



TUFFY INDEXABLE INSERTS

CONTENTS

4-52

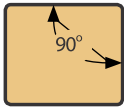
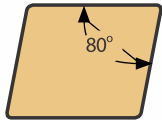
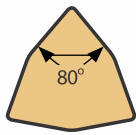
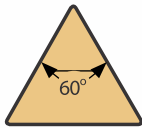
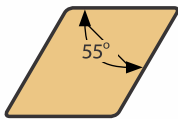
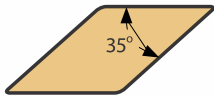
4	Insert Selection Guide
5-8	Code Key - Catalog Numbers-Negative Rake
9	CVD Coating Competitors Comparison Grade Chart
10	Grades for General Turning - Negative Rake Inserts
11-12	Grade Applications
13	Chipbreakers - Negative Rake Inserts
14-32	Turning Inserts - Negative Rake
33	Grades for General Turning - Positive Rake Inserts
34	Chipbreakers - Positive Rake Inserts
35-43	Turning Inserts - Positive Rake
44	Code Key - Catalog Numbers-Positive Rake
45-46	Code Key - ISO Designation
47	Turning Formulas and Nomenclature
48	Surface Roughness
49-50	Recommended Starting Cutting Speeds
51	TroubleShooting
52	CVD Coating Competitors Comparison Grade Chart



INSERT SELECTION GUIDE



SHAPE | APPLICATION CONDITIONS | CONSIDERATIONS

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 tool-holder 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).



INDEXABLE INSERTS

CODE KEY-CATALOG NUMBERS



EXAMPLE 1

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

1		
Insert Shape		
C	80° Diamond	
D	55° Diamond	
S	Square	
T	Triangle	
V	35° Diamond	
W	80° Corner Trigon	

2	
Clearance Angle	
B	5° Positive Rake
C	7° Positive Rake
N	0° Negative Rake
P	11° 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



INDEXABLE INSERTS

CODE KEY-CATALOG NUMBERS



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	



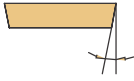
INDEXABLE INSERTS

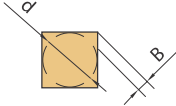
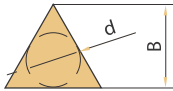
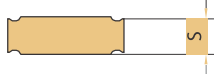
CODE KEY-ISO DESIGNATION



EXAMPLE 1

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

1			2	
Insert Shape			Clearance Angle	
C	80° Diamond			
D	55° Diamond			
S	Square			
T	Triangle		B	5° Positive Rake
V	35° Diamond		C	7° Positive Rake
W	80° Corner Trigon		N	0° Negative Rake
			P	11° 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



INDEXABLE INSERTS

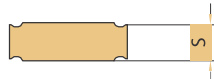
CODE KEY-ISO DESIGNATION



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

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

5						
Insert Size						
Cutting Edge Length, mm						
Symbol						
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		

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	



INDEXABLE INSERTS



CVD COATING COMPETITORS GRADE CHART

CVD COATING COMPETITORS COMPARISON GRADE CHART

TURNING

Material	Code		SANDVIK	TAEGU Tec	WALTER	TUNGALOY	MITSUBISHI	ISCAR	KENAMETAL	SUMITOMO	KYOCERA	DIJET	HITACHI	KORLOY	SECO	ZCC.CT
P	P01		GC4005 GC4205	TT8115	WPP01 WPP05	T9105	UE6105	IC9150 IC8150	KCP05 KCP10	AC810P	CA5505	JC110V	HG8010	NC3010	TP0500 TP1500	
	P10	GP1115	GC4015 GC4215	TT8115 TT8125	WPP01 WPP10 WAK20	T9105 T9115	UE6105 UE6110	IC9150 IC8150 IC428 IC5005	KCP10 TN7005 TN7010	AC810P AC820P	CA5505 CA5515 CA5525	JC110V JC215V	HG8010 GM8020	NC3010 NC3220	TP0500 TP1500 TP2500	YBC152 YBC151
	P20	GP1125 GP1225	GC4015 GC4225 GC4025 GC4215 LC25	TT8125 TT5100	WPP10 WPP20	T9115 T9125 T9015	UE6110 UE6010 UE6020	IC9250 IC8250 IC9150 IC8150	KCP25 TN7015	AC820P AC830P	CA5515 CA5525 CA5025 CR9025	JC110V JC215V	HG8025 GM8020	NC3220 NC3120 NC5330	TP1500 TP2500 TP200 TP2000	YBC251 YBC252
	P30	GP1225 GP1135	GC4225 GC4235 GC4025 GC4035 GC2135	TT8125 TT8135 TT5100 TT7100	WPP20 WPP30	T9125 T9135 T9025	UE6020 UE6035 UH6400	IC8350 IC9350 IC656	KCP30 TN7025	AC820P AC830P	CA5525 CA5535 CR9025	JC215V JC325V	HG8025 GM8020 GM25 GM8035	NC3220 NC3030 NC5330 NC500H	TP2500 TP3500 TP300 TP3000	YBC252 YBC351
	P40	GP1135	GC4235 GC4035 GC235	TT8135 TT7100	WPP30 WAK30	T9135	UE6035 UH6400	IC9350 IC635	KCP40	AC830P	CA5535	JC325V	GM8035 GX30	NC5330 NC500H	TP3500 TP40	YBC351
M	M10		GC2015	TT9215		T9115	MC7015 US7020	IC6015 IC8150	KCM15 TN7010	AC610M	CA6515	JC110V	HG8025		TM2000	
	M20	GM1125	GC2015 GC2025	TT9215 TT9225		T6120 T9125 T6020	MC7015 MC7025 US7020	IC6015 IC6025 IC8250	KCM15 KCM25 TN7015	AC610M AC630M	CA6525 CA6515	JC110V JC605X	HG8025 GM25 GM8035		TM2000 TM4000	YBM151 YBM153
	M30		GC2135 GC235	TT9225 TT9235		T6130 T6030	MC7025 US735	IC6025 IC8350	KCM25 KCM35 TN8025	AC630M AC830P	CA6525	JC525X	GM25 GM8035 GX30	NC9025	TM4000 TP40	YBM151 YBC251
	M40		GC235	TT9235			US735	IC656 IC635	KCM35			JC525X	GX30	NC9025	TM4000 TP40	YBM253
K	K01		GC3205 GC3210	TT7005	WAK10	T5105	UC5105 MC5005	IC5005 IC8150	KCP05 KCP10 KCK05	AC405K ACK410	CA4010 CA4505	JC105V	GX3505	NC6205	TK1001 TH1500 TK1000	YBD052
	K10	GK1115	GC3205 GC3210 GC3015	TT7015 TT7005	WAK10 WPP05	T5105 T5115	UC5105 UC5115 MC5005 MC5015	IC5005 IC5010	KCK15 TN5015	AC415K AC415K ACK410 ACK420	CA4505 CA4515 CA4010 AC4115 CA4120	JC110V	HX3505 HX3515	NC6025 NC6210	TK1001 TK2001 TK2000 TP0500 TP1500	YBD102 YBD151
	K20	GK1115 GK1125	GC3215	TT7015 TT7310	WAK10 WAK20 WPP10	T5115 T5125	UC5115 MC5015	IC5010	KCK20 KCP25	AC415K AC420K	CA4515 CA4115 CA4120	JC215V	HX3515 HG8010 GM8020	NC6210 NC315K	TK2001 TP2500	YBD152 YBD252
	K30	GK1125 GK1125			WAK20 WAK30 WPP20	T5125	MC5015			AK420K AC820P	CA4120		GM8020 HG8025	NC5330	TP3500 TP200	

INDEXABLE INSERTS



INDEXABLE INSERTS

GRADES FOR GENERAL TURNING



WORKPIECE MATERIAL	ANSI	ISO	Coating Type	
			CVD	PVD
P Steel	C8	01	GP1115	
		10		
	C7	20	GP1225	
		30		
	C6	40		
M Stainless Steel	—	01		GM3125
		10	GM1125	
		20		
		30		
K Cast Iron	C4	01	GK1115	
		10		
	C3	20	GK1125	
	C2	30		

↑ wear resistance
↑ toughness
↑ wear resistance
↑ toughness
↑ wear resistance
↑ toughness



INDEXABLE INSERTS

GRADE APPLICATIONS



Grade / Application Area	Description	Microstructure
GP1115 Finishing and Semi-finishing P STEEL	<i>"First Choice"</i> for <u>Finishing</u> 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	<i>"First Choice"</i> for <u>Medium</u> Turning Applications in Steel (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.	
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.	
GM1125 Finishing to Medium Machining M STAINLESS STEEL	<i>"First Choice"</i> 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.	



INDEXABLE INSERTS

GRADE APPLICATIONS



Grade / Application Area	Description	Microstructure
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	<i>"First Choice"</i> for <u>Finishing</u> Applications in Cast Iron (ISO K Materials). Double-Coated MT-CVD Grade, Thick TiCN and Superthick Al ₂ O 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	<i>"First Choice"</i> for <u>Medium</u> Turning Applications in Cast Iron (ISO K Materials). Double-Coated MT-CVD Grade, Superthick TiCN and Thick Al ₂ O 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.	
GN9125 Semi-finishing to Roughing N NON-FERROUS	Uncoated Sub-Micron grade cemented carbide. 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.	



NEGATIVE RAKE INSERTS

CHIPBREAKERS



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		
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		

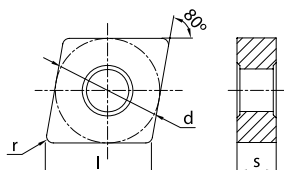


NEGATIVE RAKE INSERTS

TURNING INSERTS



CNMG-QF



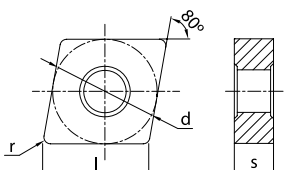
Most popular shape / style of insert. All-purpose turning, facing and boring.

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	GP1115	GP1225		
								EDP#			
CNMG 321-QF	CNMG 090304-QF	3/8	.381	1/8	1/64	.010 - .062	.003 - .010	705488	705152		
CNMG 322-QF	CNMG 090308-QF	3/8	.381	1/8	1/32	.016 - .080	.004 - .014	705492	705154		
CNMG 431-QF	CNMG 120404-QF	1/2	.508	3/16	1/64	.010 - .062	.003 - .010	705358	705157		
CNMG 432-QF	CNMG 120408-QF	1/2	.508	3/16	1/32	.016 - .080	.004 - .014	705456	705161		

Ordering Example: 20 pcs CNMG 432-QF GP1115

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			
								EDP#			
CNMG 432R-SV	CNMG 120408R-SV	1/2	.508	3/16	1/32	.031 - .187	.004 - .018	705500			
CNMG 432L-SV	CNMG 120408L-SV	1/2	.508	3/16	1/32	.031 - .187	.004 - .018	705499			

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.

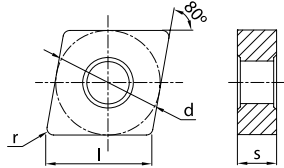


NEGATIVE RAKE INSERTS

TURNING INSERTS



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	GP1115	GP1225		
								EDP#			
CNMG 321-QM	CNMG 090304-QM	3/8	.381	1/8	1/64	.031 - .094	.004 - .016	705489	705490		
CNMG 322-QM	CNMG 090308-QM	3/8	.381	1/8	1/32	.031 - .125	.004 - .016	705493	705494		
CNMG 431-QM	CNMG 120404-QM	1/2	.508	3/16	1/64	.031 - .125	.004 - .016	705495	705496		
CNMG 432-QM	CNMG 120408-QM	1/2	.508	3/16	1/32	.031 - .156	.004 - .016	705457	705458		
CNMG 433-QM	CNMG 120412-QM	1/2	.508	3/16	3/64	.031 - .156	.004 - .016	705504	705505		
CNMG 434-QM	CNMG 120416-QM	1/2	.508	3/16	1/16	.040 - .187	.004 - .016		705506		
CNMG 542-QM	CNMG 160608-QM	5/8	.635	1/4	1/32	.031 - .156	.004 - .016	705508	705509		
CNMG 543-QM	CNMG 160612-QM	5/8	.635	1/4	3/64	.031 - .156	.004 - .016	705511	705512		
CNMG 642-QM	CNMG 190608-QM	3/4	.762	1/4	1/32	.031 - .156	.004 - .016	705515	705516		
CNMG 643-QM	CNMG 190612-QM	3/4	.762	1/4	3/64	.031 - .156	.004 - .016	705518	705519		
CNMG 644-QM	CNMG 190616-QM	3/4	.762	1/4	1/16	.062 - .187	.006 - .018		705521		

Ordering Example: 20 pcs CNMG 644-QM GP1225

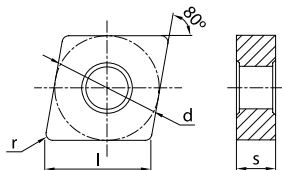


NEGATIVE RAKE INSERTS

TURNING INSERTS



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		
								EDP#			
CNMG 321-SM	CNMG 090304-SM	3/8	.381	1/8	1/64	.016 - .094	.004 - .012	705153	705491		
CNMG 322-SM	CNMG 090308-SM	3/8	.381	1/8	1/32	.031 - .125	.005 - .016	705155	705156		
CNMG 431-SM	CNMG 120404-SM	1/2	.508	3/16	1/64	.016 - .094	.004 - .012	705158	705497		
CNMG 432-SM	CNMG 120408-SM	1/2	.508	3/16	1/32	.031 - .125	.005 - .016	705162	705163		
CNMG 433-SM	CNMG 120412-SM	1/2	.508	3/16	3/64	.031 - .156	.006 - .020	705166	705167		
CNMG 434-SM	CNMG 120416-SM	1/2	.508	3/16	1/16	.047 - .156	.007 - .026	705507	705169		
CNMG 542-SM	CNMG 160608-SM	5/8	.635	1/4	1/32	.031 - .187	.005 - .016	705172	705510		
CNMG 543-SM	CNMG 160612-SM	5/8	.635	1/4	3/64	.031 - .219	.006 - .020	705513	705175		
CNMG 544-SM	CNMG 160616-SM	5/8	.635	1/4	1/16	.062 - .219	.007 - .026	705514	705178		
CNMG 642-SM	CNMG 190608-SM	3/4	.762	1/4	1/32	.031 - .219	.005 - .016	705517	705179		
CNMG 643-SM	CNMG 190612-SM	3/4	.762	1/4	3/64	.031 - .250	.006 - .020	705520	705182		
CNMG 644-SM	CNMG 190616-SM	3/4	.762	1/4	1/16	.062 - .250	.007 - .026	705522	705185		

Ordering Example: 20 pcs CNMG 644-SM GM1125

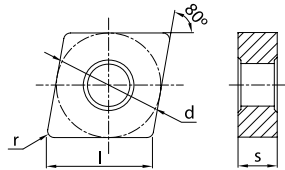


NEGATIVE RAKE INSERTS

TURNING INSERTS

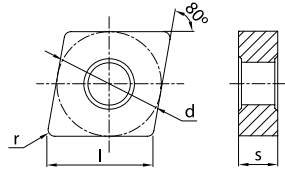


CNMG-UK

						Most popular shape / style of insert. All-purpose turning, facing and boring. <i>UK: Lower cutting force geometry for Cast Iron.</i> <i>Edge geometry reduces cutting forces in moderate conditions / lighter cuts.</i>					
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		
								EDP#			
CNMG 431-UK	CNMG 120404-UK	1/2	.508	3/16	1/64	.020 - .156	.003 - .016	705359	705498		
CNMG 432-UK	CNMG 120408-UK	1/2	.508	3/16	1/32	.031 - .156	.004 - .016	705501	705502		

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		
								EDP#			
CNMG 432-HK	CNMG 120408-HK	1/2	.508	3/16	1/32	.031 - .187	.004 - .016	705362	705160		
CNMG 433-HK	CNMG 120412-HK	1/2	.508	3/16	3/64	.031 - .187	.006 - .020	705503	705165		
CNMG 543-HK	CNMG 160612-HK	5/8	.635	1/4	3/64	.047 - .219	.006 - .020	705370	705174		
CNMG 544-HK	CNMG 160616-HK	5/8	.635	1/4	1/16	.062 - .219	.008 - .026		705177		
CNMG 643-HK	CNMG 190612-HK	3/4	.762	1/4	3/64	.062 - .250	.006 - .020	705372	705181		
CNMG 644-HK	CNMG 190616-HK	3/4	.762	1/4	1/16	.087 - .250	.008 - .026		705184		

Ordering Example: 20 pcs CNMG 644-HK GK1125

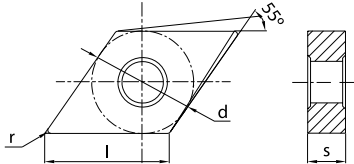


NEGATIVE RAKE INSERTS

TURNING INSERTS

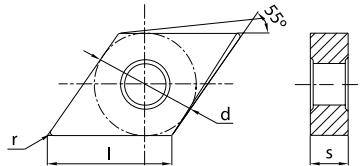


DNMG-QF

			Use for profile turning, copy turning, and semi-finishing. Can turn more complex shapes due to 55° included angle. <i>QF: First Choice Geometry for finishing and semi-finishing applications in all types of Steel.</i>								
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1115	GP1225		
								EPD#			
DNMG 331-QF	DNMG 110404-QF	3/8	.458	3/16	1/64	.010 - .062	.003 - .010	705553	705186		
DNMG 332-QF	DNMG 110408-QF	3/8	.458	3/16	1/32	.016 - .080	.004 - .014	705557	705187		
DNMG 431-QF	DNMG 150404-QF	1/2	.610	3/16	1/64	.010 - .062	.003 - .010	705563	705191		
DNMG 432-QF	DNMG 150408-QF	1/2	.610	3/16	1/32	.016 - .080	.004 - .014	705569	705195		

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. <i>QM: First Choice Geometry for medium to semi-roughing applications in all types of Steel.</i>								
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1115	GP1225		
								EDP#			
DNMG 331-QM	DNMG 110404-QM	3/8	.458	3/16	1/64	.031 - .094	.004 - .016	705554	705555		
DNMG 332-QM	DNMG 110408-QM	3/8	.458	3/16	1/32	.031 - .125	.004 - .016	705558	705559		
DNMG 333-QM	DNMG 110412-QM	3/8	.458	3/16	3/64	.031 - .125	.004 - .016	705560	705561		
DNMG 431-QM	DNMG 150404-QM	1/2	.610	3/16	1/64	.031 - .125	.004 - .016	705564	705565		
DNMG 432-QM	DNMG 150408-QM	1/2	.610	3/16	1/32	.031 - .156	.004 - .016	705570	705571		
DNMG 433-QM	DNMG 150412-QM	1/2	.610	3/16	3/64	.031 - .156	.004 - .016	705575	705576		

Ordering Example: 20 pcs DNMG 433-QM GP1115

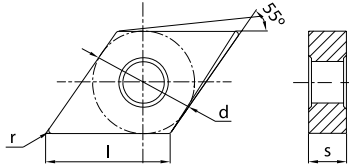


NEGATIVE RAKE INSERTS

TURNING INSERTS



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		
								EDP#			
DNMG 331-SM	DNMG 110404-SM	3/8	.458	3/16	1/64	.016 - .094	.004 - .012	705556			
DNMG 332-SM	DNMG 110408-SM	3/8	.458	3/16	1/32	.031 - .125	.005 - .016	705188	705189		
DNMG 333-SM	DNMG 110412-SM	3/8	.458	3/16	3/64	.031 - .156	.006 - .020	705562	705190		
DNMG 431-SM	DNMG 150404-SM	1/2	.610	3/16	1/64	.016 - .094	.004 - .012	705192	705566		
DNMG 432-SM	DNMG 150408-SM	1/2	.610	3/16	1/32	.031 - .125	.005 - .016	705196	705197		
DNMG 433-SM	DNMG 150412-SM	1/2	.610	3/16	3/64	.031 - .156	.006 - .020	705577	705200		

Ordering Example: 20 pcs DNMG 433-SM GM1125

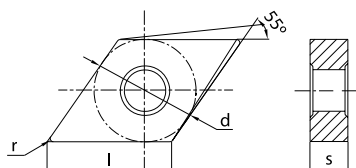


NEGATIVE RAKE INSERTS

TURNING INSERTS



DNMG-UK



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

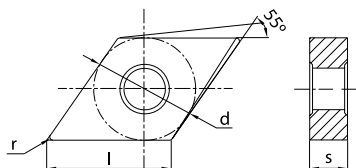
UK: Lower cutting force geometry for Cast Iron.

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		
								EDP#			
DNMG 431-UK	DNMG 150404-UK	1/2	.610	3/16	1/64	.020 - .156	.003 - .016	705567	705568		
DNMG 432-UK	DNMG 150408-UK	1/2	.610	3/16	1/32	.031 - .156	.004 - .016	705572	705573		

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		
								EDP#			
DNMG 432-HK	DNMG 150408-HK	1/2	.610	3/16	1/32	.031 - .187	.004 - .016	705441	705194		
DNMG 433-HK	DNMG 150412-HK	1/2	.610	3/16	3/64	.031 - .187	.006 - .020	705574	705199		

Ordering Example: 20 pcs DNMG 433-HK GK1115

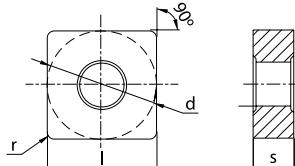


NEGATIVE RAKE INSERTS

TURNING INSERTS

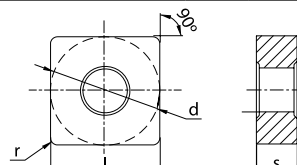


SNMG-QF

						Excellent economy due to 8 cutting edges. Strong insert shape. Mainly for rough facing and chamfering (not turning to a shoulder). <i>QF: First Choice Geometry for finishing and semi-finishing applications in all types of Steel.</i>					
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1115	GP1125		
								EDP#			
SNMG 321-QF	SNMG 090304-QF	3/8	.375	1/8	1/64	.010 - .062	.003 - .010	705585	705586		
SNMG 322-QF	SNMG 090308-QF	3/8	.375	1/8	1/32	.016 - .080	.004 - .014	705590	705591		
SNMG 431-QF	SNMG 120404-QF	1/2	.500	3/16	1/64	.010 - .062	.003 - .010	705594	705595		
SNMG 432-QF	SNMG 120408-QF	1/2	.500	3/16	1/32	.016 - .080	.004 - .014	705600	705601		

Ordering Example: 20 pcs SNMG 432-QF GP1115

SNMG-SV

		Excellent economy due to 8 cutting edges. Strong insert shape. Mainly for rough facing and chamfering (not turning to a shoulder). <i>SV: Sharp Edge Geometry for turning and facing unstable workpieces. Can handle a wide range of depths of cut.</i>											
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					
								EDP#					
SNMG 432R-SV	SNMG 120408R-SV	1/2	.500	3/16	1/32	.031 - .187	.004 - .018	705604					
SNMG 432L-SV	SNMG 120408L-SV	1/2	.500	3/16	1/32	.031 - .187	.004 - .018	705599					

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.

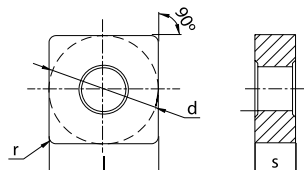


NEGATIVE RAKE INSERTS

TURNING INSERTS



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	GP1115	GP1225		
								EDP#			
SNMG 321-QM	SNMG 090304-QM	3/8	.375	1/8	1/64	.031 - .094	.004 - .016	705587	705588		
SNMG 322-QM	SNMG 090308-QM	3/8	.375	1/8	1/32	.031 - .125	.004 - .016	705592	705593		
SNMG 431-QM	SNMG 120404-QM	1/2	.500	3/16	1/64	.031 - .125	.004 - .016	705596	705597		
SNMG 432-QM	SNMG 120408-QM	1/2	.500	3/16	1/32	.031 - .156	.004 - .016	705602	705603		
SNMG 433-QM	SNMG 120412-QM	1/2	.500	3/16	3/64	.031 - .156	.004 - .016	705606	705607		
SNMG 434-QM	SNMG 120416-QM	1/2	.500	3/16	1/16	.040 - .187	.004 - .018		705609		
SNMG 542-QM	SNMG 150608-QM	5/8	.625	1/4	1/32	.031 - .156	.004 - .016	705611	705612		
SNMG 543-QM	SNMG 150612-QM	5/8	.625	1/4	3/64	.031 - .156	.004 - .016	705616	705617		
SNMG 643-QM	SNMG 190612-QM	3/4	.750	1/4	3/64	.031 - .156	.004 - .016	705624	705625		

Ordering Example: 20 pcs SNMG 643-QM GP1115

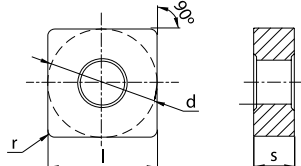


NEGATIVE RAKE INSERTS

TURNING INSERTS



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		
								EDP#			
SNMG 321-SM	SNMG 090304-SM	3/8	.375	1/8	1/64	.016 - .094	.004 - .012	705243	705589		
SNMG 322-SM	SNMG 090308-SM	3/8	.375	1/8	1/32	.031 - .125	.005 - .016	705244	705245		
SNMG 431-SM	SNMG 120404-SM	1/2	.500	3/16	1/64	.016 - .125	.004 - .012	705246	705598		
SNMG 432-SM	SNMG 120408-SM	1/2	.500	3/16	1/32	.031 - .156	.005 - .016	705249	705250		
SNMG 433-SM	SNMG 120412-SM	1/2	.500	3/16	3/64	.031 - .156	.006 - .020	705608	705253		
SNMG 434-SM	SNMG 120416-SM	1/2	.500	3/16	1/16	.047 - .187	.007 - .026	705610	705256		
SNMG 542-SM	SNMG 150608-SM	5/8	.625	1/4	1/32	.031 - .187	.005 - .016	705613	705614		
SNMG 543-SM	SNMG 150612-SM	5/8	.625	1/4	3/64	.031 - .219	.006 - .022	705618	705619		
SNMG 544-SM	SNMG 150616-SM	5/8	.625	1/4	1/16	.047 - .219	.007 - .026	705621	705622		
SNMG 643-SM	SNMG 190612-SM	3/4	.750	1/4	3/64	.031 - .250	.006 - .022	705626	705627		
SNMG 644-SM	SNMG 190616-SM	3/4	.750	1/4	1/16	.047 - .250	.007 - .026	705628	705629		

Ordering Example: 20 pcs SNMG 644-SM GM1125

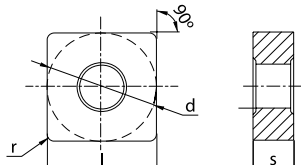


NEGATIVE RAKE INSERTS

TURNING INSERTS



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		
								EDP#			
SNMG 432-HK	SNMG 120408-HK	1/2	.500	3/16	1/32	.031 - .187	.004 - .016	705444	705248		
SNMG 433-HK	SNMG 120412-HK	1/2	.500	3/16	3/64	.031 - .187	.006 - .020	705605	705252		
SNMG 434-HK	SNMG 120416-HK	1/2	.500	3/16	1/16	.062 - .219	.006 - .026		705255		
SNMG 543-HK	SNMG 150612-HK	5/8	.625	1/4	3/64	.047 - .219	.006 - .020	705615	705260		
SNMG 544-HK	SNMG 150616-HK	5/8	.625	1/4	1/16	.062 - .219	.006 - .026		705620		
SNMG 643-HK	SNMG 190612-HK	3/4	.750	1/4	3/64	.062 - .250	.006 - .020	705623	705262		
SNMG 644-HK	SNMG 190616-HK	3/4	.750	1/4	1/16	.087 - .250	.006 - .026		705264		

Ordering Example: 20 pcs SNMG 644-HK GK1125

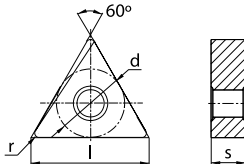


NEGATIVE RAKE INSERTS

TURNING INSERTS

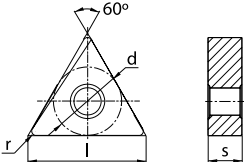


TNMG-QF

						Economical insert, 6 cutting edges. General purpose turning, facing and boring. Extra long cutting edge useful when turning to shoulders <i>QF: First Choice Geometry for finishing and semi-finishing applications in all types of Steel.</i>					
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1115	GP1225		
								EDP#			
TNMG 331-QF	TNMG 160404-QF	3/8	.650	3/16	1/64	.010 - .062	.003 - .010	705655	705301		
TNMG 332-QF	TNMG 160408-QF	3/8	.650	3/16	1/32	.016 - .080	.004 - .014	705663	705303		
TNMG 431-QF	TNMG 220404-QF	1/2	.866	3/16	1/64	.010 - .062	.003 - .010	705674	705307		
TNMG 432-QF	TNMG 220408-QF	1/2	.866	3/16	1/32	.016 - .080	.004 - .014	705676	705310		

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. <i>SV: Sharp Edge Geometry for shaft turning, boring and unstable workpieces. Can handle a wide range of depths of cut.</i>									
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			
								EDP#			
TNMG 331R-SV	TNMG 160404R-SV	3/8	.650	3/16	1/64	.031 - .156	.004 - .016	705658			
TNMG 331L-SV	TNMG 160404L-SV	3/8	.650	3/16	1/64	.031 - .156	.004 - .016	705654			
TNMG 332R-SV	TNMG 160408R-SV	3/8	.650	3/16	1/32	.031 - .187	.004 - .018	705666			
TNMG 332L-SV	TNMG 160408L-SV	3/8	.650	3/16	1/32	.031 - .187	.004 - .018	705662			

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.

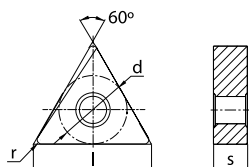


NEGATIVE RAKE INSERTS

TURNING INSERTS



TNMG-QM



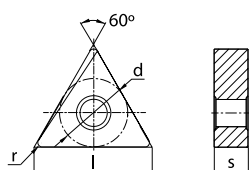
Economical insert, 6 cutting edges. General purpose turning, facing and boring. Extra long cutting edge useful when turning to shoulders.

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	GP1115	GP1225		
								EDP#			
TNMG 221-QM	TNMG 110304-QM	1/4	.433	1/8	1/64	.031 - .094	.004 - .014	705650	705651		
TNMG 222-QM	TNMG 110308-QM	1/4	.433	1/8	1/32	.031 - .094	.004 - .014	705652	705653		
TNMG 331-QM	TNMG 160404-QM	3/8	.650	3/16	1/64	.031 - .094	.004 - .016	705656	705657		
TNMG 332-QM	TNMG 160408-QM	3/8	.650	3/16	1/32	.031 - .125	.004 - .016	705664	705665		
TNMG 333-QM	TNMG 160412-QM	3/8	.650	3/16	3/64	.031 - .156	.004 - .016	705671	705672		
TNMG 432-QM	TNMG 220408-QM	1/2	.866	3/16	1/32	.031 - .156	.004 - .016	705677	705678		
TNMG 433-QM	TNMG 220412-QM	1/2	.866	3/16	3/64	.031 - .156	.004 - .016	705680	705681		
TNMG 434-QM	TNMG 220416-QM	1/2	.866	3/16	1/16	.040 - .187	.004 - .018		705683		

Ordering Example: 20 pcs TNMG 434-QM GP1225

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		
								EDP#			
TNMG 331-SM	TNMG 160404-SM	3/8	.650	3/16	1/64	.016 - .094	.004 - .012	705302	705124		
TNMG 332-SM	TNMG 160408-SM	3/8	.650	3/16	1/32	.031 - .125	.005 - .016	705304	705305		
TNMG 333-SM	TNMG 160412-SM	3/8	.650	3/16	3/64	.031 - .156	.006 - .020	705673	705306		
TNMG 432-SM	TNMG 220408-SM	1/2	.866	3/16	1/32	.031 - .125	.005 - .016	705311	705312		
TNMG 433-SM	TNMG 220412-SM	1/2	.866	3/16	3/64	.031 - .187	.006 - .020	705315	705316		
TNMG 434-SM	TNMG 220416-SM	1/2	.866	3/16	1/16	.047 - .219	.007 - .026	705684	705318		

Ordering Example: 20 pcs TNMG 434-SM GM1125

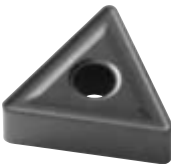
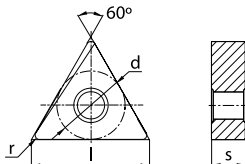


NEGATIVE RAKE INSERTS

TURNING INSERTS

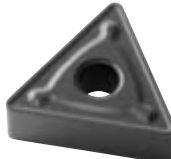
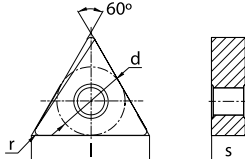


TNMG-UK

		Economical insert, 6 cutting edges. General purpose turning, facing and boring. Extra long cutting edge useful when turning to shoulders. <i>UK: Lower cutting force geometry for Cast Iron.</i> <i>Edge geometry reduces cutting forces in moderate conditions / lighter cuts.</i>									
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		
								EDP#			
TNMG 331-UK	TNMG 160404-UK	3/8	.650	3/16	1/64	.020 - .156	.003 - .016	705659	705660		
TNMG 332-UK	TNMG 160408-UK	3/8	.650	3/16	1/32	.031 - .156	.004 - .016	705667	705668		

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. <i>HK: Exceptionally broad application range geometry primarily for Cast Iron.</i> <i>Strong cutting edge, excellent durability. Semi-finishing to roughing.</i>									
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		
								EDP#			
TNMG 332-HK	TNMG 160408-HK	3/8	.650	3/16	1/32	.031 - .187	.004 - .016	705436	705661		
TNMG 333-HK	TNMG 160412-HK	3/8	.650	3/16	3/64	.031 - .187	.006 - .020	705669	705670		
TNMG 432-HK	TNMG 220408-HK	1/2	.866	3/16	1/32	.031 - .187	.004 - .016	705675	705309		
TNMG 433-HK	TNMG 220412-HK	1/2	.866	3/16	3/64	.031 - .187	.006 - .020	705679	705314		
TNMG 434-HK	TNMG 220416-HK	1/2	.866	3/16	1/16	.062 - .219	.008 - .026		705682		
TNMG 543-HK	TNMG 270612-HK	5/8	1.083	1/4	3/64	.062 - .219	.008 - .020	705685	705686		
TNMG 544-HK	TNMG 270616-HK	5/8	1.083	1/4	1/16	.094 - .219	.008 - .026		705687		

Ordering Example: 20 pcs TNMG 544-HK GK1125

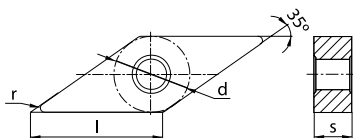


NEGATIVE RAKE INSERTS

TURNING INSERTS



VNMG-QF



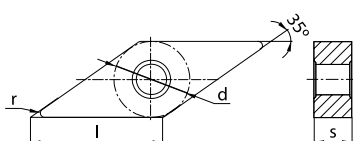
Double-sided 35° diamond. Profiling and copy turning. Not recommended for boring operations due to high negative rake of boring bar pocket.

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	GP1115	GP1225		
								EDP#			
VNMG 331-QF	VNMG 160404-QF	3/8	.654	3/16	1/64	.010 - .062	.003 - .010	7705702	705703		
VNMG 332-QF	VNMG 160408-QF	3/8	.654	3/16	1/32	.016 - .080	.004 - .014	705709	705710		
VNMG 431-QF	VNMG 220404-QF	1/2	.872	3/16	1/64	.010 - .062	.003 - .010	705716	705717		
VNMG 432-QF	VNMG 220408-QF	1/2	.872	3/16	1/32	.016 - .080	.004 - .014	705718	705719		

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	GP1115	GP1225		
								EDP#			
VNMG 331-QM	VNMG 160404-QM	3/8	.654	3/16	1/64	.031 - .094	.004 - .016	705704	705705		
VNMG 332-QM	VNMG 160408-QM	3/8	.654	3/16	1/32	.031 - .125	.004 - .016	705711	705712		
VNMG 333-QM	VNMG 160412-QM	3/8	.654	3/16	3/64	.031 - .156	.004 - .016	705714	705715		

Ordering Example: 20 pcs VNMG 333-QM GP1115

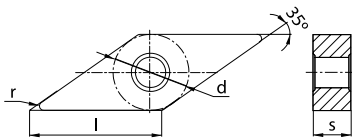


NEGATIVE RAKE INSERTS

TURNING INSERTS

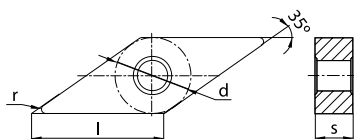


VNMG-SM

						Double-sided 35° diamond. Profiling and copy turning. Not recommended for boring operations due to high negative rake of boring bar pocket. <i>SM: Keen edge geometry especially for Stainless Steel. Unique edgeline reduces work hardening. Semi-finishing to rough machining.</i>					
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		
								EDP#			
VNMG 331-SM	VNMG 160404-SM	3/8	.654	3/16	1/64	.016 - .094	.004 - .012	705327	705706		
VNMG 332-SM	VNMG 160408-SM	3/8	.654	3/16	1/32	.031 - .125	.005 - .016	705328	705329		

Ordering Example: 20 pcs VNMG 332-SM GM1125

VNMG-UK

		Double-sided 35° diamond. Profiling and copy turning. Not recommended for boring operations due to high negative rake of boring bar pocket. <i>UK: Lower cutting force geometry for Cast Iron. Edge geometry reduces cutting forces in moderate conditions / lighter cuts.</i>									
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		
								EDP#			
VNMG 331-UK	VNMG 160404-UK	3/8	.654	3/16	1/64	.020 - .156	.003 - .016	705707	705708		
VNMG 332-UK	VNMG 160408-UK	3/8	.654	3/16	1/32	.031 - .156	.004 - .016	705450	705713		

Ordering Example: 20 pcs VNMG 332-UK GK1115

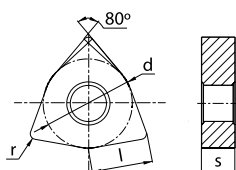


NEGATIVE RAKE INSERTS

TURNING INSERTS



WNMG-QF



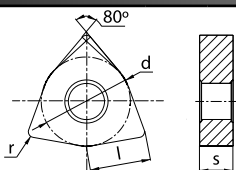
General purpose turning, facing and boring. 80° corner with 6 cutting edges. Maximum economy. Good choice for general turning.

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	GP1115	GP1225		
								EDP#			
WNMG 331-QF	WNMG 060404-QF	3/8	.257	3/16	1/64	.010 - .062	.003 - .010	705724	705330		
WNMG 332-QF	WNMG 060408-QF	3/8	.257	3/16	1/32	.016 - .080	.004 - .014	705728	705332		
WNMG 431-QF	WNMG 080404-QF	1/2	.342	3/16	1/64	.010 - .062	.003 - .010	705459	705336		
WNMG 432-QF	WNMG 080408-QF	1/2	.342	3/16	1/32	.016 - .080	.004 - .014	705735	705340		

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	GP1115	GP1225		
								EDP#			
WNMG 331-QM	WNMG 060404-QM	3/8	.257	3/16	1/64	.031 - .094	.004 - .016	705725	705726		
WNMG 332-QM	WNMG 060408-QM	3/8	.257	3/16	1/32	.031 - .125	.004 - .016	705729	705730		
WNMG 431-QM	WNMG 080404-QM	1/2	.342	3/16	1/64	.031 - .094	.004 - .016	705417	705418		
WNMG 432-QM	WNMG 080408-QM	1/2	.342	3/16	1/32	.031 - .125	.004 - .016	705460	705420		
WNMG 433-QM	WNMG 080412-QM	1/2	.342	3/16	3/64	.031 - .156	.004 - .016	705738	705423		
WNMG 434-QM	WNMG 080416-QM	1/2	.342	3/16	1/16	.040 - .156	.004 - .018		705740		

Ordering Example: 20 pcs WNMG 434-QM GP1225

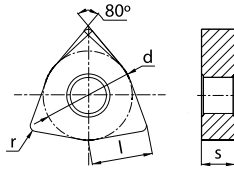


NEGATIVE RAKE INSERTS

TURNING INSERTS



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		
								EDP#			
WNMG 331-SM	WNMG 060404-SM	3/8	.257	3/16	1/64	.016 - .094	.004 - .012	705331	705727		
WNMG 332-SM	WNMG 060408-SM	3/8	.257	3/16	1/32	.031 - .125	.005 - .014	705333	705334		
WNMG 333-SM	WNMG 060412-SM	3/8	.257	3/16	3/64	.031 - .125	.006 - .020	705731	705335		
WNMG 431-SM	WNMG 080404-SM	1/2	.342	3/16	1/64	.016 - .094	.004 - .012	705337	705732		
WNMG 432-SM	WNMG 080408-SM	1/2	.342	3/16	1/32	.031 - .125	.005 - .016	705341	705342		
WNMG 433-SM	WNMG 080412-SM	1/2	.342	3/16	3/64	.031 - .156	.006 - .020	705739	705345		

Ordering Example: 20 pcs WNMG 433-SM GM1125

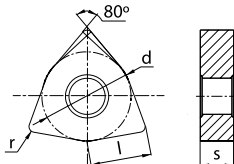


NEGATIVE RAKE INSERTS

TURNING INSERTS

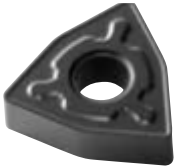
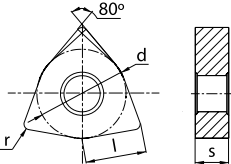


WNMG-UK

		General purpose turning, facing and boring. 80° corner with 6 cutting edges. Maximum economy. Good choice for general turning. <i>UK: Lower cutting force geometry for Cast Iron.</i> <i>Edge geometry reduces cutting forces in moderate conditions / lighter cuts.</i>									
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		
								EDP#			
WNMG 431-UK	WNMG 080404-UK	1/2	.342	3/16	1/64	.020 - .156	.003 - .016	705733	705734		
WNMG 432-UK	WNMG 080408-UK	1/2	.342	3/16	1/32	.031 - .156	.004 - .016	705736	705737		

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. <i>HK: Exceptionally broad application range geometry primarily for Cast Iron. Strong cutting edge, excellent durability. Semi-finishing through to roughing.</i>					
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		
								EDP#			
WNMG 432-HK	WNMG 080408-HK	1/2	.342	3/16	1/32	.031 - .187	.004 - .016	705451	705339		
WNMG 433-HK	WNMG 080412-HK	1/2	.342	3/16	3/64	.031 - .187	.006 - .020	705452	705344		

Ordering Example: 20 pcs WNMG 433-HK GK1115



POSITIVE RAKE INSERTS

GRADES FOR GENERAL TURNING



WORKPIECE MATERIAL	ANSI	ISO	Coating Type		
			CVD	PVD	Uncoated
P Steel	C8	01			
		10			
	C7	20	GP1225	GP3125	
	C6	30			
		40			
M Stainless Steel	-	01		GP3125	
	-	10			
	-	20			
	-	30			
K Cast Iron	C4	01	GK1115	GP3125	
	C3	10			
	C2	20			
	C1	30			
N Non-Ferrous Materials	C4	01			GN9125
	C3	10			
	C2	20			
	C1	30			

↑ wear resistance
↑ toughness
↑ wear resistance
↑ toughness
↑ wear resistance
↑ toughness
↑ wear resistance
↑ toughness

INDEXABLE INSERTS

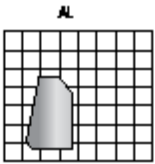
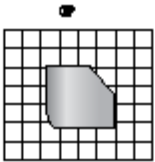
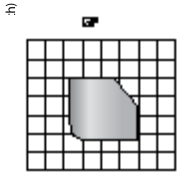


POSITIVE RAKE INSERTS

CHIPBREAKERS



Chipbreaker	Description	Chipbreaker Range	Design



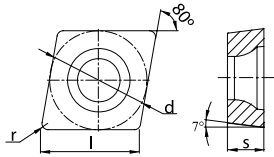


POSITIVE RAKE INSERTS

TURNING INSERTS



CCMT-GP



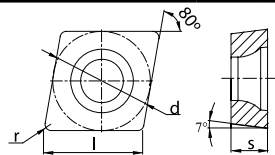
80° diamond inserts for turning and facing or boring and facing. Positive rake, screw-down inserts.

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	
		EDP#									
CCMT 2(1.5)1-GP	CCMT 060204-GP	1/4	.254	3/32	1/64	.020 - .047	.003 - .008	705476		705475	
CCMT 2(1.5)2-GP	CCMT 060208-GP	1/4	.254	3/32	1/32	.031 - .062	.004 - .010	705478		705477	
CCMT 3(2.5)0.5-GP	CCMT 09T302-GP	3/8	.381	5/32	.008	.012 - .039	.003 - .006	705425		705351	
CCMT 3(2.5)1-GP	CCMT 09T304-GP	3/8	.381	5/32	1/64	.020 - .062	.004 - .008	705353		705437	
CCMT 3(2.5)2-GP	CCMT 09T308-GP	3/8	.381	5/32	1/32	.031 - .080	.005 - .010	705484		705427	
CCMT 431-GP	CCMT 120404-GP	1/2	.508	3/16	1/64	.020 - .062	.004 - .008	705355		705485	
CCMT 432-GP	CCMT 120408-GP	1/2	.508	3/16	1/32	.031 - .080	.005 - .010	705357		705428	
CCMT 433-GP	CCMT 120412-GP	1/2	.508	3/16	3/64	.047 - .125	.006 - .012	705487		705486	

Ordering Example: 20 pcs CCMT 433-GP GP1225

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			
		EDP#									
CCGT 2(1.5)1-GP	CCGT 060204-GP	1/4	.254	3/32	1/64	.020 - .047	.003 - .008	705463			
CCGT 2(1.5)2-GP	CCGT 060208-GP	1/4	.254	3/32	1/32	.031 - .062	.004 - .010	705464			
CCGT 3(2.5)0.5-GP	CCGT 09T302-GP	3/8	.381	5/32	.008	.010 - .031	.003 - .006	705465			
CCGT 3(2.5)1-GP	CCGT 09T304-GP	3/8	.381	5/32	1/64	.020 - .062	.004 - .008	705466			
CCGT 3(2.5)2-GP	CCGT 09T308-GP	3/8	.381	5/32	1/32	.031 - .080	.005 - .010	705467			
CCGT 431-GP	CCGT 120404-GP	1/2	.508	3/16	1/64	.020 - .062	.004 - .008	705468			
CCGT 432-GP	CCGT 120408-GP	1/2	.508	3/16	1/32	.031 - .080	.005 - .010	705469			

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.

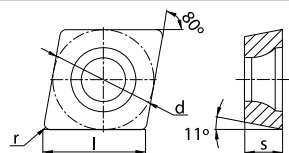


POSITIVE RAKE INSERTS

TURNING INSERTS



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.

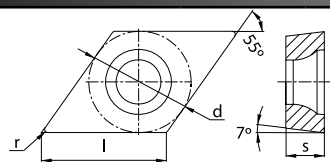
GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

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			
								EDP#			
CPGT 2(1.5)1-GP	CPGT 060204-GP	1/4	.254	3/32	1/64	.020 - .047	.003 - .008	705082			
CPGT 2(1.5)2-GP	CPGT 060208-GP	1/4	.254	3/32	1/32	.031 - .062	.004 - .010	705091			
CPGT 3(2.5)0.5-GP	CPGT 09T302-GP	3/8	.381	5/32	.008	.010 - .031	.003 - .006	705130			
CPGT 3(2.5)1-GP	CPGT 09T304-GP	3/8	.381	5/32	1/64	.020 - .062	.004 - .008	705083			
CPGT 3(2.5)2-GP	CPGT 09T308-GP	3/8	.381	5/32	1/32	.031 - .080	.005 - .010	705094			
CPGT 431-GP	CPGT 120404-GP	1/2	.508	3/16	1/64	.020 - .062	.004 - .008	705096			
CPGT 432-GP	CPGT 120408-GP	1/2	.508	3/16	1/32	.031 - .080	.005 - .010	705099			

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.

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	
								EDP#			
DCMT 2(1.5)1-GP	DCMT 070204-GP	1/4	.305	3/32	1/64	.020 - .047	.003 - .008	705539		705538	
DCMT 2(1.5)2-GP	DCMT 070208-GP	1/4	.305	3/32	1/32	.031 - .062	.004 - .010	705381		705540	
DCMT 3(2.5)0.5-GP	DCMT 11T302-GP	3/8	.458	5/32	.008	.010 - .031	.003 - .006	705382		705542	
DCMT 3(2.5)1-GP	DCMT 11T304-GP	3/8	.458	5/32	1/64	.020 - .062	.004 - .008	705383		705544	
DCMT 3(2.5)2-GP	DCMT 11T308-GP	3/8	.458	5/32	1/32	.031 - .080	.005 - .010	705384		705440	
DCMT 431-GP	DCMT 150404-GP	1/2	.610	3/16	1/64	.020 - .062	.004 - .008	705549		705548	
DCMT 432-GP	DCMT 150408-GP	1/2	.610	3/16	1/32	.031 - .080	.005 - .010	705385		705550	
DCMT 433-GP	DCMT 150412-GP	1/2	.610	3/16	3/64	.047 - .125	.006 - .010	705552		705551	

Ordering Example: 20 pcs DCMT 433-GP GP1225

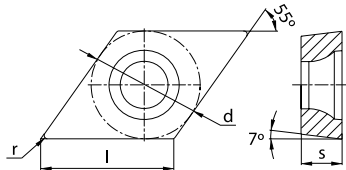


POSITIVE RAKE INSERTS

TURNING INSERTS



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.

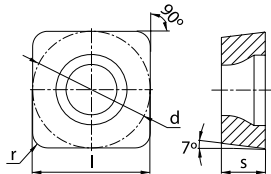
GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

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			
								EDP#			
DCGT 2(1.5)0.5-GP	DCGT 070202-GP	1/4	.305	3/32	.008	.010 - .031	.003 - .006	705528			
DCGT 2(1.5)1-GP	DCGT 070204-GP	1/4	.305	3/32	1/64	.020 - .047	.003 - .008	705374			
DCGT 2(1.5)2-GP	DCGT 070208-GP	1/4	.305	3/32	1/32	.031 - .062	.004 - .010	705530			
DCGT 3(2.5)0.5-GP	DCGT 11T302-GP	3/8	.458	5/32	.008	.010 - .031	.003 - .006	705375			
DCGT 3(2.5)1-GP	DCGT 11T304-GP	3/8	.458	5/32	1/64	.020 - .062	.004 - .008	705532			
DCGT 3(2.5)2-GP	DCGT 11T308-GP	3/8	.458	5/32	1/32	.031 - .080	.005 - .010	705533			

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.

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	
								EDP#			
SCMT 3(2.5)1-GP	SCMT 09T304-GP	3/8	.375	5/32	1/64	.020 - .062	.004 - .008	705393		705580	
SCMT 3(2.5)2-GP	SCMT 09T308-GP	3/8	.375	5/32	1/32	.031 - .080	.005 - .010	705454		705442	
SCMT 431-GP	SCMT 120404-GP	1/2	.500	3/16	1/64	.020 - .062	.004 - .008	705395		705394	
SCMT 432-GP	SCMT 120408-GP	1/2	.500	3/16	1/32	.031 - .080	.006 - .011	705396		705584	

Ordering Example: 20 pcs SCMT 432-GP GP1225

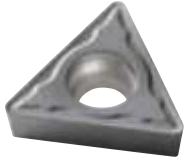
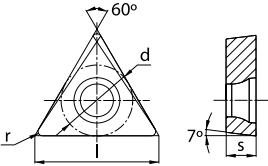


POSITIVE RAKE INSERTS

TURNING INSERTS

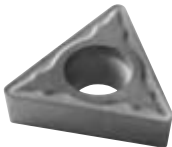
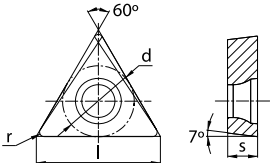


TCMT-GP

			Popular for small diameter boring. Good economy and stable seating of insert. Positive rake screw-down inserts. <i>GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.</i>								
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	
								EDP#			
TCMT 2(1.5)1-GP	TCMT 110204-GP	1/4	.433	3/32	1/64	.020 - .047	.003 - .008	705402		705641	
TCMT 2(1.5)2-GP	TCMT 110208-GP	1/4	.433	3/32	1/32	.031 - .062	.004 - .010	705644		705643	
TCMT 3(2.5)1-GP	TCMT 16T304-GP	3/8	.650	5/32	1/64	.020 - .047	.004 - .008	705646		705446	
TCMT 3(2.5)2-GP	TCMT 16T308-GP	3/8	.650	5/32	1/32	.031 - .080	.005 - .010	705648		705403	
TCMT 432-GP	TCMT 220408-GP	1/2	.866	3/16	1/32	.031 - .094	.006 - .012	705404		705649	

Ordering Example: 20 pcs TCMT 432-GP GP1225

TCGT-GP

						Popular for small diameter boring. Good economy and stable seating of insert. Precision tolerance, positive rake screw-down inserts. <i>GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.</i>					
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			
								EDP#			
TCGT 1.8(1.5)1-GP	TCGT 090204-GP	7/32	.379	3/32	1/64	.020 - .062	.003 - .006	705630			
TCGT 2(1.5)0.5-GP	TCGT 110202-GP	1/4	.433	3/32	.008	.010 - .031	.003 - .006	705631			
TCGT 2(1.5)1-GP	TCGT 110204-GP	1/4	.433	3/32	1/64	.020 - .047	.003 - .008	705632			
TCGT 2(1.5)2-GP	TCGT 110208-GP	1/4	.433	3/32	1/32	.031 - .062	.004 - .010	705633			
TCGT 3(2.5)1-GP	TCGT 16T304-GP	3/8	.650	5/32	1/64	.020 - .047	.004 - .008	705634			
TCGT 3(2.5)2-GP	TCGT 16T308-GP	3/8	.650	5/32	1/32	.031 - .080	.005 - .010	705635			

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

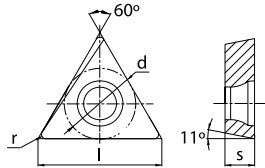
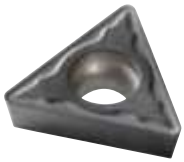


POSITIVE RAKE INSERTS

TURNING INSERTS



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			
								EDP#			
TPGT 2(1.5)1-GP	TPGT 110204-GP	1/4	.433	3/32	1/64	.020 - .047	.003 - .008	705688			
TPGT 2(1.5)2-GP	TPGT 110208-GP	1/4	.433	3/32	1/32	.031 - .062	.004 - .010	705689			
TPGT 3(2.5)1-GP	TPGT 16T304-GP	3/8	.650	5/32	1/64	.020 - .047	.004 - .008	705690			
TPGT 3(2.5)2-GP	TPGT 16T308-GP	3/8	.650	5/32	1/32	.031 - .080	.005 - .010	705691			

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.

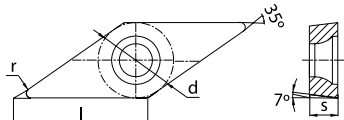


POSITIVE RAKE INSERTS

TURNING INSERTS

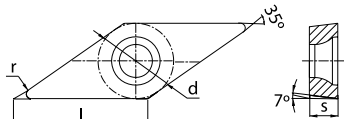


VCMT-GP

						First choice shape for 35° diamond profile turning and boring. Positive cutting action provides for a more secure cutting edge than VNMG style. <i>GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.</i>					
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	
								EDP#			
VCMT 221-GP	VCMT 110304-GP	1/4	.436	1/8	1/64	.020 - .047	.003 - .008	705697		705696	
VCMT 331-GP	VCMT 160404-GP	3/8	.654	3/16	1/64	.020 - .062	.004 - .008	705699		705698	
VCMT 332-GP	VCMT 160408-GP	3/8	.654	3/16	1/32	.031 - .080	.005 - .010	705701		705700	

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. <i>GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.</i>						
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				
								EDP#				
VCGT 221-GP	VCGT 110304-GP	1/4	.436	1/8	1/64	.020 - .047	.003 - .008	705692				
VCGT 331-GP	VCGT 160404-GP	3/8	.654	3/16	1/64	.020 - .062	.004 - .008	705693				
VCGT 332-GP	VCGT 160408-GP	3/8	.654	3/16	1/32	.031 - .080	.005 - .010	705411				

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.

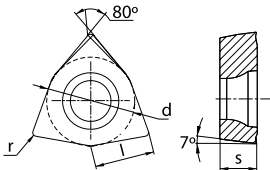


POSITIVE RAKE INSERTS

TURNING INSERTS

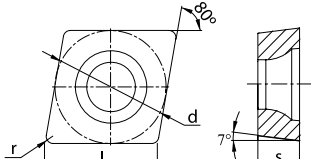


WCMT-GP

			80° corner Trigon inserts for turning, facing and boring. Positive rake screw-down inserts. Extra economy due to 3 cutting edges. <i>GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.</i>								
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	
								EDP#			
WCMT 3(2.5)1-GP	WCMT 06T304-GP	3/8	.257	5/32	1/64	.020 - .062	.003 - .008	705721		705720	
WCMT 3(2.5)2-GP	WCMT 06T308-GP	3/8	.257	5/32	1/32	.031 - .080	.005 - .010	705723		705722	

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

CCGX-AL

		Precision Ground, High Positive, polished 80° diamond inserts for turning, boring and facing of Aluminum, non-ferrous materials and non-metallics. <i>AL: Extremely high 25° positive rake geometry. Super sharp edgeline with polished face for smooth chip flow.</i>									
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	GN9125			
								EDP#			
CCGX 2(1.5)1-AL	CCGX 060204-AL	1/4	.254	3/32	1/64	.016 - .062	.004 - .010	705755			
CCGX 2(1.5)2-AL	CCGX 060208-AL	1/4	.254	3/32	1/32	.020 - .062	.006 - .020	705756			
CCGX 3(2.5)1-AL	CCGX 09T304-AL	3/8	.381	5/32	1/64	.016 - .125	.004 - .010	705757			
CCGX 3(2.5)2-AL	CCGX 09T308-AL	3/8	.381	5/32	1/32	.020 - .125	.006 - .020	705758			
CCGX 431-AL	CCGX 120404-AL	1/2	.508	3/16	1/64	.016 - .187	.004 - .010	705759			
CCGX 432-AL	CCGX 120408-AL	1/2	.508	3/16	1/32	.020 - .187	.006 - .020	705760			

Ordering Example: 20 pcs CCGX 432-AL GN9125

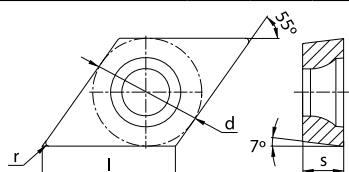


POSITIVE RAKE INSERTS

TURNING INSERTS



DCGX-AL



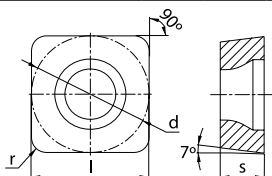
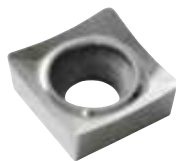
Precision Ground, High Positive, polished 55° diamond inserts for profiling of Aluminum, non-ferrous materials and non-metallics.

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	GN9125			
								EDP#			
DCGX 2(1.5)1-AL	DCGX 070204-AL	1/4	.305	3/32	1/64	.020 - .094	.004 - .010	705761			
DCGX 2(1.5)2-AL	DCGX 070208-AL	1/4	.305	3/32	1/32	.020 - .094	.006 - .020	705762			
DCGX 3(2.5)1-AL	DCGX 11T304-AL	3/8	.458	5/32	1/64	.016 - .094	.004 - .010	705378			
DCGX 3(2.5)2-AL	DCGX 11T308-AL	3/8	.458	5/32	1/32	.020 - .125	.006 - .020	705764			

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

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	GN9125			
								EDP#			
SCGX 3(2.5)1-AL	SCGX 09T304-AL	3/8	.375	5/32	1/64	.016 - .094	.004 - .010	705765			
SCGX 3(2.5)2-AL	SCGX 09T308-AL	3/8	.375	5/32	1/32	.020 - .125	.006 - .020	705766			
SCGX 431-AL	SCGX 120404-AL	1/2	.500	3/16	1/64	.016 - .156	.004 - .010	705767			
SCGX 432-AL	SCGX 120408-AL	1/2	.500	3/16	1/32	.020 - .156	.006 - .020	705768			

Ordering Example: 20 pcs SCGX 432-AL GN9125

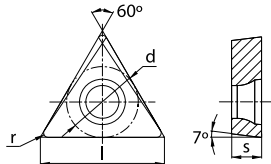
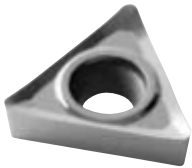


POSITIVE RAKE INSERTS

TURNING INSERTS



TCGX-AL



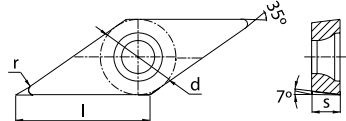
Precision Ground, High Positive, polished triangular inserts for turning and boring of Aluminum, non-ferrous materials and non-metallics.

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	GN9125			
								EDP#			
TCGX 1.8(1.5)1-AL	TCGX 090204-AL	7/32	.379	3/32	1/64	.016 - .094	.004 - .008	705769			
TCGX 2(1.5)1-AL	TCGX 110204-AL	1/4	.433	3/32	1/64	.016 - .094	.004 - .010	705770			
TCGX 2(1.5)2-AL	TCGX 110208-AL	1/4	.433	3/32	1/32	.020 - .125	.006 - .020	705771			
TCGX 3(2.5)1-AL	TCGX 16T304-AL	3/8	.650	5/32	1/64	.016 - .156	.004 - .010	705772			
TCGX 3(2.5)2-AL	TCGX 16T308-AL	3/8	.650	5/32	1/32	.020 - .156	.006 - .020	705773			

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

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	GN9125			
								EDP#			
VCGX 221-AL	VCGX 110304-AL	1/4	.436	1/8	1/64	.016 - .087	.004 - .010	705777			
VCGX 222-AL	VCGX 110308-AL	1/4	.436	1/8	1/32	.020 - .087	.006 - .020	705778			
VCGX 331-AL	VCGX 160404-AL	3/8	.654	3/16	1/64	.016 - .125	.004 - .010	705779			
VCGX 332-AL	VCGX 160408-AL	3/8	.654	3/16	1/32	.020 - .156	.006 - .020	705780			
VCGX 333-AL	VCGX 160412-AL	3/8	.654	3/16	3/64	.020 - .156	.006 - .031	705782			
VCGX 220512-AL	VCGX 220512-AL	1/2	.872	7/32	3/64	.020 - .187	.006 - .031	705774			
VCGX 220516-AL	VCGX 220516-AL	1/2	.872	7/32	1/16	.020 - .187	.006 - .031	705775			
VCGX 220530-AL	VCGX 220530-AL	1/2	.872	7/32	.118	.020 - .187	.010 - .040	705754			

Ordering Example: 20 pcs VCGX 220530-AL GN9125



INDEXABLE INSERTS

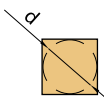
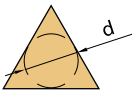
CODE KEY-CATALOG NUMBERS

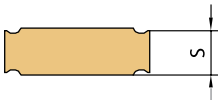


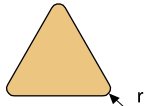
EXAMPLE 2

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	



INDEXABLE INSERTS

CODE KEY- ISO DESIGNATION



EXAMPLE 1

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

1		
Insert Shape		
C	80° Diamond	
D	55° Diamond	
S	Square	
T	Triangle	
V	35° Diamond	
W	80° Corner Trigon	

2	
Clearance Angle	
B	5° Positive Rake
C	7° Positive Rake
N	0° Negative Rake
P	11° 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



INDEXABLE INSERTS

CODE KEY-ISO DESIGNATION



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						
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	



INDEXABLE INSERTS



TURNING FORMULAS AND NOMENCLATURE

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 (in³ / 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



INDEXABLE INSERTS

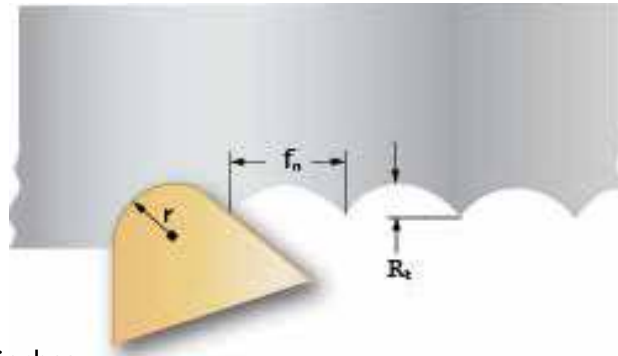
SURFACE ROUGHNESS



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, minches
 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 , minch	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 $R_t = 63$ minches

Insert nose radius $r = 1/32''$

Theoretical starting point for feed $f_n \Rightarrow .004$ 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.



INDEXABLE INSERTS



RECOMMENDED STARTING CUTTING SPEEDS

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)								
						GP1115			GP1225			GP3125		
						f_n (inch/rev)			f_n (inch/rev)			f_n (inch/rev)		
						.004	.008	.012	.004	.008	.016	.004	.008	.012
P Steel	P0	Low-Carbon Steels, Long Chipping (C < .25%) Ex. A36, 1008, 1010, 1018, 1108, 1117	<125		<530	1640	1445	1280	1400	1245	855	655	525	400
	P1	Low-Carbon Steels, Short Chipping, Free Machining (C < .25%) Ex. 10L18, 1200 Series, 1213, 12L14	<125		<530	1400	1245	1050	1180	1015	655	600	475	360
	P2	Medium- and High-Carbon Steels (C > .25%) Ex. 1035, 1045, 10L45, 1080, 1137, 1144, 1525, 1572	<220	<25	>530	1050	985	885	920	855	625	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	<330	<35	600-850	950	790	655	790	720	490	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	340-450	35-48	850-1400	790	655	525	590	525	330	310	245	180
	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	985	820	655	885	720	560	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	340-450	35-48	900-1350	590	490	330	425	360	300	250	190	150

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)								
						GM1125			GM3125			GP3125		
						f_n (inch/rev)			f_n (inch/rev)			f_n (inch/rev)		
						.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	820	690	560	755	600	475	390	310	240
	M2	High-Strength Austenitic Stainless and Cast Stainless Steels Ex. 310, 316, 316L, 321, 347, 384	150-230	<25	600-800	690	590	460	625	490	400	330	260	210
	M3	Duplex Stainless Steels Ex. 323, 329, F55, 2205	135-275	<30	<800	625	460	360	525	400	300	300	210	160



INDEXABLE INSERTS



RECOMMENDED STARTING CUTTING SPEEDS

INDEXABLE INSERTS

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	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
		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	375	330
		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	330	300

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



INDEXABLE INSERTS

TROUBLESHOOTING



WEAR MECHANISM / PROBLEM

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											



INDEXABLE INSERTS



CVD COATING COMPETITORS GRADE CHART

CVD COATING COMPETITORS COMPARISON GRADE CHART

Material	Code		SANDVIK	TAEGU Tec	WALTER	TUNGALOY	MITSUBISHI	ISCAR	KENAMETAL	SUMITOMO	KYOCERA	DIJET	HITACHI	KORLOY	SECO	ZCC.CT
P	P01		GC4005 GC4205	TT8115	WPP01 WPP05	T9105	UE6105	IC9150 IC8150	KCP05 KCP10	AC810P	CA5505	JC110V	HG8010	NC3010	TP0500 TP1500	
	P10	GP1115	GC4015 GC4215	TT8115 TT8125	WPP01 WPP05 WPP10 WAK20	T9105 T9115	UE6105 UE6110	IC9150 IC8150 IC428 IC5005	KCP10 TN7005 TN7010	AC810P AC820P	CA5505 CA5515 CA5525	JC110V JC215V	HG8010 GM8020	NC3010 NC3220	TP0500 TP1500 TP2500	YBC152 YBC151
	P20	GP1125 GP1225	GC4015 GC4225 GC4025 GC4215 LC25	TT8125 TT5100	WPP10 WPP20	T9115 T9125 T9015	UE6110 UE6010 UE6020	IC9250 IC8250 IC9150 IC8150	KCP25 TN7015	AC820P AC830P	CA5515 CA5525 CA5025 CR9025	JC110V JC215V	HG8025 GM8020	NC3220 NC3120 NC5330	TP1500 TP2500 TP200 TP2000	YBC251 YBC252
	P30	GP1225 GP1135	GC4225 GC4235 GC4025 GC4035 GC2135	TT8125 TT8135 TT5100 TT7100	WPP20 WPP30	T9125 T9135 T9025	UE6020 UE6035 UH6400	IC8350 IC9350 IC656	KCP30 TN7025	AC820P AC830P	CA5525 CA5535 CR9025	JC215V JC325V	HG8025 GM8020 GM25 GM8035	NC3220 NC3030 NC5330 NC500H	TP2500 TP3500 TP300 TP3000	YBC252 YBC351
	P40	GP1135	GC4235 GC4035 GC235	TT8135 TT7100	WPP30 WAK30	T9135	UE6035 UH6400	IC9350 IC635	KCP40	AC830P	CA5535	JC325V	GM8035 GX30	NC5330 NC500H	TP3500 TP40	YBC351
M	M10		GC2015	TT9215		T9115	MC7015 US7020	IC6015 IC8150	KCM15 TN7010	AC610M	CA6515	JC110V	HG8025		TM2000	
	M20	GM1125	GC2015 GC2025	TT9215 TT9225		T6120 T9125 T6020	MC7015 MC7025 US7020	IC6015 IC6025 IC8250	KCM15 KCM25 TN7015	AC610M AC630M	CA6525 CA6515	JC110V JC605X	HG8025 GM25 GM8035		TM2000 TM4000	YBM151 YBM153
	M30		GC2135 GC235	TT9225 TT9235		T6130 T6030	MC7025 US735	IC6025 IC8350	KCM25 KCM35 TN8025	AC630M AC830P	CA6525	JC525X	GM25 GM8035 GX30	NC9025	TM4000 TP40	YBM151 YBC251
	M40		GC235	TT9235			US735	IC656 IC635	KCM35			JC525X	GX30	NC9025	TM4000 TP40	YBM253
K	K01		GC3205 GC3210	TT7005	WAK10	T5105	UC5105 MC5005	IC5005 IC8150	KCP05 KCP10 KCK05	AC405K ACK410	CA4010 CA4505	JC105V	GX3505	NC6205	TK1001 TH1500 TK1000	YBD052
	K10	GK1115	GC3205 GC3210 GC3015	TT7015 TT7005	WAK10 WPP05	T5105 T5115	UC5105 UC5115 MC5005 MC5015	IC5005 IC5010	KCK15 TN5015	AC415K AC415K ACK410 ACK420	CA4505 CA4515 CA4010 AC4115 CA4120	JC110V	HX3505 HX3515	NC6025 NC6210	TK1001 TK2001 TK2000 TP0500 TP1500	YBD102 YBD151
	K20	GK1115 GK1125	GC3215	TT7015 TT7310	WAK10 WAK20 WPP10	T5115 T5125	UC5115 MC5015	IC5010	KCK20 KCP25	AC415K AC420K	CA4515 CA4115 CA4120	JC215V	HX3515 HG8010 GM8020	NC6210 NC315K	TK2001 TP2500	YBD152 YBD252
	K30	GK1125			WAK20 WAK30 WPP20	T5125	MC5015			AK420K AC820P	CA4120		GM8020 HG8025	NC5330	TP3500 TP200	

INDEXABLE INSERTS

TURNING