/32	1/32	.031 - .080	.005 - .010	★		★	
TCMT 432-GP	TCMT 220408-GP	1/2	.866	3/16	1/32	.031 - .094	.006 - .012	★		★	

Ordering Example: 20 pcs TCMT 432-GP GP1225

REFERENCE PAGES					
GRADE SELECTION GUIDE	34	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

TCGT-GP



Popular for small diameter boring. Good economy and stable seating of insert. Precision tolerance, positive rake screw-down inserts.

GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

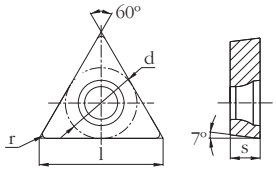
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP3125			
TCGT 1.8(1.5)1-GP	TCGT 090204-GP	7/32	.379	3/32	1/64	.016 - .040	.002 - .005	★			
TCGT 2(1.5)0.5-GP	TCGT 110202-GP	1/4	.433	3/32	.008	.010 - .031	.003 - .006	★			
TCGT 2(1.5)1-GP	TCGT 110204-GP	1/4	.433	3/32	1/64	.020 - .047	.003 - .008	★			
TCGT 2(1.5)2-GP	TCGT 110208-GP	1/4	.433	3/32	1/32	.031 - .062	.004 - .010	★			
TCGT 3(2.5)1-GP	TCGT 16T304-GP	3/8	.650	5/32	1/64	.020 - .062	.004 - .008	★			
TCGT 3(2.5)2-GP	TCGT 16T308-GP	3/8	.650	5/32	1/32	.031 - .080	.005 - .010	★			

Ordering Example: 20 pcs TCGT 3(2.5)2-GP GP3125

NOTE: The primary application area for grade GP3125 is in steel workpiece materials. GP3125 is also suitable for use with stainless steel and cast iron components.

REFERENCE PAGES					
GRADE SELECTION GUIDE	34	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

TCMT-KM



Popular for small diameter boring. Good economy and stable seating of insert. Positive rake screw down inserts.

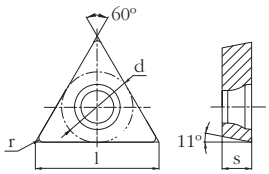
KM: Positive rake roughing geometry. Strong cutting edge with high fracture resistance. Excellent performance in steels and cast iron.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL		CAST IRON	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1225		GK1115	
TCMT 2(1.5)1-KM	TCMT 110204-KM	1/4	.433	3/32	1/64	.040 - .080	.006 - .010	★		★	
TCMT 3(2.5)1-KM	TCMT 16T304-KM	3/8	.650	5/32	1/64	.040 - .094	.006 - .012	★		★	
TCMT 3(2.5)2-KM	TCMT 16T308-KM	3/8	.650	5/32	1/32	.040 - .109	.007 - .014	★		★	

Ordering Example: 20 pcs TCMT 3(2.5)2-KM GP1225

REFERENCE PAGES					
GRADE SELECTION GUIDE	34	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

TPMT-MM



Popular for small diameter boring. Good economy and stable seating of insert. Positive rake screw-down inserts. 11° side clearance is ideal for boring.

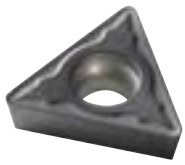
MM: Ultra-sharp cutting edge geometry for finishing and semi-finishing operations. Low cutting forces and superior workpiece surface finish.

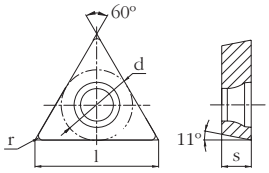
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL		STAINLESS	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1115	GP1225	GS3115	GM1125
TPMT 2(1.5)0.5-MM	TPMT 110202-MM	1/4	.433	3/32	.008	.004 - .031	.002 - .005	★	★	★	★
TPMT 2(1.5)1-MM	TPMT 110204-MM	1/4	.433	3/32	1/64	.004 - .047	.002 - .006	★	★	★	★

Ordering Example: 20 pcs TPMT 2(1.5)1-MM GM1125

NOTE: The primary application area for grade GS3115 is in stainless steel workpiece materials. GP3115 is also suitable for use with iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys.

TPGT-GP





Popular for small diameter boring. Good economy and stable seating of insert. Precision tolerance, positive rake screw-down inserts. 11° side clearance is ideal for boring.

GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

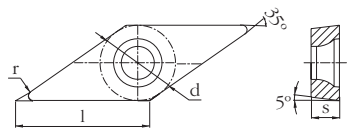
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP3125			
TPGT 2(1.5)1-GP	TPGT 110204-GP	1/4	.433	3/32	1/64	.020 - .047	.003 - .008	★			
TPGT 2(1.5)2-GP	TPGT 110208-GP	1/4	.433	3/32	1/32	.031 - .062	.004 - .010	★			
TPGT 3(2.5)1-GP	TPGT 16T304-GP	3/8	.650	5/32	1/64	.020 - .062	.004 - .008	★			
TPGT 3(2.5)2-GP	TPGT 16T308-GP	3/8	.650	5/32	1/32	.031 - .080	.005 - .010	★			

Ordering Example: 20 pcs TPGT 3(2.5)2-GP GP3125

NOTE: The primary application area for grade GP3125 is in steel workpiece materials. GP3125 is also suitable for use with stainless steel and cast iron components.

REFERENCE PAGES					
GRADE SELECTION GUIDE	34	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

VBMT-MM



First choice shape for 35° diamond profile turning and boring. Positive rake screw-down inserts with 5° side clearance.

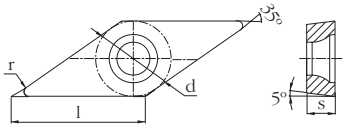
MM: Ultra-sharp cutting edge geometry for finishing and semi-finishing operations. Low cutting forces and superior workpiece surface finish.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			STAINLESS	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1105	GP1115	GP1225	GS3115	GM1125
VBMT 221-MM	VBMT 110304-MM	1/4	.436	1/8	1/64	.004 - .047	.002 - .006		★	★	★	★
VBMT 331-MM	VBMT 160404-MM	3/8	.654	3/16	1/64	.004 - .062	.002 - .006	★	★	★	★	★
VBMT 332-MM	VBMT 160408-MM	3/8	.654	3/16	1/32	.004 - .062	.003 - .008	★	★	★	★	★

Ordering Example: 20 pcs VBMT 332-MM GM1125

NOTE: The primary application area for grade GS3115 is in stainless steel workpiece materials. GS3115 is also suitable for use with iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys.

VBMT-GP



First choice for 35° diamond external profile turning. 5° clearance angle provides more secure insert clamping than VCMT style.

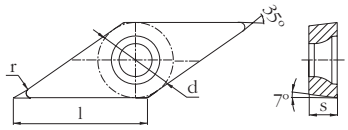
GP: All-round positive rake geometry with wide application area.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL		CAST IRON	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1225		GK1115	
VBMT 331-GP	VBMT 160404-GP	3/8	.654	3/16	1/64	.020 - .062	.004 - .008	★		★	
VBMT 332-GP	VBMT 160408-GP	3/8	.654	3/16	1/32	.031 - .080	.005 - .010	★		★	

Ordering Example: 20 pcs VBMT 332-GP GP1225

REFERENCE PAGES					
GRADE SELECTION GUIDE	34	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

VCMT-GP



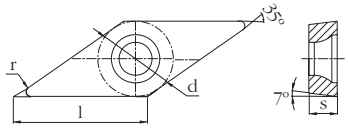
First choice shape for 35° diamond profile turning and boring. Positive cutting action provides for a more secure cutting edge than VNMG style.

GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL		CAST IRON	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1225		GK1115	
VCMT 221-GP	VCMT 110304-GP	1/4	.436	1/8	1/64	.020 - .047	.003 - .008	★		★	
VCMT 331-GP	VCMT 160404-GP	3/8	.654	3/16	1/64	.020 - .062	.004 - .008	★		★	
VCMT 332-GP	VCMT 160408-GP	3/8	.654	3/16	1/32	.031 - .080	.005 - .010	★		★	

Ordering Example: 20 pcs VCMT 332-GP GP1225

VCGT-GP



First choice shape for 35° diamond profile turning and boring. Precision tolerance. Positive cutting action provides for a more secure cutting edge than VNMG style.

GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP3125			
VCGT 221-GP	VCGT 110304-GP	1/4	.436	1/8	1/64	.020 - .047	.003 - .008	★			
VCGT 331-GP	VCGT 160404-GP	3/8	.654	3/16	1/64	.020 - .062	.004 - .008	★			
VCGT 332-GP	VCGT 160408-GP	3/8	.654	3/16	1/32	.031 - .080	.005 - .010	★			

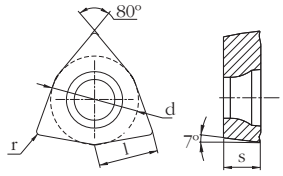
Ordering Example: 20 pcs VCGT 332-GP GP3125

NOTE: VCMT and VCGT inserts fit into and can be used with toolholders and boring bars made for VBMT-style inserts.

NOTE: The primary application area for grade GP3125 is in steel workpiece materials. GP3125 is also suitable for use with stainless steel and cast iron components.

REFERENCE PAGES					
GRADE SELECTION GUIDE	34	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

WCMT-GP



80° corner Trigon inserts for turning, facing and boring. Positive rake screw-down inserts. Extra economy due to 3 cutting edges.

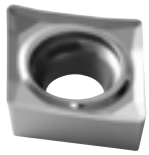
GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

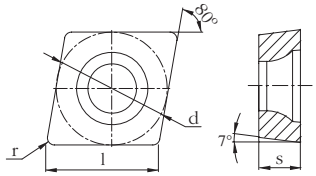
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL		CAST IRON	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1225		GK1115	
WCMT 3(2.5)1-GP	WCMT 06T304-GP	3/8	.257	5/32	1/64	.020 - .062	.003 - .008	★		★	
WCMT 3(2.5)2-GP	WCMT 06T308-GP	3/8	.257	5/32	1/32	.031 - .080	.005 - .010	★		★	

Ordering Example: 20 pcs WCMT 3(2.5)2-GP GP1225

REFERENCE PAGES					
GRADE SELECTION GUIDE	34	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

CCGX-AL





Precision Ground, High Positive, polished 80° diamond inserts for turning, boring and facing of Aluminum, non-ferrous materials and non-metallics.

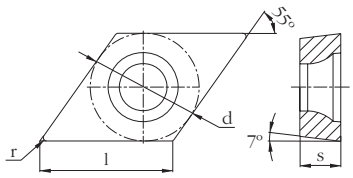
AL: Extremely high 25° positive rake geometry. Super sharp edgeline with polished face for smooth chip flow.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		NON-FERROUS			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GN3125	GN9125		
CCGX 2(1.5)0.5-AL	CCGX 060202-AL	1/4	.254	3/32	.008	.010 - .047	.002 - .008	★	★		
CCGX 2(1.5)1-AL	CCGX 060204-AL	1/4	.254	3/32	1/64	.016 - .062	.004 - .010	★	★		
CCGX 2(1.5)2-AL	CCGX 060208-AL	1/4	.254	3/32	1/32	.020 - .062	.006 - .020	★	★		
CCGX 3(2.5)0.5-AL	CCGX 09T302-AL	3/8	.381	5/32	.008	.010 - .094	.002 - .008	★	★		
CCGX 3(2.5)1-AL	CCGX 09T304-AL	3/8	.381	5/32	1/64	.016 - .125	.004 - .010	★	★		
CCGX 3(2.5)2-AL	CCGX 09T308-AL	3/8	.381	5/32	1/32	.020 - .125	.006 - .020	★	★		
CCGX 430.5-AL	CCGX 120402-AL	1/2	.508	3/16	.008	.010 - .125	.002 - .008	★	★		
CCGX 431-AL	CCGX 120404-AL	1/2	.508	3/16	1/64	.016 - .187	.004 - .010	★	★		
CCGX 432-AL	CCGX 120408-AL	1/2	.508	3/16	1/32	.020 - .187	.006 - .020	★	★		

Ordering Example: 20 pcs CCGX 432-AL GN9125

REFERENCE PAGES					
GRADE SELECTION GUIDE	34	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

DCGX-AL



Precision Ground, High Positive, polished 55° diamond inserts for profiling of Aluminum, non-ferrous materials and non-metallics.

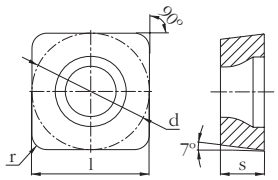
AL: Extremely high 25° positive rake geometry. Super sharp edgeline with polished face for smooth chip flow.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		NON-FERROUS			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GN3125	GN9125		
DCGX 2(1.5)0.5-AL	DCGX 070202-AL	1/4	.305	3/32	.008	.010 - .062	.002 - .008	★	★		
DCGX 2(1.5)1-AL	DCGX 070204-AL	1/4	.305	3/32	1/64	.016 - .094	.004 - .010	★	★		
DCGX 2(1.5)2-AL	DCGX 070208-AL	1/4	.305	3/32	1/32	.020 - .094	.006 - .020	★	★		
DCGX 3(2.5)0.5-AL	DCGX 11T302-AL	3/8	.458	5/32	.008	.010 - .094	.002 - .008	★	★		
DCGX 3(2.5)1-AL	DCGX 11T304-AL	3/8	.458	5/32	1/64	.016 - .125	.004 - .010	★	★		
DCGX 3(2.5)2-AL	DCGX 11T308-AL	3/8	.458	5/32	1/32	.020 - .125	.006 - .020	★	★		

Ordering Example: 20 pcs DCGX 3(2.5)2-AL GN9125

REFERENCE PAGES					
GRADE SELECTION GUIDE	34	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

SCGX-AL



Precision Ground, High Positive, polished square inserts for turning, facing and boring of Aluminum, non-ferrous materials and non-metallics.

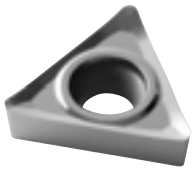
AL: Extremely high 25° positive rake geometry. Super sharp edgeline with polished face for smooth chip flow.

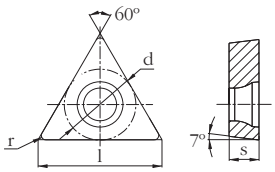
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		NON-FERROUS			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GN3125	GN9125		
SCGX 3(2.5)1-AL	SCGX 09T304-AL	3/8	.375	5/32	1/64	.016 - .125	.004 - .010	★	★		
SCGX 3(2.5)2-AL	SCGX 09T308-AL	3/8	.375	5/32	1/32	.020 - .125	.006 - .020	★	★		
SCGX 431-AL	SCGX 120404-AL	1/2	.500	3/16	1/64	.016 - .156	.004 - .010	★	★		
SCGX 432-AL	SCGX 120408-AL	1/2	.500	3/16	1/32	.020 - .156	.006 - .020	★	★		

Ordering Example: 20 pcs SCGX 432-AL GN9125

REFERENCE PAGES					
GRADE SELECTION GUIDE	34	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

TCGX-AL





Precision Ground, High Positive, polished triangular inserts for turning and boring of Aluminum, non-ferrous materials and non-metallics.

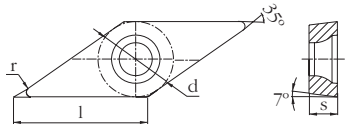
AL: Extremely high 25° positive rake geometry. Super sharp edgeline with polished face for smooth chip flow.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		NON-FERROUS			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GN3125	GN9125		
TCGX 1.8(1.5)1-AL	TCGX 090204-AL	7/32	.379	3/32	1/64	.016 - .094	.004 - .008	★	★		
TCGX 2(1.5)0.5-AL	TCGX 110202-AL	1/4	.433	3/32	.008	.010 - .094	.002 - .008	★	★		
TCGX 2(1.5)1-AL	TCGX 110204-AL	1/4	.433	3/32	1/64	.016 - .125	.004 - .010	★	★		
TCGX 2(1.5)2-AL	TCGX 110208-AL	1/4	.433	3/32	1/32	.020 - .125	.006 - .020	★	★		
TCGX 3(2.5)0.5-AL	TCGX 16T302-AL	3/8	.650	5/32	.008	.010 - .125	.002 - .008	★	★		
TCGX 3(2.5)1-AL	TCGX 16T304-AL	3/8	.650	5/32	1/64	.016 - .156	.004 - .010	★	★		
TCGX 3(2.5)2-AL	TCGX 16T308-AL	3/8	.650	5/32	1/32	.020 - .156	.006 - .020	★	★		

Ordering Example: 20 pcs TCGX 3(2.5)2-AL GN9125

REFERENCE PAGES					
GRADE SELECTION GUIDE	34	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

VCGX-AL



Precision Ground, High Positive, polished 35° diamond inserts for intricate profiling of Aluminum, non-ferrous materials and non-metallics.

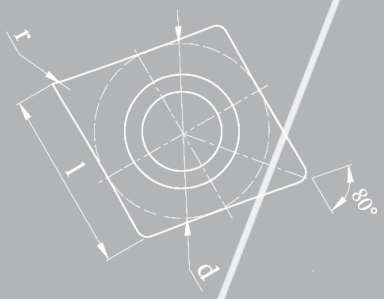
AL: Extremely high 25° positive rake geometry. Super sharp edgeline with polished face for smooth chip flow.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		NON-FERROUS			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GN3125	GN9125		
VCGX 220.5-AL	VCGX 110302-AL	1/4	.436	1/8	.008	.010 - .062	.002 - .008	★	★		
VCGX 221-AL	VCGX 110304-AL	1/4	.436	1/8	1/64	.016 - .087	.004 - .010	★	★		
VCGX 222-AL	VCGX 110308-AL	1/4	.436	1/8	1/32	.020 - .087	.006 - .020	★	★		
VCGX 330.5-AL	VCGX 160402-AL	3/8	.654	3/16	.008	.010 - .125	.002 - .008	★	★		
VCGX 331-AL	VCGX 160404-AL	3/8	.654	3/16	1/64	.016 - .156	.004 - .010	★	★		
VCGX 332-AL	VCGX 160408-AL	3/8	.654	3/16	1/32	.020 - .156	.006 - .020	★	★		
VCGX 333-AL	VCGX 160412-AL	3/8	.654	3/16	3/64	.020 - .156	.006 - .031	★	★		
VCGX 220512-AL	VCGX 220512-AL	1/2	.872	7/32	3/64	.020 - .187	.006 - .031	★	★		
VCGX 220516-AL	VCGX 220516-AL	1/2	.872	7/32	1/16	.020 - .187	.006 - .031	★	★		
VCGX 220530-AL	VCGX 220530-AL	1/2	.872	7/32	.118	.020 - .187	.010 - .040	★	★		

Ordering Example: 20 pcs VCGX 220530-AL GN9125

REFERENCE PAGES					
GRADE SELECTION GUIDE	34	TECHNICAL INFORMATION	59	CUTTING SPEED RECOMMENDATIONS	66

TECHNICAL INFORMATION TURNING

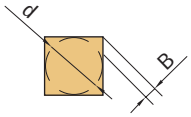
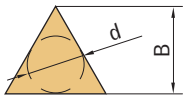
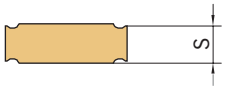


EXAMPLE 1

C	N	M	G	4	3	2		-	QM
1	2	3	4	5	6	7	8		9

1		
Insert Shape		
C	80⁰ Diamond	
D	55⁰ Diamond	
S	Square	
T	Triangle	
V	35⁰ Diamond	
W	80⁰ Corner Trigon	

2	
Clearance Angle	
	
B	5⁰ Positive Rake
C	7⁰ Positive Rake
N	0⁰ Negative Rake
P	11⁰ Positive Rake

3			
Tolerances, inch			
			
Tolerance Class	tolerance on 'd'	tolerance on 'B'	tolerance on 's'
G	± .001	± .001	± .005
M	see table below	see table below	± .005

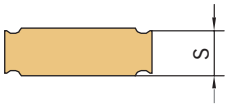
Tolerance Class M, inch				
d	**tolerance on 'd'**	**tolerance on 'B'**		
	All Shapes	C, S, T, W Shapes	D Shape	V Shape
7/32	± .002	± .003	± .004	N/A
1/4	± .002	± .003	± .004	± .007
3/8	± .002	± .003	± .004	± .007
1/2	± .003	± .005	± .006	± .010
5/8	± .004	± .006	± .007	N/A
3/4	± .004	± .006	± .007	N/A

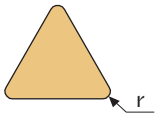
EXAMPLE 2

V	C	G	T	3	3	1		-	GP
1	2	3	4	5	6	7	8		9

4		
Insert Type		
G	With hole, Pin / Top Clamp Double-sided	
T	With hole, Screw-down Clamping Single-sided	
X	Manufacturer-Specific Design	——

5	
Insert Size	
Inscribed Circle, d, inch	
	
Symbol indicates number of 1/8ths of an inch	
Symbol	d
1.8	7/32
2	1/4
3	3/8
4	1/2
5	5/8
6	3/4

6	
Thickness, inch	
	
Symbol indicates number of 1/16ths of an inch	
Symbol	s
1.5	3/32
2	1/8
2.5	5/32
3	3/16
4	1/4

7	
Nose Radius, inch	
	
Symbol indicates number of 1/64ths of an inch	
Symbol	r
0.5	.008
1	1/64
2	1/32
3	3/64
4	1/16

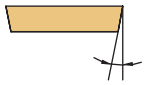
8	
Hand of Insert (optional)	
R	Right-hand
L	Left-hand

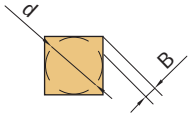
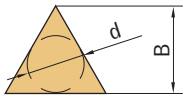
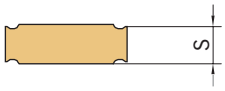
9
Chipbreaker Designation
Indicates the machining properties or chipbreaker features Manufacturer-specific

EXAMPLE 1

C	N	M	G	12	04	08		-	QM
1	2	3	4	5	6	7	8		9

1		
Insert Shape		
C	80⁰ Diamond	
D	55⁰ Diamond	
S	Square	
T	Triangle	
V	35⁰ Diamond	
W	80⁰ Corner Trigon	

2	
Clearance Angle	
	
B	5⁰ Positive Rake
C	7⁰ Positive Rake
N	0⁰ Negative Rake
P	11⁰ Positive Rake

3			
Tolerances, mm			
			
Tolerance Class	tolerance on 'd'	tolerance on 'B'	tolerance on 's'
G	± 0.025	± 0.025	± 0.13
M	see table below	see table below	± 0.13

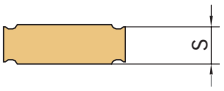
Tolerance Class M, mm				
d	**tolerance on 'd'**	**tolerance on 'B'**		
	All Shapes	C, S, T, W Shapes	D Shape	V Shape
5.556	± 0.05	± 0.08	± 0.10	N/A
6.350	± 0.05	± 0.08	± 0.10	± 0.18
9.525	± 0.05	± 0.08	± 0.10	± 0.18
12.700	± 0.08	± 0.13	± 0.15	± 0.25
15.875	± 0.10	± 0.15	± 0.18	N/A
19.050	± 0.10	± 0.15	± 0.18	N/A

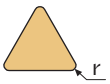
EXAMPLE 2

V	C	G	T	16	04	04		-	GP
1	2	3	4	5	6	7	8		9

4		
Insert Type		
G	With hole, Pin / Top Clamp Double-sided	
T	With hole, Screw-down Clamping Single-sided	
X	Manufacturer-Specific Design	——

5						
Insert Size						
Cutting Edge Length, mm						
Symbol	C	D	S	T	V	W
06	6.5					6.5
07		7.8				
08						8.7
09	9.7		9.5	9.6		
11		11.6		11.0	11.1	
12	12.9		12.7			
15		15.5	15.9			
16	16.1			16.5	16.6	
19	19.4		19.1			
22				22.0	22.2	
27				27.5		

6	
Thickness, mm	
	
Symbol	s
02	2.38
03	3.18
T3	3.97
04	4.76
05	5.56
06	6.35

7	
Nose Radius, mm	
	
Symbol	r
02	0.2
04	0.4
08	0.8
12	1.2
16	1.6
30	3.0

8	
Hand of Insert (optional)	
R	Right-hand
L	Left-hand

9
Chipbreaker Designation
Indicates the machining properties or chipbreaker features Manufacturer-specific

Spindle speed, n (rpm)

$$n = \frac{3.82 \times v_c}{D}$$

Cutting speed, v_c (ft / min)

$$v_c = .262 \times D \times n$$

Feed rate, v_f (in / min)

$$v_f = n \times f_n$$

Machining time, t (min)

$$t = \frac{l_m}{v_f}$$

Metal removal rate, Q (in^3 / min)

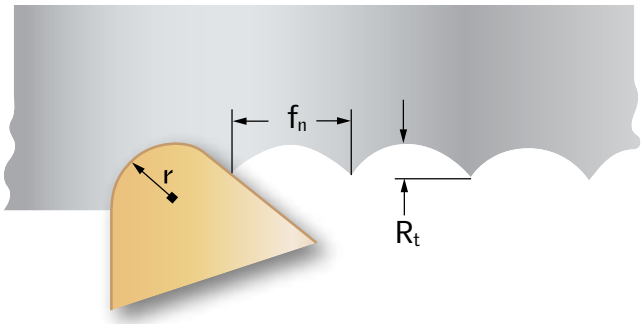
$$Q = v_c \times a_p \times f_n \times 12$$

a_p	depth of cut	inches
D	workpiece diameter	inches
f_n	feed per revolution	inches
l_m	machined length	inches
n	spindle speed	rev/min
Q	metal removal rate	$inches^3$/min
t	machining time	minutes
v_c	cutting speed	feet/min
v_f	feed rate	inches/min

The machined surface and tolerances achieved on components are directly affected by both the insert nose radius and the feed rate.

From a strictly theoretical perspective, surface roughness can be calculated from the following formula:

$$R_t = \frac{f_n^2 \times 10^6}{8 \times r}$$



Where R_t = Theoretical Profile Depth, µinches
f_n = feed / rev, inches
r = insert nose radius, inches

The following table presents feed values for common insert nose radius sizes and surface roughness requirements:

R_t, µinch	feed f_n, inches / rev				
	r = 1/64″	r = 1/32″	r = 3/64″	r = 1/16″	r = 3/32″
16	.0015	.002	.0025	.003	.0035
32	.002	.003	.0035	.004	.005
63	.003	.004	.005	.0055	.007
125	.004	.0055	.007	.008	.010
250	.0055	.008	.010	.011	.014
500	.008	.011	.014	.016	.019

The maximum feed per rev can be determined from the table by selecting the nose radius and specified surface roughness requirement.

For example, **Surface roughness requirement R_t = 63 µinches**

Insert nose radius r = 1/32″

Theoretical starting point for feed f_n => .004 inches / rev

When selecting the feed for finishing to a specified level of surface roughness, the feed values provided in the table should not be exceeded. In general the feed in a finishing operation should be kept low in order to produce an acceptable component finish.

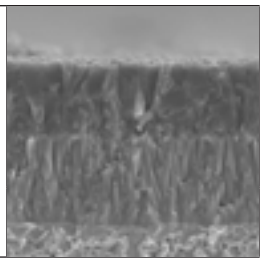
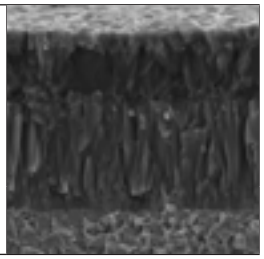
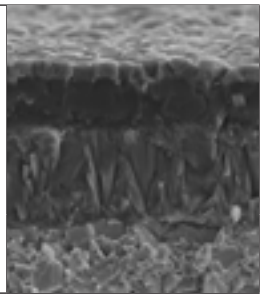
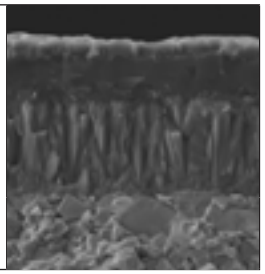
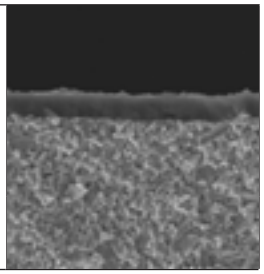
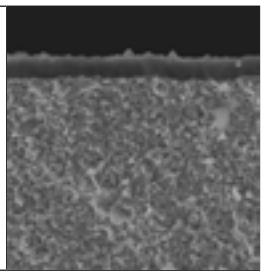
ISO	Material Group	Workpiece Material	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)														
				GP1105			GP1115			GP1225			GP1135			GP3125		
				f_n (inch/rev)			f_n (inch/rev)			f_n (inch/rev)			f_n (inch/rev)			f_n (inch/rev)		
				.004	.008	.012	.004	.008	.012	.004	.008	.016	.004	.016	.024	.004	.008	.012
P Steel	P0	Low-Carbon Steels, Long Chipping (C < .25%) Ex. A36, 1008, 1010, 1018, 1108, 1117 Brinell Hardness HB <125	<530	1760	1550	1370	1640	1445	1280	1400	1245	855	1215	790	655	655	525	400
	P1	Low-Carbon Steels, Short Chipping, Free Machining (C < .25%) Ex. 10L18, 1200 Series, 1213, 12L14 Brinell Hardness HB <125	<530	1500	1330	1120	1400	1245	1050	1180	1015	655	1015	590	525	600	475	360
	P2	Medium- and High-Carbon Steels (C > .25%) Ex. 1035, 1045, 10L45, 1080, 1137, 1144, 1525, 1572 Rockwell Hardness HRC <25	>530	1120	1050	950	1050	985	885	920	820	590	855	540	460	525	445	345
	P3	Alloy Steels and Tool Steels (C > .25%) Ex. P20, 1300, 2000, 3000, 4000, 5000, 8000, SAE A, D, H, O, S, M, T Rockwell Hardness HRC <35	600-850	1020	850	700	950	790	655	790	720	490	625	445	330	400	300	245
	P4	High-Strength Alloy Steels and Tool Steels (C > .25%) Ex. P20, 1300, 2000, 3000, 4000, 5000, 8000, SAE A, D, H, O, S, M, T Rockwell Hardness HRC 35 - 48	850-1400	850	700	560	790	655	525	590	525	330	460	300	230	310	245	180
	P5	Ferritic, Martensitic and PH Stainless Steels Ex. 13-8 PH, 15-5 PH, 17-4 PH, 400 and 500 Series Rockwell Hardness HRC <35	600-900	1050	880	700	985	820	655	855	720	560	625	460	330	420	320	260
	P6	High-Strength Ferritic, Martensitic and PH Stainless Steels Ex. 13-8 PH, 15-5 PH, 17-4 PH, 400 and 500 Series Rockwell Hardness HRC 35 - 48	900-1350	630	530	350	590	490	330	425	360	300	360	260	230	230	190	135

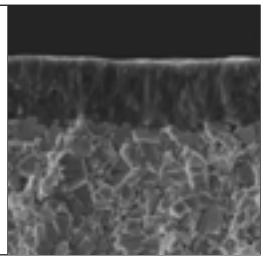
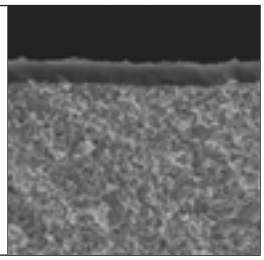
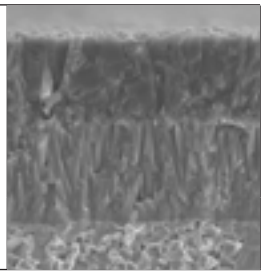
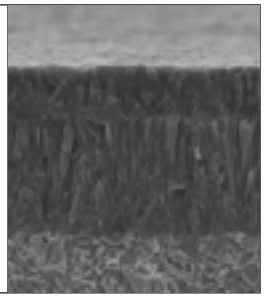
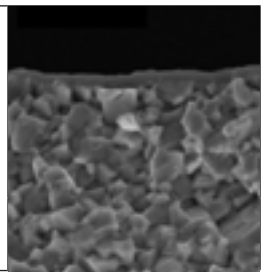
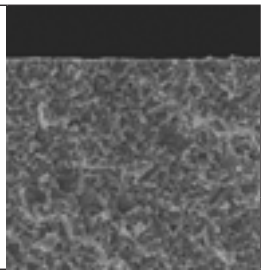
ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)											
						GS3115			GM1125			GM3125			GP3125		
						f_n (inch/rev)			f_n (inch/rev)			f_n (inch/rev)			f_n (inch/rev)		
						.004	.008	.012	.004	.008	.012	.004	.008	.012	.004	.008	.012
M Stainless Steel	M1	Austenitic Stainless Steels Ex. 200 Series, 301, 302, 304, 304L, 309	130-200		<600	770	625	490	790	655	525	755	600	475	470	380	300
	M2	High-Strength Austenitic Stainless and Cast Stainless Steels Ex. 310, 316, 316L, 321, 347, 384	150-230	<25	600-800	525	460	330	460	400	300	510	380	280	290	235	180
	M3	Duplex Stainless Steels Ex. 323, 329, F55, 2205	135-275	<30	<800	590	525	400	510	445	330	540	400	300	320	250	190

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)											
						GK1115			GK1125			GP3125					
						f_n (inch/rev)			f_n (inch/rev)			f_n (inch/rev)					
						.004	.008	.016	.004	.012	.020	.004	.008	.012			
K Cast Iron	K1	Gray Cast Iron Ex. Class 20, 25, 30, 35, 40, 45, 50, 55, 60, G1800, G3000, G3500, G4000	120-290	<32	125-500	1800	1180	885	1540	885	655	625	425	360			
	K2	Ductile Cast Irons (Nodular Irons) and Compacted Graphite Irons (CGI) Ex. 60-40-18, 65-45-12, 80-55-06, SAE J434: D4018, D4512, D5506	130-260	<28	<600	1215	885	690	885	655	490	525	380	330			
	K3	High-Strength Ductile Irons and Austempered Ductile Irons (ADI) Ex. ASTM A536: 100-70-03, 120-90-02, SAE J434: D7003	180-350	<43	>600	885	690	560	655	490	400	425	360	300			

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)											
						GN3125			GN9125								
						f_n (inch/rev)			f_n (inch/rev)								
						.004	.008	.016	.004	.008	.016						
N Non-Ferrous	N1	Wrought Aluminum Ex. 1000, 2017, 2025, 5050, 7050	60-90		<520	6900	5400	3600	6900	5400	3600						
	N2	Low-Silicon Aluminum Alloys (Si < 12.2%) Ex. 2024, 6061, 7075	70-100		<350	1640	985	655	1640	985	655						
	N3	High-Silicon Aluminum Alloys (Si > 12.2%)	60-120		200-320	985	655	400	985	655	400						
	N4	Copper and Copper Alloys Ex. C81500	60-200		200-650	1280	1050	885	1280	1050	885						

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)											
						GS3115											
						f_n (inch/rev)											
						.004	.008	.012									
		Iron-Based Heat-Resistant Alloys Ex. A286, A608, INCOLOY 800 Series, N-155, Haynes 556, Discaloy	160-260	25-48	500-1200	330	280	230									
		Cobalt-Based Heat-Resistant Alloys Ex. Haynes 25 (L605), Haynes 188, Stellite, MAR-M302, MAR-M509	250-450	25-48	1000-1450	260	215	165									
		Nickel-Based Heat-Resistant Alloys Ex. Astroloy, Hastelloy X, INCONEL 600 and 700 Series, Waspalloy	160-450	<48	600-1700	200	150	115									
		Titanium and Titanium Alloys Ex. Commercially Pure Ti, Ti-5Al-2.5Sn, Ti-6Al-4V, Ti-3Al-8V-6Cr-4Zr-4Mo	300-400	33-48	900-1600	-	-	-									

Grade / Application Area	Description	Microstructure
GP1105 **Super-Finishing to Finishing** **P STEEL**	"First Choice" for **Super-Finishing** Applications in Steel (ISO P Materials). Outstanding combination of deformation-resistance and insert edge strength. Gradient-sintered high-performance cemented carbide substrate with unsurpassed wear resistance. Double-Coated MT-CVD Grade with TiCN and Al_2O_3 layers. Exceptional coating adhesion properties. Withstands elevated operating temperatures.	
GP1115 **Finishing and Semi-finishing** **P STEEL**	*"First Choice"* for **Finishing** Applications in Steel (ISO P Materials). Triple-Coated MT-CVD Grade with Superfine TiCN, Thick Al_2O_3, and Ultra-Smooth TiN. Gradient-sintered high performance cemented carbide substrate with very high wear resistance. Performs extremely well in continuous cutting conditions and stable set-ups.	
GP1225 **Semi-finishing to Light Roughing** **P STEEL**	*"First Choice"* for **Medium** Turning Applications in Steel w(ISO P Materials). Triple-Coated MT-CVD Grade with Superthick TiCN, Optimized Al_2O_3, and Ultra-Smooth TiN. Gradient-sintered all-round performance cemented carbide substrate with excellent balance of wear resistance and toughness. Covers a wide application range, from semi-finishing to light roughing of Steels and continuous cutting to moderate interruptions. Also recommended for workpieces with scale.	
GP1135 **Medium Machining to Roughing** **P STEEL**	*"First Choice"* for difficult **Roughing** Applications in Steel (ISO P Materials). Superior fracture toughness and wear resistance. MT-CVD Triple-Layer Coating with smooth surface and excellent fracture resistance. Gradient-sintered high performance cemented carbide substrate with exceptional toughness properties. Well suited for medium to heavy interrupted cuts and other unstable application conditions.	
GP3125 **Finishing to Light Roughing** **P M K**	Universal Turning Grade. Primary application in Steel, with wide performance range in multiple materials. TiAlN Nano-Structure PVD Coated grade. Sub-Micron carbide substrate with outstanding combination of wear resistance and toughness behavior. Excellent Choice for All-Round grade that performs in an extremely wide variety of workpiece materials.	
GS3115 **Super-Finishing to Finishing** **M STAINLESS STEEL**	*"First Choice"* Grade for **Finishing** Applications in Stainless Steel (ISO M Materials). Also suitable for finish turning iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys. PVD Advanced TiAlN Coated Grade with superior heat-resistance and oxidation-resistance properties. Extremely hard deformation-resistant micro-grain cemented carbide substrate with exceptional wear resistance characteristics.	

Grade / Application Area	Description	Microstructure
GM1125 **Finishing to Medium Machining** **M STAINLESS STEEL**	*"First Choice"* Grade for Stainless Steel (ISO M Materials). Double-Coated MT-CVD Grade with outstanding adhesion of Superthick TiCN and Ultra-Smooth TiN. Gradient-sintered tough cemented carbide substrate with excellent wear resistance - even at elevated cutting speeds. Optimized for Stainless Steel machining including light interruptions.	
GM3125 **Semi-finishing to Roughing** **M STAINLESS STEEL**	TiAlN Nano-Structure PVD Coated grade on Superfine Sub-Micron carbide substrate - exceptional resistance to thermal and mechanical shock with very good wear resistance. Excellent Choice for Stainless Steel applications at moderate cutting speeds, continuous cutting to moderate interruptions.	
GK1115 **Finishing and Semi-finishing** **K CAST IRON**	*"First Choice"* for **Finishing** Applications in Cast Iron (ISO K Materials). Double-Coated MT-CVD Grade, Thick TiCN and Superthick Al_2O_3 on gradient-sintered high performance cemented carbide substrate. Unique "post-coating treatment" provides smoother cutting zone interface for extremely high wear resistance. Performs very well in continuous cutting conditions and stable set-ups.	
GK1125 **Semi-finishing to Roughing** **K CAST IRON**	*"First Choice"* for **Medium** Turning Applications in Cast Iron (ISO K Materials). Double-Coated MT-CVD Grade, Superthick TiCN and Thick Al_2O_3 . Gradient-sintered cemented carbide substrate with high wear resistance and superior toughness behavior. Covers a wide application range, from semi-finishing to roughing of Cast Iron - and continuous cutting to heavy interruptions. Performs well in poor machining conditions / on demanding castings.	
GN3125 **Semi-finishing to Roughing** **N NON-FERROUS**	PVD TiBC Coating paired with High Hardness and Wear Resistant Sub-Micron cemented carbide substrate developed specifically for Aluminum Alloys and other non-ferrous materials within the ISO N Material range. Extremely smooth top coating layer results in reduced surface friction and smooth chip flow. Also suitable for non-metallics.	
GN9125 **Semi-finishing to Roughing** **N NON-FERROUS**	Uncoated Sub-Micron cemented carbide grade. High Hardness and Wear Resistance grade developed specifically for Aluminum Alloys and other non-ferrous materials within the ISO N Material range. Also suitable for non-metallics.	

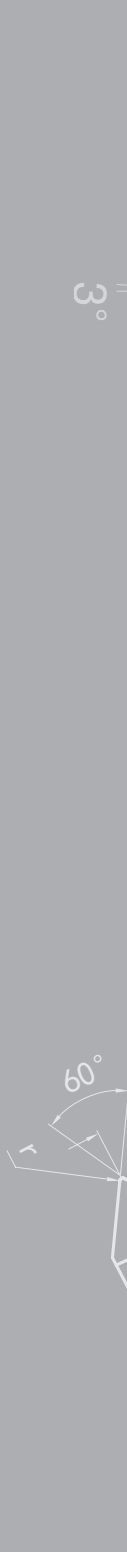
WEAR MECHANISM / PROBLEM	REMEDY										
	Increase the cutting speed	Reduce the cutting speed	Increase the feed	Reduce the feed	Increase the depth of cut	Reduce the depth of cut	Ensure adequate coolant flow	Choose a tougher grade	Select a more wear resistant grade	Choose a positive geometry	Use a smaller nose radius
Excessive flank wear		■	■				■		■		
Chipping				■				■			
Plastic deformation		■		■		■	■		■		
Crater wear		■		■			■		■	■	
Built-up-edge (BUE)	■			■			■			■	
Thermal cracks	■			■				■			
Notch wear		■					■		■		
Insert Breakage				■		■		■			
Vibrations		■	■			■				■	■
Chip control / long, unbroken chips			■		■						■

Increase the cutting speed | Reduce the cutting speed | Increase the feed | Reduce the feed | Increase the depth of cut | Reduce the depth of cut | Ensure adequate coolant flow | Choose a tougher grade | Select a more wear resistant grade | Choose a positive geometry | Use a smaller nose radius

REMEDY

GROOVING INSERTS | POSITIVE RAKE
THREADING INSERTS | POSITIVE RAKE

STANDARD NOTCH INSERTS
FOR GROOVING AND THREADING

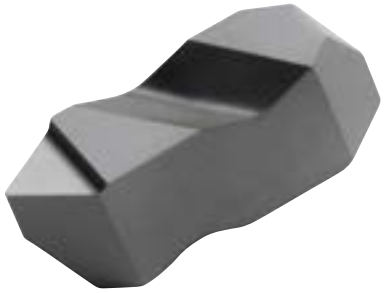


STANDARD NOTCH INSERTS

Precision ground for high performance and accurate indexing

Specialized edge treatment for extended tool life

5° positive rake - reduced cutting forces



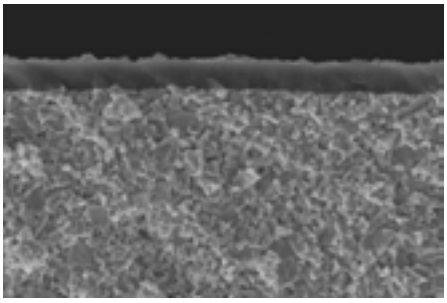
Two cutting edges per insert for economy

General purpose grooving, O-ring grooves, Circlip grooves

60° partial profile V-thread forms for a range of thread pitches

GM3125

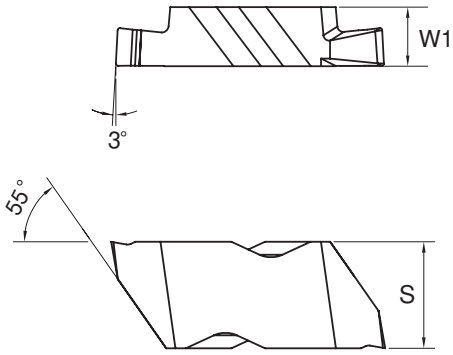
TiAlN Nano-Structure PVD Coated Grade



High resistance to thermal and mechanical shock, with exceptional wear resistance – provides superior performance in steel, stainless steel and cast iron materials.

P	M	K

G-NOTCH Insert Dimensions



Insert Size	W1	s
2	.150	.219
3	.195	.344

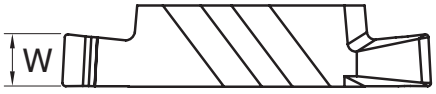
G	N	G	P	2	0	4	7	R
1		2	3	4	5			6

G	N	T	P	2	R
1		2	3	4	6

1	
Insert Type	
GN	G-NOTCH Grooving System

3	
Insert Characteristics	
P	Positive Rake

5	
Grooving Width	



Symbol indicates width W in thousandths of an inch

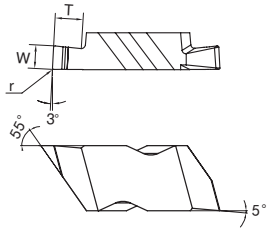
Symbol	W (inch)
047	.047
062	.062
078	.078
094	.094
125	.125

2	
Insert Style	
G	Grooving
T	Threading - 60° V-form

4	
Insert Size	
2	Notch size 2
3	Notch size 3

6	
Hand of Insert	
R	Right-hand
L	Left-hand

GNGP



Precision ground, positive rake Notch inserts for a wide range of grooving applications.

5° positive rake for improved cutting action and reduced cutting forces.

CATALOG NUMBER		INSERT SIZE	DIMENSIONS (INCH)			CUTTING DATA (INCH)		P	M	K
RIGHT HAND	LEFT HAND		W	T	r	depth of cut, a_p	feed per rev, f_n	MULTI-MATERIAL GM3125		
GNGP 2047R	**GNGP 2047L**	2	.047	.050	.004	max .050	.001-.005	★		
GNGP 2062R	**GNGP 2062L**	2	.062	.110	.008	max .110	.001-.006	★		
GNGP 2078R	**GNGP 2078L**	2	.078	.110	.008	max .110	.002-.008	★		
GNGP 2094R	**GNGP 2094L**	2	.094	.110	.008	max .110	.002-.008	★		
GNGP 2125R	**GNGP 2125L**	2	.125	.110	.008	max .110	.003-.010	★		
GNGP 3047R	**GNGP 3047L**	3	.047	.075	.008	max .075	.001-.006	★		
GNGP 3062R	**GNGP 3062L**	3	.062	.094	.008	max .094	.001-.006	★		
GNGP 3078R	**GNGP 3078L**	3	.078	.094	.008	max .094	.002-.008	★		
GNGP 3094R	**GNGP 3094L**	3	.094	.150	.008	max .150	.002-.008	★		
GNGP 3125R	**GNGP 3125L**	3	.125	.150	.008	max .150	.003-.010	★		

Ordering Example: 20 pcs GNGP 3125R GM3125

NOTE: Right-hand insert shown; Left-hand mirror image.

INSERT COMPATIBILITY

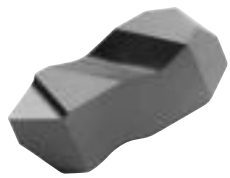
G-Notch GNGP grooving inserts are interchangeable with other Notch grooving inserts, and also fit tools using the following insert types:

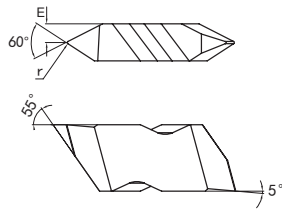
NG, NGP, NG-K	FLG, FLGP, FLG-CB	TLG, TLGP

REFERENCE PAGES

GRADE INFORMATION	72	TECHNICAL INFORMATION	72	CUTTING SPEED RECOMMENDATIONS	76

GNTP





Precision ground, positive rake Notch inserts for 60° partial profile (non-cresting) V-thread forms across a range of materials.

5° positive rake for improved cutting action and reduced cutting forces.

CATALOG NUMBER		INSERT SIZE	DIMENSIONS (INCH)		THREADS PER INCH		THREAD PITCH		P M K
					TPI		mm		MULTI-MATERIAL
RIGHT HAND	LEFT HAND		E	r	EXTERNAL	INTERNAL	EXTERNAL	INTERNAL	GM3125
GNTP 2R	**GNTP 2L**	2	.075	.004	36 - 8	20 - 7	0.70 - 3.00	1.25 - 3.50	★
GNTP 3R	**GNTP 3L**	3	.098	.007	20 - 6	12 - 5	1.25 - 4.00	2.00 - 5.00	★

Ordering Example: 20 pcs GNTP 3R GM3125

NOTE: Right-hand insert shown; Left-hand mirror image.

INSERT COMPATIBILITY

G-Notch GNTP threading inserts are interchangeable with other Notch threading inserts, and also fit tools using the following insert types:

NT, NTP, NT-K	FLT, FLTP, FLT-CB	TLT, TLTP

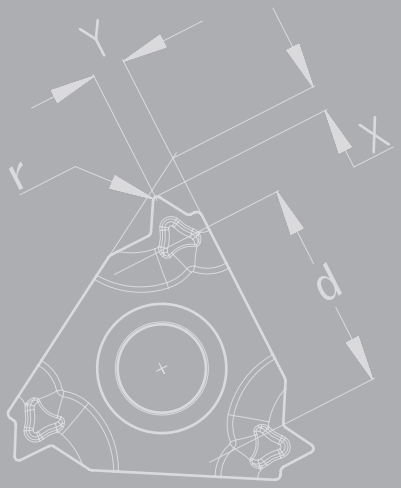
REFERENCE PAGES

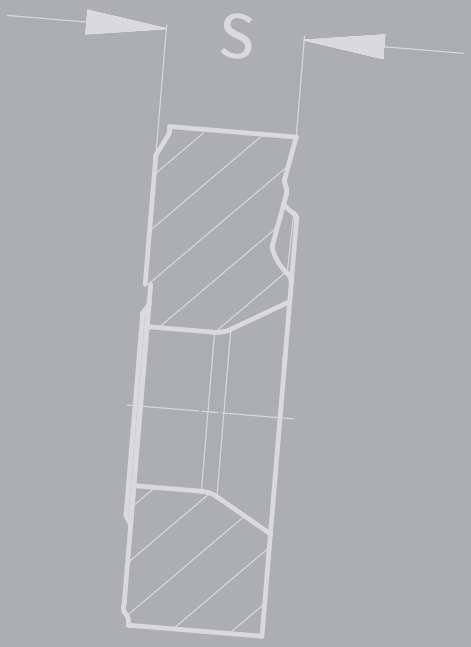
GRADE INFORMATION	72	TECHNICAL INFORMATION	72	CUTTING SPEED RECOMMENDATIONS	76

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)								
						GM3125								
						f_n (inch/rev)								
						.003	.006	.010						
P Steel	P0	Low-Carbon Steels, Long Chipping (C < .25%) Ex. A36, 1008, 1010, 1018, 1108, 1117	<125		<530	525	440	360						
	P1	Low-Carbon Steels, Short Chipping, Free Machining (C < .25%) Ex. 10L18, 1200 Series, 1213, 12L14	<125		<530	460	410	345						
	P2	Medium- and High-Carbon Steels (C > .25%) Ex. 1035, 1045, 10L45, 1080, 1137, 1144, 1525, 1572	<220	<25	>530	400	360	300						
	P3	Alloy Steels and Tool Steels (C > .25%) Ex. P20, 1300, 2000, 3000, 4000, 5000, 8000, SAE A, D, H, O, S, M, T	<330	<35	600-850	345	310	230						
	P4	High-Strength Alloy Steels and Tool Steels (C > .25%) Ex. P20, 1300, 2000, 3000, 4000, 5000, 8000, SAE A, D, H, O, S, M, T	340-450	35-48	850-1400	300	250	200						
	P5	Ferritic, Martensitic and PH Stainless Steels Ex. 13-8 PH, 15-5 PH, 17-4 PH, 400 and 500 Series	<330	<35	600-900	360	330	280						
	P6	High-Strength Ferritic, Martensitic and PH Stainless Steels Ex. 13-8 PH, 15-5 PH, 17-4 PH, 400 and 500 Series	340-450	35-48	900-1350	280	230	200						
M Stainless Steel	M1	Austenitic Stainless Steels Ex. 200 Series, 301, 302, 304, 304L, 309	130-200		<600	460	400	330						
	M2	High-Strength Austenitic Stainless and Cast Stainless Steels Ex. 310, 316, 316L, 321, 347, 384	150-230	<25	600-800	400	330	280						
	M3	Duplex Stainless Steels Ex. 323, 329, F55, 2205	135-275	<30	<800	430	350	300						
K Cast Iron	K1	Gray Cast Iron Ex. Class 20, 25, 30, 35, 40, 45, 50, 55, 60, G1800, G3000, G3500, G4000	120-290	<32	125-500	920	720	560						
	K2	Ductile Cast Irons (Nodular Irons) and Compacted Graphite Irons (CGI) Ex. 60-40-18, 65-45-12, 80-55-06, SAE J434: D4018, D4512, D5506	130-260	<28	<600	690	540	425						
	K3	High-Strength Ductile Irons and Austempered Ductile Irons (ADI) Ex. ASTM A536: 100-70-03, 120-90-02, SAE J434: D7003	180-350	<43	>600	490	360	260						

LAYDOWN THREADING INSERTS

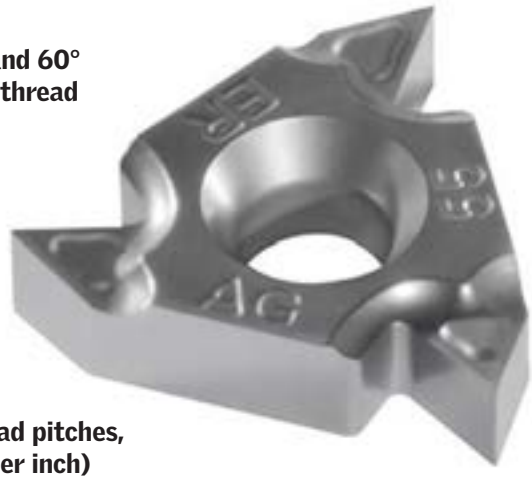
STANDARD INSERTS
FOR THREAD TURNING





STANDARD THREAD TURNING INSERTS

Inserts for 55° and 60° partial profile V-thread forms

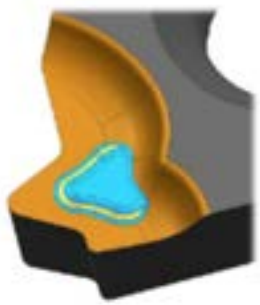


Standard insert sizes 11, 16 and 22

Broad range of thread pitches, 48-5 TPI (threads per inch)

Inserts for External and Internal applications

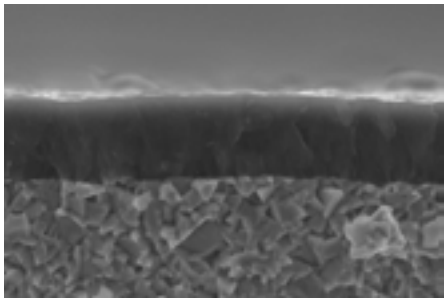
TC chipbreaker



- Superior chip control
- Reduced cutting forces
- Large chip space promotes smooth chip evacuation

GM3225

TiAlN Nano-Structure PVD Coated Grade



Optimized coating with gradient-sintered tough cemented carbide substrate provides superior wear resistance and exceptional performance for thread turning across a broad range of materials.

P	M	K	

16	E	R	–	A	55
1	2	3		4	5

1	
Insert Size	
Size	iC
11	.250
16	.375
22	.500

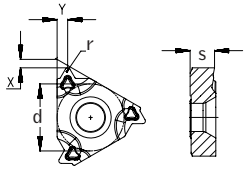
2	
Insert Type	
E	External
I	Internal

3	
Hand of Insert	
R	Right-hand

4		
Pitch		
Partial Profile		
Designation	TPI	mm
A	48 - 16	0.5 - 1.5
AG	48 - 8	0.5 - 3.0
G	14 - 8	1.75 - 3.0
N	7 - 5	3.5 - 5.0

5	
Thread Form	
55	Partial Profile 55°
60	Partial Profile 60°

PARTIAL PROFILE 60° - EXTERNAL



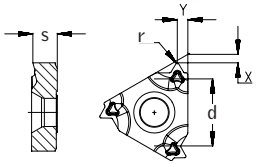
Standard inserts for 60° partial profile (non-cresting) V-thread forms across a range of materials. Three cutting edges for economy.

Special chipbreaker design with low cutting forces and superior chip control. Large chip space promotes smooth chip evacuation.

CATALOG NUMBER	THREADS PER INCH	THREAD PITCH	DIMENSIONS (INCH)					MULTI-MATERIAL P M K
	TPI	mm	d	s	r	X	Y	GM3225
16ER-A60-TC	48 - 16	0.50 - 1.50	3/8	.137	.003	.031	.035	★
16ER-AG60-TC	48 - 8	0.50 - 3.00	3/8	.137	.003	.043	.059	★
16ER-G60-TC	14 - 8	1.75 - 3.00	3/8	.137	.010	.047	.067	★
22ER-N60-TC	7 - 5	3.50 - 5.00	1/2	.185	.020	.067	.098	★

Ordering Example: 20 pcs 22ER-N60-TC GM3225

PARTIAL PROFILE 60° - INTERNAL



Standard inserts for 60° partial profile (non-cresting) V-thread forms across a range of materials. Three cutting edges for economy.

Special chipbreaker design with low cutting forces and superior chip control. Large chip space promotes smooth chip evacuation.

CATALOG NUMBER	THREADS PER INCH	THREAD PITCH	DIMENSIONS (INCH)					MULTI-MATERIAL P M K
	TPI	mm	d	s	r	X	Y	GM3225
11IR-A60-TC	48 - 16	0.50 - 1.50	1/4	.118	.003	.031	.035	★
16IR-A60-TC	48 - 16	0.50 - 1.50	3/8	.137	.003	.031	.035	★
16IR-AG60-TC	48 - 8	0.50 - 3.00	3/8	.137	.003	.043	.059	★
16IR-G60-TC	14 - 8	1.75 - 3.00	3/8	.137	.005	.047	.067	★
22IR-N60-TC	7 - 5	3.50 - 5.00	1/2	.185	.010	.067	.098	★

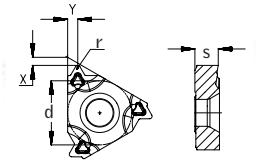
Ordering Example: 20 pcs 22IR-N60-TC GM3225

FULL PROFILE INSERTS

Many full profile thread turning inserts are also available, including the forms below. Ask for details.

BSPT - British Standard Pipe Taper ISO - ISO Metric NPT - National Pipe Taper
UN - Unified National Fixed Pitch W - Whitworth

PARTIAL PROFILE 55° - EXTERNAL



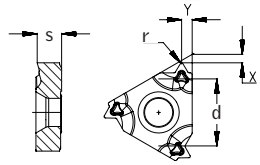
Standard inserts for 55° partial profile (non-cresting) V-thread forms across a range of materials. Three cutting edges for economy.

Special chipbreaker design with low cutting forces and superior chip control. Large chip space promotes smooth chip evacuation.

CATALOG NUMBER	THREADS PER INCH	THREAD PITCH	DIMENSIONS (INCH)					MULTI-MATERIAL P M K
	TPI	mm	d	s	r	X	Y	GM3225
16ER-A55-TC	48 - 16	0.50 - 1.50	3/8	.137	.003	.031	.035	★
16ER-AG55-TC	48 - 8	0.50 - 3.00	3/8	.137	.003	.043	.059	★
16ER-G55-TC	14 - 8	1.75 - 3.00	3/8	.137	.008	.047	.067	★
22ER-N55-TC	7 - 5	3.50 - 5.00	1/2	.185	.017	.067	.098	★

Ordering Example: 20 pcs 22ER-N55-TC GM3225

PARTIAL PROFILE 55° - INTERNAL



Standard inserts for 55° partial profile (non-cresting) V-thread forms across a range of materials. Three cutting edges for economy.

Special chipbreaker design with low cutting forces and superior chip control. Large chip space promotes smooth chip evacuation.

CATALOG NUMBER	THREADS PER INCH	THREAD PITCH	DIMENSIONS (INCH)					MULTI-MATERIAL P M K
	TPI	mm	d	s	r	X	Y	GM3225
11IR-A55-TC	48 - 16	0.50 - 1.50	1/4	.118	.003	.031	.035	★
16IR-A55-TC	48 - 16	0.50 - 1.50	3/8	.137	.003	.031	.035	★
16IR-AG55-TC	48 - 8	0.50 - 3.00	3/8	.137	.003	.043	.059	★
16IR-G55-TC	14 - 8	1.75 - 3.00	3/8	.137	.008	.047	.067	★
22IR-N55-TC	7 - 5	3.50 - 5.00	1/2	.185	.017	.067	.098	★

Ordering Example: 20 pcs 22IR-N55-TC GM3225

FULL PROFILE INSERTS

Many full profile thread turning inserts are also available, including the forms below. Ask for details.

BSPT - British Standard Pipe Taper ISO - ISO Metric NPT - National Pipe Taper
UN - Unified National Fixed Pitch W - Whitworth

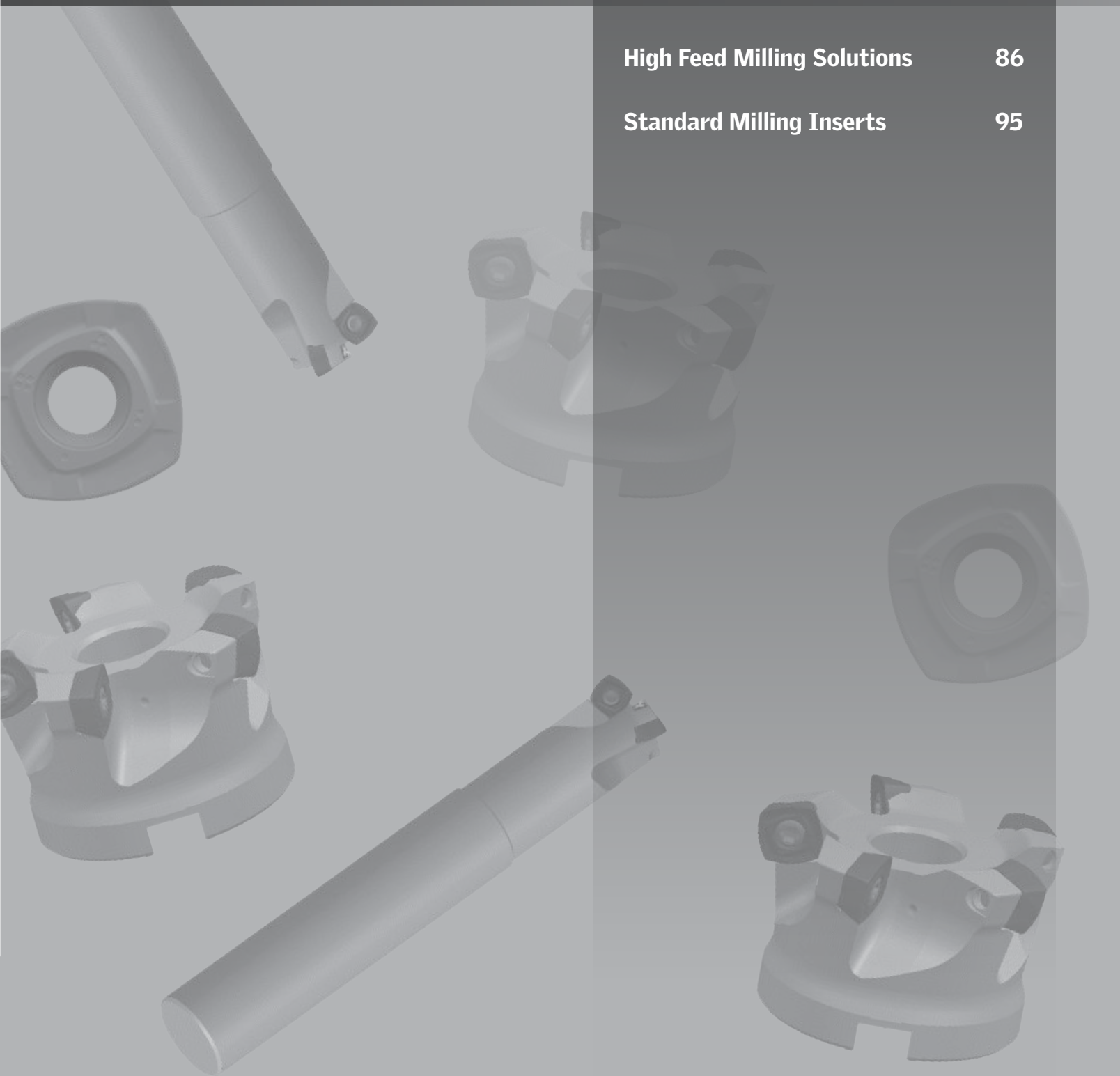
ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)											
						GM3225											
						low	start	high									
P Steel	P0	Low-Carbon Steels, Long Chipping (C < .25%) Ex. A36, 1008, 1010, 1018, 1108, 1117	<125		<530	390	560	760									
	P1	Low-Carbon Steels, Short Chipping, Free Machining (C < .25%) Ex. 10L18, 1200 Series, 1213, 12L14	<125		<530	330	490	640									
	P2	Medium- and High-Carbon Steels (C > .25%) Ex. 1035, 1045, 10L45, 1080, 1137, 1144, 1525, 1572	<220	<25	>530	300	440	580									
	P3	Alloy Steels and Tool Steels (C > .25%) Ex. P20, 1300, 2000, 3000, 4000, 5000, 8000, SAE A, D, H, O, S, M, T	<330	<35	600-850	250	330	460									
	P4	High-Strength Alloy Steels and Tool Steels (C > .25%) Ex. P20, 1300, 2000, 3000, 4000, 5000, 8000, SAE A, D, H, O, S, M, T	340-450	35-48	850-1400	160	270	360									
	P5	Ferritic, Martensitic and PH Stainless Steels Ex. 13-8 PH, 15-5 PH, 17-4 PH, 400 and 500 Series	<330	<35	600-900	260	400	540									
	P6	High-Strength Ferritic, Martensitic and PH Stainless Steels Ex. 13-8 PH, 15-5 PH, 17-4 PH, 400 and 500 Series	340-450	35-48	900-1350	140	180	260									

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)											
						GM3225											
						low	start	high									
M Stainless Steel	M1	Austenitic Stainless Steels Ex. 200 Series, 301, 302, 304, 304L, 309	130-200		<600	300	380	470									
	M2	High-Strength Austenitic Stainless and Cast Stainless Steels Ex. 310, 316, 316L, 321, 347, 384	150-230	<25	600-800	180	240	320									
	M3	Duplex Stainless Steels Ex. 323, 329, F55, 2205	135-275	<30	<800	190	260	340									

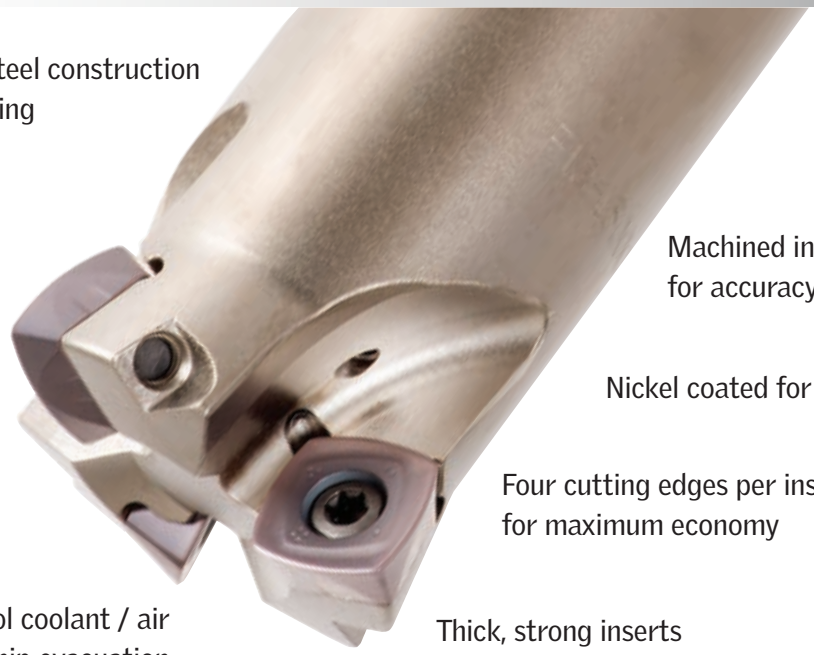
ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)											
						GM3225											
						low	start	high									
K Cast Iron	K1	Gray Cast Iron Ex. Class 20, 25, 30, 35, 40, 45, 50, 55, 60, G1800, G3000, G3500, G4000	120-290	<32	125-500	260	350	490									
	K2	Ductile Cast Irons (Nodular Irons) and Compacted Graphite Irons (CGI) Ex. 60-40-18, 65-45-12, 80-55-06, SAE J434: D4018, D4512, D5506	130-260	<28	<600	220	300	400									
	K3	High-Strength Ductile Irons and Austempered Ductile Irons (ADI) Ex. ASTM A536: 100-70-03, 120-90-02, SAE J434: D7003	180-350	<43	>600	200	260	320									

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)											
						GM3225											
						low	start	high									
		Iron-Based Heat-Resistant Alloys Ex. A286, A608, INCOLOY 800 Series, N-155, Haynes 556, Discaloy	160-260	25-48	500-1200	90	130	180									
		Cobalt-Based Heat-Resistant Alloys Ex. Haynes 25 (L605), Haynes 188, Stellite, MAR-M302, MAR-M509	250-450	25-48	1000-1450	60	80	100									
		Nickel-Based Heat-Resistant Alloys Ex. Astroloy, Hastelloy X, INCONEL 600 and 700 Series, Waspalloy	160-450	<48	600-1700	45	60	80									
		Titanium and Titanium Alloys Ex. Commercially Pure Ti, Ti-5Al-2.5Sn, Ti-6Al-4V, Ti-3Al-8V-6Cr-4Zr-4Mo	300-400	33-48	900-1600	165	200	230									

MILLING



HIGH FEED MILLING SOLUTIONS



High quality alloy tool steel construction for strong and long-lasting cutter bodies

Machined in pre-hardened state for accuracy and low runout

High precision cutter bodies provide consistent performance and tool life

Nickel coated for durability

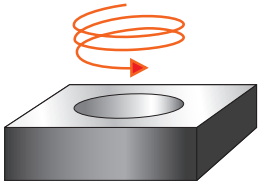
Four cutting edges per insert for maximum economy

Through-the-tool coolant / air capability for excellent chip evacuation

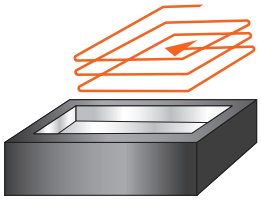
Thick, strong inserts for demanding applications

VERSATILITY | HIGH PERFORMANCE IN A VARIETY OF APPLICATIONS

Face Milling

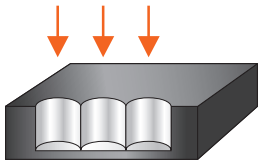


Helical Milling



Pocketing

Ramping

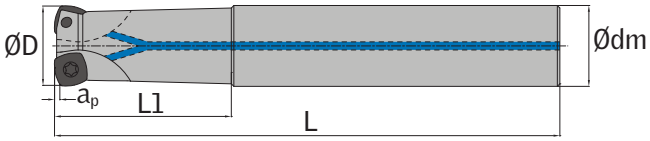


Plunging

SUITABLE FOR A BROAD RANGE OF MATERIALS

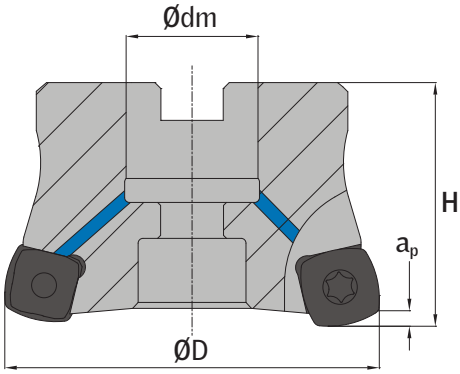
P	Steel
M	Stainless Steel
K	Cast Iron
S	High Temp Alloys
H	Hardened Steel

ENDMILLS - CYLINDRICAL SHANK



DIAMETER D	CATALOG NUMBER	NUMBER OF INSERTS z	SHANK DIAMETER dm	OVERALL LENGTH L	NECK LENGTH L1	MAX DEPTH OF CUT a_p	COOLANT THROUGH
1.250	HF13-1250C1250-12Z02	2	1.250	10.00	2.50	.078	YES
1.500	HF13-1500C1250-12Z03	3	1.250	10.00	-	.078	YES

FACEMILLS - ARBOR MOUNT



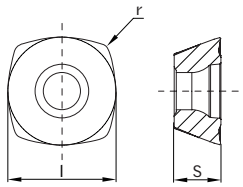
DIAMETER D	CATALOG NUMBER	NUMBER OF INSERTS z	MOUNTING BORE DIAMETER dm	HEIGHT H	MAX DEPTH OF CUT a_p	COOLANT THROUGH
2.000	HF13-2000A0750-12Z04	4	0.750	1.58	.078	YES
2.500	HF13-2500A0750-12Z05	5	0.750	1.58	.078	YES
3.000	HF13-3000A1000-12Z06	6	1.000	1.97	.078	YES
4.000	HF13-4000A1250-12Z08	8	1.250	1.97	.078	YES
5.000	HF13-5000A1500-12Z10	10	1.500	2.48	.078	YES

Ordering Example: 2 pcs HF13-5000A1500-12Z10

NOTE: All cutters are delivered with insert mounting screws and a wrench. Inserts are ordered separately - see page 88.
See page 93 for Spare Parts information.

HIGH FEED MILLING

SDMT



Versatile inserts for high feed facemilling, plunging, ramping and pocketing applications. Thick, strong inserts with four cutting edges for maximum economy.

GM: Medium machining with lower cutting forces
GH: Roughing with highest edge security

APPLICATION	ITEM	CATALOG NUMBER	DIMENSIONS (INCH)			MULTI-MATERIAL				P	M		
			l	s	r	GA4225	GA4230			GP2115	GM2140	GS4130	
MEDIUM		**SDMT 120512-GM**	.500	.219	.047	★	★			★	★	★	
HEAVY		**SDMT 120512-GH**	.500	.219	.047	★	★			★	★		

Ordering Example: 20 pcs SDMT 120512-GH GA4230

GRADE INFORMATION

GA4230 P M K S H

Universal, first-choice grade with broad application range. PVD TiAlN+ coating with excellent heat and oxidation resistance characteristics.

GA4225 P M K

Complementary grade for steel, stainless steel and cast iron materials. PVD AlCrN coating with high hardness substrate offers increased wear resistance.

GP2115 P

Best for steel machining with stable set-ups. MT-CVD dual layer TiCN and Al_2O_3 coating with extremely hard substrate offers high wear resistance.

GM2140 M

Outstanding performance in austenitic and ferritic, martensitic and PH stainless steels. MT-CVD coated grade with secondary application in titanium and HRSA materials.

GS4130 S

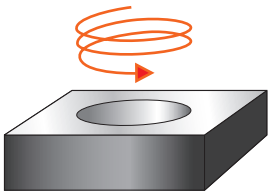
Primary application in titanium and iron-based, cobalt-based and nickel-based heat resistant alloys. Latest PVD TiAlN coating technology with complementary use in stainless steels.

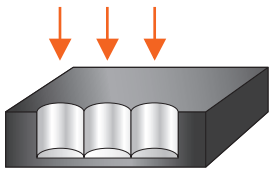
REFERENCE PAGES					
MILLING CUTTERS	87	FEED RECOMMENDATIONS	89	CUTTING SPEED RECOMMENDATIONS	90

ISO	Workpiece Material	Rockwell Hardness HRC	Recommended feed per insert f_z (inches) starting (range)	
			GM (medium)	GH (heavy)
P Steel	Low-Carbon Steel	<25	.045 (.030 - .060)	.060 (.040 - .080)
	Alloy Steel and Tool Steel	<35	.045 (.030 - .060)	.060 (.040 - .080)
	Alloy Steel and Tool Steel	35 - 45	.035 (.025 - .050)	.045 (.030 - .060)
M Stainless Steel	Stainless Steel	<35	.030 (.025 - .040)	.040 (.030 - .050)
K Cast Iron	Cast Iron	<35	.045 (.030 - .060)	.060 (.040 - .080)
S High-Temp Alloys	Heat-Resistant and Titanium Alloys	<35	.015 (.006 - .024)	.020 (.008 - .036)
H Hardened Steel	Alloy Steel and Tool Steel	45 - 55	.010 (.004 - .020)	.015 (.006 - .030)

RECOMMENDED STARTING FEED VALUES RELATIVE TO DEPTH OF CUT	depth of cut a_p (inches)			
	.020	.040	.060	.078
Recommended feed per insert f_z (inches) starting (range)	.070 (.060 - .080)	.060 (.040 - .070)	.040 (.025 - .060)	.030 (.015 - .040)

OTHER APPLICATIONS





See pages 92 and 93 for feed recommendations for ramping, helical milling and plunging applications.

RECOMMENDED STARTING CUTTING SPEEDS / HIGH FEED MILLING

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)											
						GP2115			GA4225			GA4230			GM2140		
						f_z (inch)			f_z (inch)			f_z (inch)			f_z (inch)		
						.035	.050	.065	.035	.050	.065	.035	.050	.065	.030	.045	.055
P Steel	P0	Low-Carbon Steels, Long Chipping (C < .25%) Ex. A36, 1008, 1010, 1018, 1108, 1117	<125		<530	840	720	580	760	650	525	720	620	500			
	P1	Low-Carbon Steels, Short Chipping, Free Machining (C < .25%) Ex. 10L18, 1200 Series, 1213, 12L14	<125		<530	760	620	490	690	560	440	655	530	420			
	P2	Medium- and High-Carbon Steels (C > .25%) Ex. 1035, 1045, 10L45, 1080, 1137, 1144, 1525, 1572	<220	<25	>530	680	590	475	620	535	430	590	510	410			
	P3	Alloy Steels and Tool Steels (C > .25%) Ex. P20, 1300, 2000, 3000, 4000, 5000, 8000, SAE A, D, H, O, S, M, T	<330	<35	600-850	560	450	360	510	410	325	480	390	310			
	P4	High-Strength Alloy Steels and Tool Steels (C > .25%) Ex. P20, 1300, 2000, 3000, 4000, 5000, 8000, SAE A, D, H, O, S, M, T	340-450	35-48	850-1400	420	335	265	380	305	240	360	290	230			
	P5	Ferritic, Martensitic and PH Stainless Steels Ex. 13-8 PH, 15-5 PH, 17-4 PH, 400 and 500 Series	<330	<35	600-900				605	525	420	575	500	400	545	475	380
	P6	High-Strength Ferritic, Martensitic and PH Stainless Steels Ex. 13-8 PH, 15-5 PH, 17-4 PH, 400 and 500 Series	340-450	35-48	900-1350				440	360	285	420	340	270	400	325	255

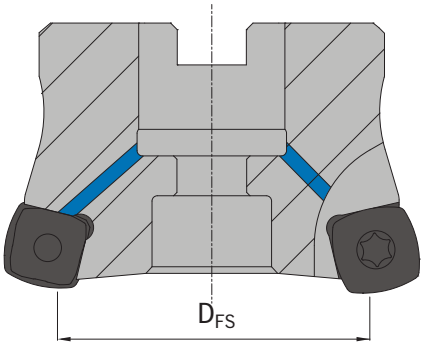
ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)											
						GA4225			GA4230			GS4130			GM2140		
						f_z (inch)			f_z (inch)			f_z (inch)			f_z (inch)		
						.025	.035	.045	.025	.035	.045	.025	.035	.045	.025	.035	.045
M Stainless Steel	M1	Austenitic Stainless Steels Ex. 200 Series, 301, 302, 304, 304L, 309	130-200		<600	595	550	515	565	525	490	540	500	465	540	500	465
	M2	High-Strength Austenitic Stainless and Cast Stainless Steels Ex. 310, 316, 316L, 321, 347, 384	150-230	<25	600-800	460	410	380	435	390	360	415	370	340	415	370	340
	M3	Duplex Stainless Steels Ex. 323, 329, F55, 2205	135-275	<30	<800	560	515	485	530	490	460	500	465	435	500	465	435

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)								
						GA4225			GA4230					
						f_z (inch)			f_z (inch)					
						.035	.050	.065	.035	.050	.065			
K Cast Iron	K1	Gray Cast Iron Ex. Class 20, 25, 30, 35, 40, 45, 50, 55, 60, G1800, G3000, G3500, G4000	120-290	<32	125-500	690	560	440	655	530	420			
	K2	Ductile Cast Irons (Nodular Irons) and Compacted Graphite Irons (CGI) Ex. 60-40-18, 65-45-12, 80-55-06, SAE J434: D4018, D4512, D5506	130-260	<28	<600	620	520	390	590	490	370			
	K3	High-Strength Ductile Irons and Austempered Ductile Irons (ADI) Ex. ASTM A536: 100-70-03, 120-90-02, SAE J434: D7003	180-350	<43	>600	550	470	360	525	450	345			

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)								
						GA4230			GS4130			GM2140		
						f_z (inch)			f_z (inch)			f_z (inch)		
						.008	.016	.024	.008	.016	.024	.008	.016	.024
S High Temp Alloys	S1	Iron-Based Heat-Resistant Alloys Ex. A286, A608, INCOLOY 800 Series, N-155, Haynes 556, Discaloy	160-260	25-48	500-1200	200	130	100	190	120	90	190	120	90
	S2	Cobalt-Based Heat-Resistant Alloys Ex. Haynes 25 (L605), Haynes 188, Stellite, MAR-M302, MAR-M509	250-450	25-48	1000-1450	170	100	80	160	90	70	160	90	70
	S3	Nickel-Based Heat-Resistant Alloys Ex. Astroloy, Hastelloy X, INCONEL 600 and 700 Series, Waspalloy	160-450	<48	600-1700	180	110	90	170	100	80	170	100	80
	S4	Titanium and Titanium Alloys Ex. Commercially Pure Ti, Ti-5Al-2.5Sn, Ti-6Al-4V, Ti-3Al-8V-6Cr-4Zr-4Mo	300-400	33-48	900-1600	190	120	95	180	110	85	180	110	85

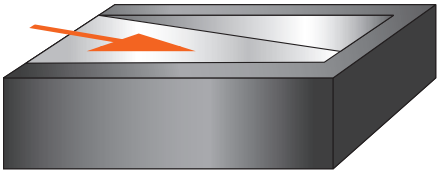
ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)								
						GA4230								
						f_z (inch)								
						.006	.012	.020						
H Hardened Steels	H1	Hardened Alloy Steels and Tool Steels Ex. H13,D2, D3, 4340,P20		44-48		320	260	210						
	H2	Hardened Alloy Steels and Tool Steels Ex. H13,D2, D3, 4340,P20		48-55		260	210	165						
	H3	Hardened Alloy Steels and Tool Steels Ex. H13,D2, D3, 4340,P20		56-60										
	H4	Hardened Alloy Steels and Tool Steels Ex. H13,D2, D3, 4340,P20		>60										

WIDTH OF CUT FOR FLAT SURFACES



CUTTER DIAMETER	D_{FS}
1.250	0.53
1.500	0.78
2.000	1.28
2.500	1.78
3.000	2.28
4.000	3.28
5.000	4.28

RAMPING



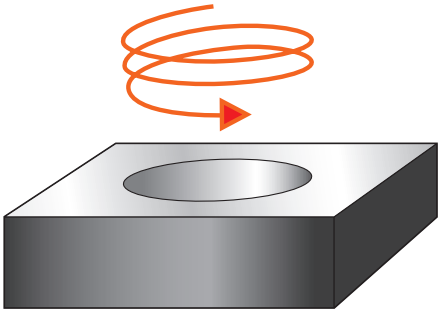
CUTTER DIAMETER	MAX RAMPING ANGLE
1.250	1.8°
1.500	1.5°
2.000	1.2°
2.500	0.9°
3.000	0.8°
4.000	0.6°
5.000	0.4°

FEED RECOMMENDATION
Reduce feed for ramping applications to 75% of normal value.

EXAMPLE: If the calculated face milling feed rate is 200 inches/min, reduce the feed rate for ramping to:

200 inches/min x 75% = 150 inches/min

HELICAL MILLING



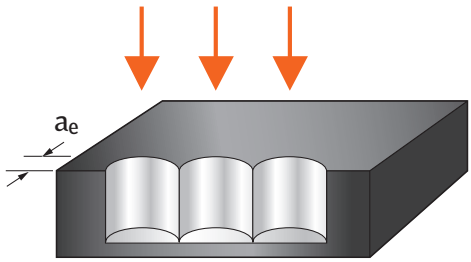
CUTTER DIAMETER	MINIMUM HOLE SIZE	MAXIMUM HOLE SIZE
1.250	1.71	2.42
1.500	2.21	2.92
2.000	3.21	3.92
2.500	4.21	4.92
3.000	5.21	5.92
4.000	7.21	7.92
5.000	9.21	9.92

FEED RECOMMENDATION
Reduce feed for helical milling applications to 30% - 50% of normal value.

EXAMPLE: If the calculated face milling feed rate is 200 inches/min, reduce the feed rate for helical milling to a range of:

200 inches/min x 30% = 60 inches/min
200 inches/min x 50% = 100 inches/min

PLUNGE MILLING

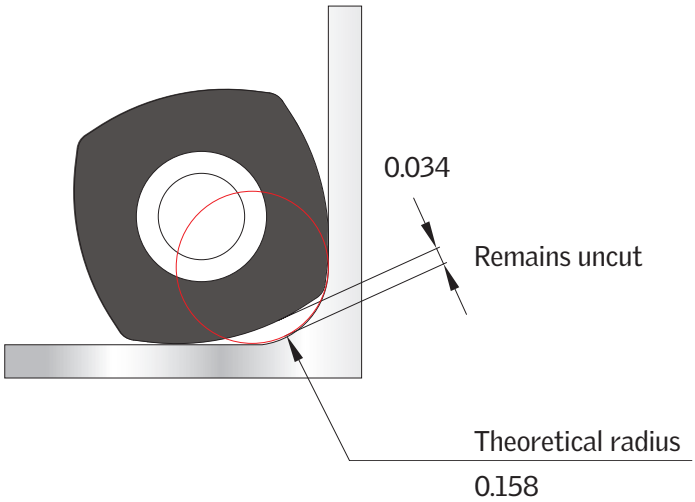


Maximum width of cut a_e = 0.330

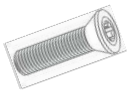
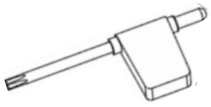
FEED RECOMMENDATION
Recommended starting feed per insert
f_z = .006 (.002-.010)

PROGRAMMING INFORMATION

CAD/CAM systems require a defined theoretical radius value when programming pocketing applications (cavity machining). The theoretical radius value is noted on the drawing to the right, as well as the approximate amount of material that will remain uncut.



SPARE PARTS

INSERT SCREW	WRENCH
	
NS521	FWT15

Spindle speed, n (rpm)

$$n = \frac{3.82 \times v_c}{D}$$

Cutting speed, v_c (ft / min)

$$v_c = .262 \times D \times n$$

Feed rate, v_f (in / min)

$$v_f = n \times f_z \times z$$

Feed per insert, f_z (in)

$$f_z = \frac{v_f}{n \times z}$$

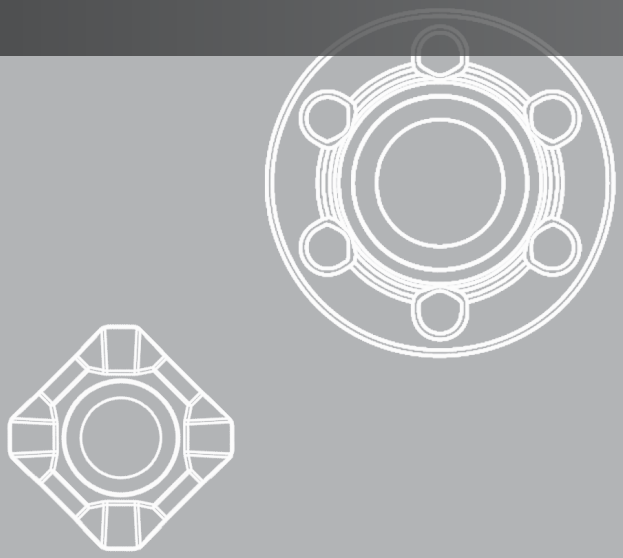
Metal removal rate, Q (in^3 / min)

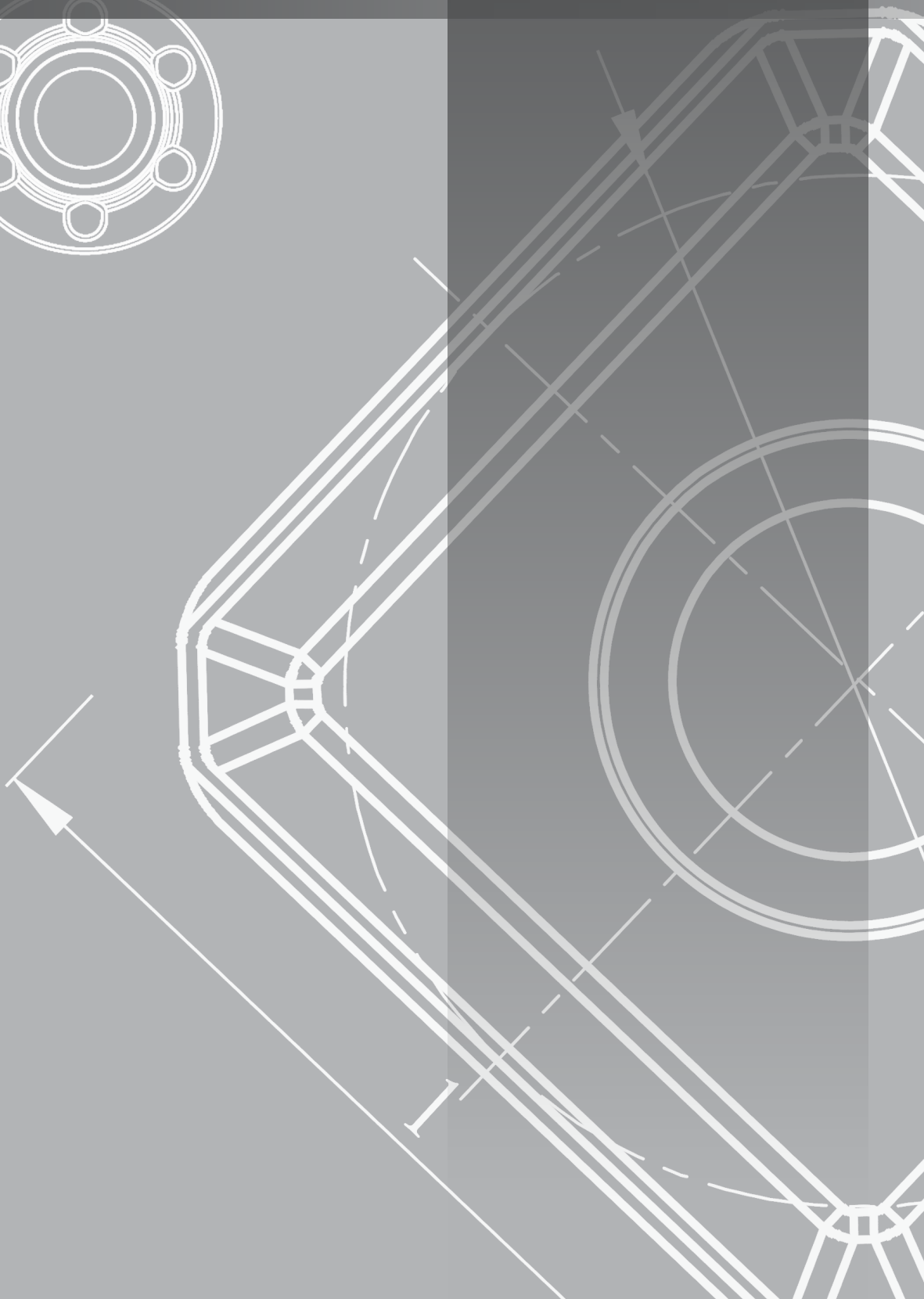
$$Q = a_e \times a_p \times v_f$$

a_e	width of cut	inches
a_p	depth of cut	inches
D	cutter diameter	inches
f_z	feed per insert	inches
n	spindle speed	rev/min
Q	metal removal rate	$inches^3$/min
v_c	cutting speed	feet/min
v_f	feed rate	inches/min
z	number of inserts	

MILLING INSERTS

INDUSTRY STANDARD INSERTS
FOR SQUARE SHOULDER, FACEMILLING
AND PROFILE MILLING APPLICATIONS





Grade GA4230

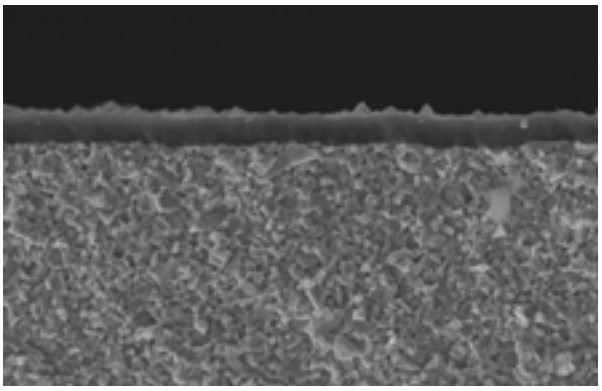
Superior Milling Performance in a Wide Range of Applications

Outstanding results in Steels, Stainless Steels, Cast Iron and Heat-Resistant Super Alloys

Withstands difficult cutting conditions – varying depths of cut, weak and unstable setups, vibrations

GA4230 - Advanced Substrate Development

- Homogeneous submicron grain structure
- Specialized processing treatment provides exceptional fracture-resistant properties and superior wear resistance
- Stable performance under a wide range of machining conditions



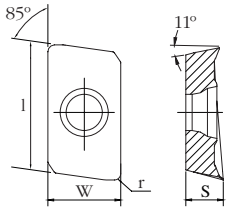
GA4230 - Next Generation Coating Technology

- New TiAlN+ Advanced PVD Coating
- Outstanding wear resistance properties and long tool life through improved microstructure and surface treatment
- Increased adhesion strength to substrate provides predictable tool life and reliable performance
- Effective in HRSA's and other difficult-to-machine materials due to high heat resistance and oxidation resistance characteristics

WORKPIECE MATERIAL	ANSI	ISO	Coating Type: PVD	
P Steel	C8, C7, C6	01, 10, 20, 30, 40	GA4230	wear resistance ↔ toughness
M Stainless Steel	–	01, 10, 20, 30	GA4230	wear resistance ↔ toughness
K Cast Iron	C4, C3, C2, C1	01, 10, 20, 30	GA4230	wear resistance ↔ toughness
	–	01, 10, 20, 30		wear resistance ↔ toughness

SQUARE SHOULDER MILLING

APMT



Widely used inserts for square shoulder endmilling and facemilling applications. Two cutting edges with smooth free cutting action.

PL: Light cutting with lowest cutting forces
PM: Medium machining with broad application range
PR: Roughing with highest edge security

APPLICATION	ITEM	CATALOG NUMBER	DIMENSIONS (INCH)				CUTTING DATA (INCH)		P M K
			l	W	s	r	depth of cut, a_p	feed per insert, f_z	MULTI-MATERIAL GA4230
LIGHT		**APMT 160408PDER-PL**	.640	.364	.187	.031	max .551	.002 - .006	★
MEDIUM		**APMT 160408PDER-PM**	.640	.364	.187	.031	max .551	.003 - .008	★
MEDIUM		**APMT 160416PDER-PM**	.640	.364	.187	.063	max .551	.003 - .008	★
HEAVY		**APMT 160408PDER-PR**	.640	.364	.187	.031	max .551	.006 - .012	★

Ordering Example: 20 pcs APMT 160408PDER-PR GA4230

INSERT COMPATIBILITY

APMT 1604 milling inserts are interchangeable with other APMT 1604 inserts, and also fit tools using the following insert types:

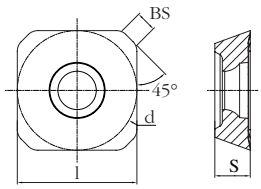
APKT 1604	APKT 263	APKX 1604	APMW 1604	APMX 1604

REFERENCE PAGES

GRADE INFORMATION	96	TECHNICAL INFORMATION	101	CUTTING SPEED RECOMMENDATIONS	104

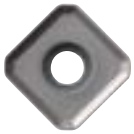
45° FACEMILLING

SEET



Very popular facemilling inserts, commonly used on low powered machines and smaller machining centers. High positive rake angles and geometries. Four cutting edges for economy.

PL: Light cutting with lowest cutting forces
PM: Medium machining with broad application range
PH: Heavy cutting with highest edge security

APPLICATION	ITEM	CATALOG NUMBER	DIMENSIONS (INCH)				CUTTING DATA (INCH)		P M K
			d	l	s	BS	depth of cut, a_p	*feed per insert, f_z	MULTI-MATERIAL GA4230
LIGHT		**SEET 13T3AGEN-PL**	.528	.528	.156	.067	max .240	.003 - .008	★
MEDIUM		**SEET 13T3AGEN-PM**	.528	.528	.156	.047	max .240	.004 - .012	★
HEAVY		**SEET 13T3AGSN-PH**	.528	.528	.156	.047	max .240	.006 - .016	★

Ordering Example: 20 pcs SEET 13T3AGSN-PH GA4230

***NOTE**: Feed per insert (f_z) values shown include feedrate multiplier to compensate for 45° lead angle chip thinning.

INSERT COMPATIBILITY

SEET 13T3 inserts are interchangeable with, and fit tools using, the following insert types:

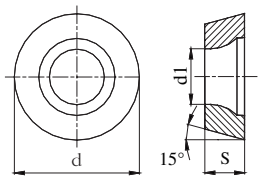
R245-12T3	SEET 13T3	SEGT 13T3	SEHT 13T3	SEKT 13T3	SEMT 13T3	SEPT 13T3

REFERENCE PAGES

GRADE INFORMATION	96	TECHNICAL INFORMATION	101	CUTTING SPEED RECOMMENDATIONS	104

PROFILE MILLING

RDET
RDMW



Industry standard profiling inserts with high performance grade and geometries. 15° clearance angle for wide variety of common industry cutters. Excellent value and economy.

BL: Light cutting with lowest cutting forces
GM: Medium machining with broad application range
T-BM, T: Roughing with highest edge security

APPLICATION	ITEM	CATALOG NUMBER	DIMENSIONS (INCH)			CUTTING DATA (INCH)		P M K
			d	d1	s	depth of cut, a_p	*feed per insert, f_z	MULTI-MATERIAL GA4230
LIGHT		**RDET 1204M0-BL**	12mm	.173	.187	max .236	.004 - .008	★
		RDET 1604M0-BL	16mm	.217	.187	max .315	.004 - .008	★
MEDIUM		**RDET 1204M0-GM**	12mm	.173	.187	max .236	.006 - .012	★
		RDET 1604M0-GM	16mm	.217	.187	max .315	.006 - .012	★
HEAVY		**RDMW 1204M0T-BM**	12mm	.173	.187	max .236	.008 - .016	★
HEAVY		**RDMW 1604M0T**	16mm	.217	.187	max .315	.008 - .016	★

Ordering Example: 20 pcs RDMW 1604M0T GA4230

***NOTE:** Proper feedrates for round inserts are dependent on the depth of cut. Feed per insert (f_z) values shown include a multiplier to compensate for chip thinning. Recommended feed values provided are for one-half the maximum depth of cut for each insert. For larger depths of cut decrease the feed; for smaller depths of cut increase the feed.

INSERT COMPATIBILITY

RDET and RDMW 1204 and 1604 inserts fit cutters using the same insert descriptions, and also fit tools using the following insert types:

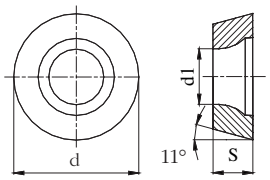
RDEW	RDEX	RDGT	RDHT	RDHW	RDHX	RDMT	RDPX

REFERENCE PAGES

GRADE INFORMATION	96	TECHNICAL INFORMATION	101	CUTTING SPEED RECOMMENDATIONS	104

PROFILE MILLING

RPET RPMW



Industry standard profiling inserts with high performance grade and geometries. 11° clearance angle for broad range of common industry cutters. Excellent value and economy.

GL: Light cutting with lowest cutting forces
GM: Medium machining with broad application range
T: Roughing with highest edge security

APPLICATION	ITEM	CATALOG NUMBER	DIMENSIONS (INCH)			CUTTING DATA (INCH)		P M K
			d	d1	s	depth of cut, a_p	*feed per insert, f_z	MULTI-MATERIAL GA4230
LIGHT		**RPET 1204M0-GL**	12mm	.173	.187	max .236	.004 - .008	★
MEDIUM		**RPET 1204M0-GM**	12mm	.173	.187	max .236	.006 - .012	★
HEAVY		**RPMW 1204M0T**	12mm	.173	.187	max .236	.008 - .016	★

Ordering Example: 20 pcs RPMW 1204M0T GA4230

***NOTE:** Proper feedrates for round inserts are dependent on the depth of cut. Feed per insert (f_z) values shown include a multiplier to compensate for chip thinning. Recommended feed values provided are for one-half the maximum depth of cut for each insert. For larger depths of cut decrease the feed; for smaller depths of cut increase the feed.

INSERT COMPATIBILITY

RPET and RPMW 1204 inserts fit cutters using the same insert descriptions, and also fit tools using the following insert types:

RPCT	RPCW	RPEW	RPEX	RPHT	RPMT

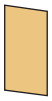
REFERENCE PAGES

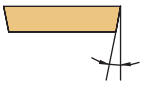
GRADE INFORMATION	96	TECHNICAL INFORMATION	101	CUTTING SPEED RECOMMENDATIONS	104

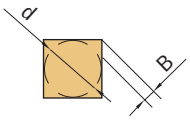
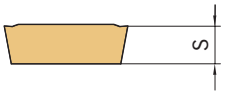
TECHNICAL INFORMATION
MILLING

EXAMPLE 1

A	P	M	T	16	04	08	P	D	E	R	-	PL
1	2	3	4	5	6	7	8	9	10	11		12

1		
Insert Shape		
A	85⁰ Parallelogram	
R	Round	
S	Square	

2	
Clearance Angle	
	
D	15⁰ Positive Rake
E	20⁰ Positive Rake
P	11⁰ Positive Rake

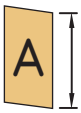
3			
Tolerances, inch			
			
Tolerance Class	tolerance on 'd'	tolerance on 'B'	tolerance on 's'
E	± .001	± .001	± .001
M	see table	see table	± .005

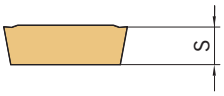
Tolerance Class M, inch		
d	**tolerance on 'd'**	**tolerance on 'B'**
3/8 (10mm)	± .002	± .003
1/2 (12mm)	± .003	± .005
5/8 (16mm)	± .004	± .006

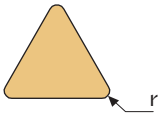
4		
Insert Type		
T	Screw-Down Clamping, Single-sided with Chipformer	
W	Screw-Down Clamping, Single-sided without Chipformer	
X	Manufacturer-Specific Design	——

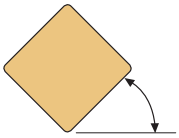
EXAMPLE 2

R	D	M	W	12	04	M0	T	-	BM
1	2	3	4	5	6	8	10		12

5			
Insert Size			
Nominal Cutting Edge Length, mm			
Symbol			
12		12	
13			13.4
16	16.4	16	

6	
Thickness, inch	
	
Symbol	s
T3	5/32
04	3/16

7	
Corner Radius, inch	
	
Symbol	r
08	1/32
16	1/16

8	
Cutting Edge Angle	
	
A	45⁰
P	90⁰
M0	round, metric sizes

9	
Secondary Cutting Edge Clearance Angle	
	
D	15⁰
G	30⁰

10		
Cutting Edge Preparation		
E	Honed	
S	Honed T-land	
T	T-land	

11	
Hand of Insert	
R	Right-hand
L	Left-hand
N	Neutral

12
Insert Geometry Designation
Indicates the machining properties or chipformer features Manufacturer-specific

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)								
						GA4230								
						f_z (inch)								
						.004	.008	.012						
P Steel	P0	Low-Carbon Steels, Long Chipping (C < .25%) Ex. A36, 1008, 1010, 1018, 1108, 1117	<125		<530	920	720	590						
	P1	Low-Carbon Steels, Short Chipping, Free Machining (C < .25%) Ex. 10L18, 1200 Series, 1213, 12L14	<125		<530	820	655	490						
	P2	Medium- and High-Carbon Steels (C > .25%) Ex. 1035, 1045, 10L45, 1080, 1137, 1144, 1525, 1572	<220	<25	>530	720	590	480						
	P3	Alloy Steels and Tool Steels (C > .25%) Ex. P20, 1300, 2000, 3000, 4000, 5000, 8000, SAE A, D, H, 0, S, M, T	<330	<35	600-850	655	560	460						
	P4	High-Strength Alloy Steels and Tool Steels (C > .25%) Ex. P20, 1300, 2000, 3000, 4000, 5000, 8000, SAE A, D, H, 0, S, M, T	340-450	35-48	850-1400	590	490	390						
	P5	Ferritic, Martensitic and PH Stainless Steels Ex. 13-8 PH, 15-5 PH, 17-4 PH, 400 and 500 Series	<330	<35	600-900	680	575	470						
	P6	High-Strength Ferritic, Martensitic and PH Stainless Steels Ex. 13-8 PH, 15-5 PH, 17-4 PH, 400 and 500 Series	340-450	35-48	900-1350	525	460	390						

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)								
						GA4230								
						f_z (inch)								
						.004	.008	.012						
M Stainless Steel	M1	Austenitic Stainless Steels Ex. 200 Series, 301, 302, 304, 304L, 309	130-200		<600	590	525	460						
	M2	High-Strength Austenitic Stainless and Cast Stainless Steels Ex. 310, 316, 316L, 321, 347, 384	150-230	<25	600-800	525	390	330						
	M3	Duplex Stainless Steels Ex. 323, 329, F55, 2205	135-275	<30	<800	560	490	425						

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)								
						GA4230								
						f_z (inch)								
						.004	.008	.012						
K Cast Iron	K1	Gray Cast Iron Ex. Class 20, 25, 30, 35, 40, 45, 50, 55, 60, G1800, G3000, G3500, G4000	120-290	<32	125-500	790	655	490						
	K2	Ductile Cast Irons (Nodular Irons) and Compacted Graphite Irons (CGI) Ex. 60-40-18, 65-45-12, 80-55-06, SAE J434: D4018, D4512, D5506	130-260	<28	<600	720	590	460						
	K3	High-Strength Ductile Irons and Austempered Ductile Irons (ADI) Ex. ASTM A536: 100-70-03, 120-90-02, SAE J434: D7003	180-350	<43	>600	655	525	430						

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)								
						GA4230								
						f_z (inch)								
						.004	.008	.012						
		Iron-Based Heat-Resistant Alloys Ex. A286, A608, INCOLOY 800 Series, N-155, Haynes 556, Discaloy	160-260	25-48	500-1200	180	150	115						
		Cobalt-Based Heat-Resistant Alloys Ex. Haynes 25 (L605), Haynes 188, Stellite, MAR-M302, MAR-M509	250-450	25-48	1000-1450	150	110	-						
		Nickel-Based Heat-Resistant Alloys Ex. Astroloy, Hastelloy X, INCONEL 600 and 700 Series, Waspalloy	160-450	<48	600-1700	160	120	-						
		Titanium and Titanium Alloys Ex. Commercially Pure Ti, Ti-5Al-2.5Sn, Ti-6Al-4V, Ti-3Al-8V-6Cr-4Zr-4Mo	300-400	33-48	900-1600	170	130	-						

TENSILE STRENGTH	HARDNESS		
MPa	Brinell HB	Vickers HV	Rockwell HRC
530	156	165	
560	166	175	
595	176	185	
625	185	195	
660	195	205	
690	204	215	
720	214	225	
740	219	230	
755	223	235	
770	228	240	20.3
785	233	245	21.3
800	238	250	22.2
820	242	255	23.1
835	247	260	24.0
850	252	265	24.8
865	257	270	25.6
880	261	275	26.4
900	266	280	27.1
915	271	285	27.8
930	276	290	28.5
950	280	295	29.2
965	285	300	29.8
995	295	310	31.0
1030	304	320	32.2
1060	314	330	33.3
1095	323	340	34.4
1125	333	350	35.5
1155	342	360	36.6
1190	352	370	37.7
1220	361	380	38.8
1255	371	390	39.8
1290	380	400	40.8
1320	390	410	41.8
1350	399	420	42.7
1385	409	430	43.6
1420	418	440	44.5
1455	428	450	45.3

TENSILE STRENGTH	HARDNESS		
MPa	Brinell HB	Vickers HV	Rockwell HRC
1485	437	460	46.1
1520	447	470	46.9
1555	456	480	47.7
1595	466	490	48.4
1630	475	500	49.1
1665	485	510	49.8
1700	494	520	50.5
1740	504	530	51.1
1775	513	540	51.7
1810	523	550	52.3
1845	532	560	53.0
1880	542	570	53.6
1920	551	580	54.1
1955	561	590	54.7
1995	570	600	55.2
2030	580	610	55.7
2070	589	620	56.3
2105	599	630	56.8
2145	608	640	57.3
2180	618	650	57.8
		660	58.3
		670	58.8
		680	59.2
		690	59.7
		700	60.1
		720	61.0
		740	61.8
		760	62.5
		780	63.3
		800	64.0
		820	64.7
		840	65.3
		860	65.9
		880	66.4
		900	67.0
		920	67.5
		940	68.0

Metalcutting Safety

Read before using the tools in this catalog!

Projectile and Fragmentation Hazards:

Modern metalcutting operations involve high spindle and cutter speeds and high temperatures and cutting forces. Hot metal chips may fly off the workpiece during metalcutting. Although cutting tools are designed and manufactured to withstand high cutting forces and temperatures, they can sometimes fragment, particularly if they are subjected to over-stress, severe impact, or other abuse. Many variables affect machining operations. It is impossible to cover every specific situation. The technical information included in this catalog and recommendations on machining practices may not apply to your particular operation. As sold and under normal conditions of use, hardmetal products and tools do not present inhalation, ingestion or other chemical hazards. The health hazards relate only to hardmetal powder. Under normal conditions of use, operations involving hardmetal products and tools do not result in the release of hardmetal powder (either in the form of dusts or fumes) and do not present inhalation, ingestion or other chemical hazards.

To avoid injury:

- Always wear appropriate personal protective equipment, including safety goggles, when operating metalcutting machines or working nearby.
- Always make sure all machine guards are in place.

Breathing and Skin Contact Hazards:

Grinding carbide or other advanced cutting tool materials produces dust or mist containing metallic particles.

To avoid injury:

- If grinding, read the applicable Material Safety Data Sheet and consult General Industry Safety and Health Regulations, Part 1910, Title 29 of the Code of Federal Regulations. These safety instructions are general guidelines.

Although we have attempted to provide current and accurate information herein, we make no representations regarding the accuracy or the completeness of the information and assume no liability for any loss, damage, or injury of any kind which may result from or arise out of the use of or reliance on the information by any person.

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