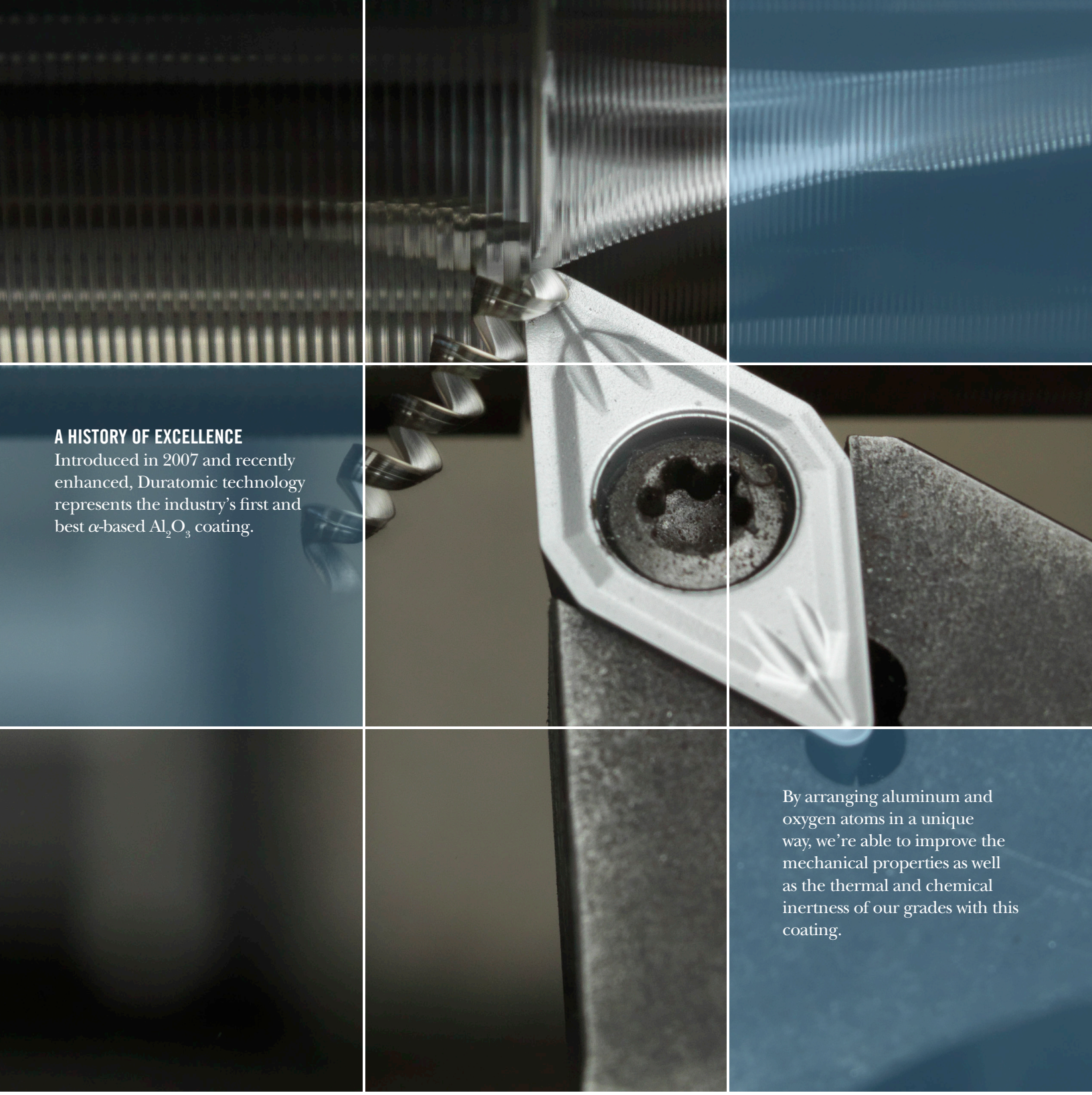
SECO DURATOMIC® TURNING FOR STEEL

REVOLUTIONARY PERFORMANCE IN STEEL TURNING

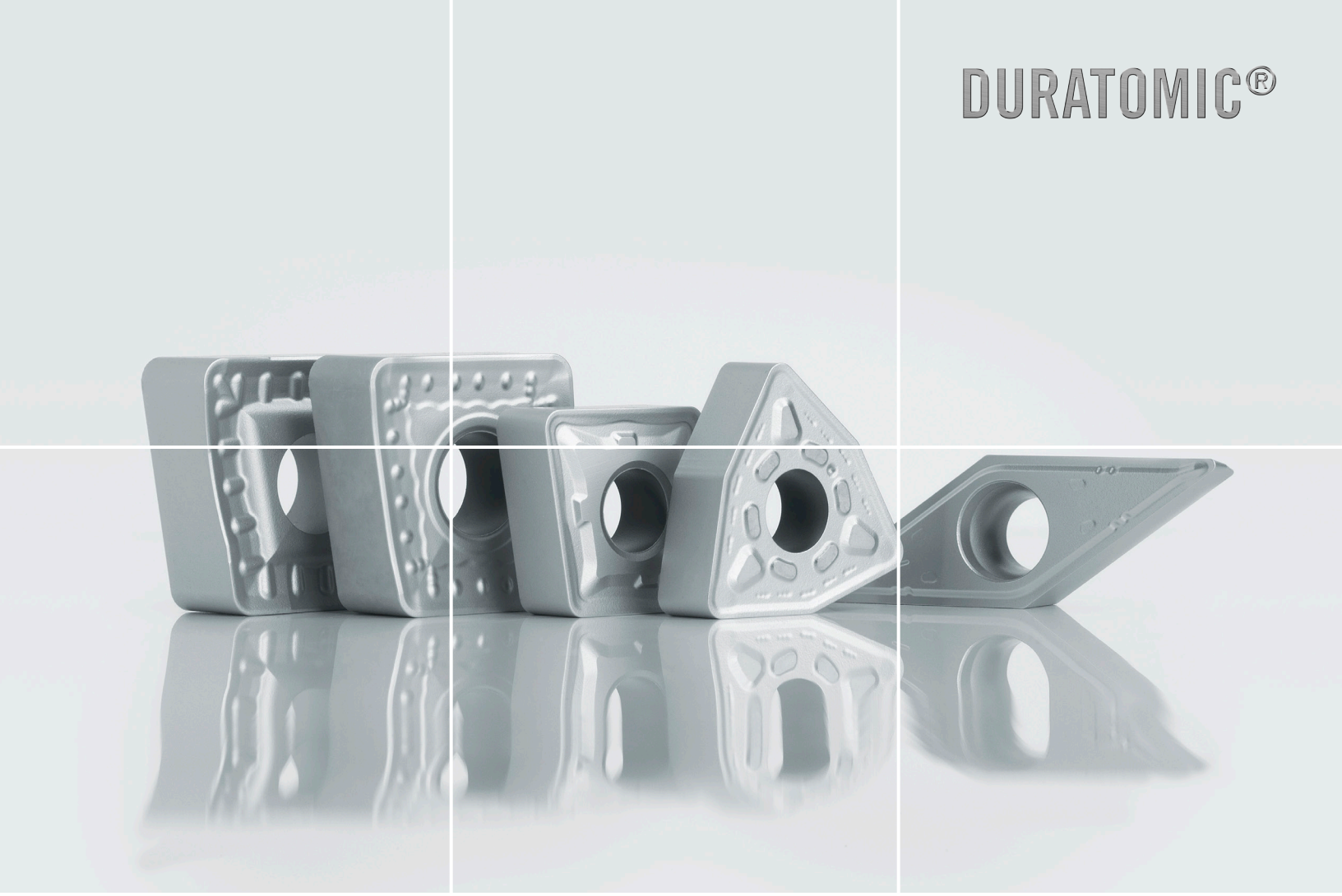


A HISTORY OF EXCELLENCE
Introduced in 2007 and recently enhanced, Duratomic technology represents the industry's first and best α-based Al_2O_3 coating.

By arranging aluminum and oxygen atoms in a unique way, we're able to improve the mechanical properties as well as the thermal and chemical inertness of our grades with this coating.

CHROME IS THE NEW BLACK

DURATOMIC®



THREE GRADES TO COVER ALL YOUR STEEL-TURNING NEEDS

USED EDGE DETECTION
A unique new approach to used edge detection makes it very easy to identify wear with the naked eye, with the key feature being the fact that there is absolutely no impact on overall performance. The used edge detection was selected to give the highest possible contrast and excel in real-life working conditions in all new grades TP2501, TP1501 and TP0501.

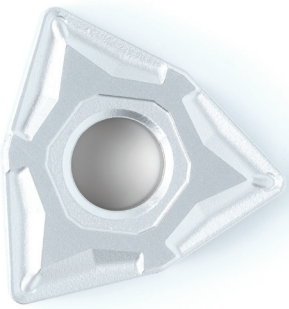
Steel turning is among the most common of all machining operations, yet manufacturers still face production challenges such as insert wear and cutting interruptions. And while insert wear is inevitable, there are choices you can make to limit and control it.

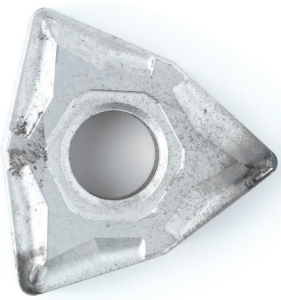
Those choices are the TP2501, TP1501 and TP0501 insert grades that we have maximized for reliable, predictable and productive performance. With these three grades, we cover all your needs for steel turning applications. Such optimization involves taking our extensive research and applying it to the further advancement of our unequalled Duratomic coating technology.

As a result, you get insert grades that feature improved toughness, heat and wear resistance as well as chemical inertness for longer tool life, even at high cutting speeds. With this extended tool life, you can eliminate sudden breakage and lessen rework and scrap.

Available in a broad range of insert shapes and geometries for light, medium and roughing operations, TP2501, TP1501 and TP0501 insert grades provide the best selection in steel turning, whether your goal is versatile, balanced or high-speed productivity.

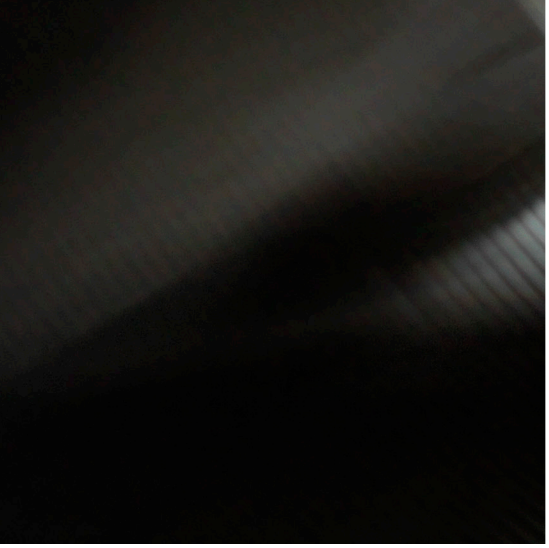
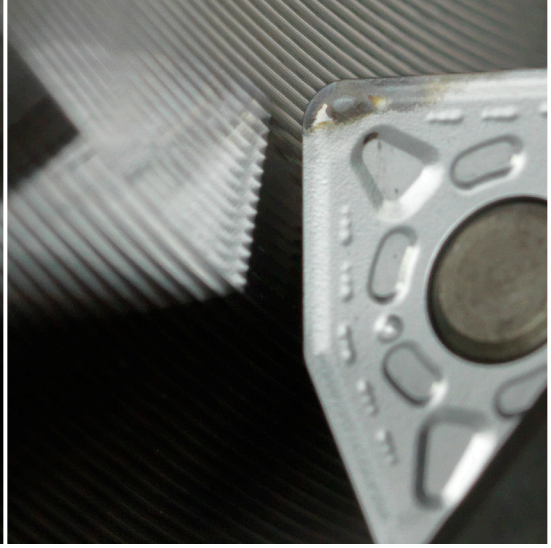
Seco Edge Intelligence: Our integrated value in a single insert





NEVER WASTE ANOTHER INSERT

Our surveys show that 15% of the edges on discarded inserts are unused. Solve this problem with our new Duratomic inserts, which make it nearly impossible to miss which edges have been used. Now you can process more parts per edge, limit production interruptions and reduce waste, all thanks to a revolutionary chrome coating that has no negative impacts on performance or cutting data. Incorporate our new Duratomic inserts with Edge Intelligence and experience the benefits of our integrated value in a single insert.


TP2501:

VERSATILE PRODUCTIVITY

Designed for manufacturers focused on fast, reliable part production, TP2501 with Duratomic technology is the top choice for roughing and finishing operations involving a variety of workpiece material requirements and unpredictable working conditions. In fact, an estimated 25% of steel turning applications operate within parameters that demand the grade's properties, including those in ISO P25.

THE SECO ADVANTAGE

- Multi-capable grade for general steel turning applications, including cutting ferritic/martensitic stainless steels
- Used edge detection for improved economy and reduced waste
- Superior wear resistance for longer tool life, fewer tool changes and higher cutting data
- Highly secure edge toughness behavior for versatility and productivity
- Hinders crater wear, plastic deformation, chip hammering and more over long periods of time

TP1501:

BALANCED PRODUCTIVITY

Primarily applicable to workpieces made from softer, low-alloy steels, the TP1501 with Duratomic technology, with its well-balanced properties, is the top choice for operations requiring high wear resistance and elevated cutting speeds. In fact, an estimated 20% of steel turning applications operate within the parameters that demand the grade's properties.

THE SECO ADVANTAGE

- General grade that balances speed and productivity, primarily in low-alloy steel workpieces
- Used edge detection for improved economy and reduced waste
- Superior wear resistance for longer tool life, fewer tool changes and higher cutting data
- High reliability and accuracy ensures equal quality on all parts produced
- Hinders crater wear, flank wear, edge chipping and more over long periods of time

TP0501:

HIGH-SPEED PRODUCTIVITY

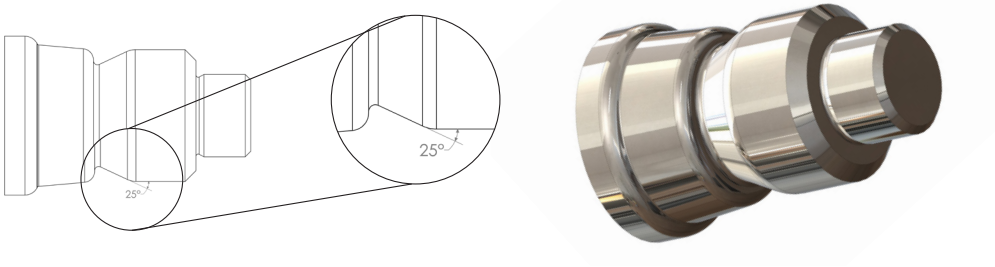
Best suited for highly stable conditions and situations requiring minimal edge toughness, TP0501 with Duratomic technology is the top choice for achieving the highest possible wear resistance and/or cutting speeds in high-alloy and abrasive steel turning applications.

THE SECO ADVANTAGE

- General grade offers high speed and productivity, especially in high-alloy steel workpieces
- Used edge detection for improved economy and reduced waste
- Superior wear resistance for longer tool life, fewer tool changes and higher cutting data
- Extreme heat resistance offers high metal removal without the need for coolant
- Hinders crater wear, plastic deformation, edge chipping and more over long periods of time

TOOL SELECTION MADE EASY:
THE RECOMMENDED PROCESS FOR SELECTING THE RIGHT TOOL

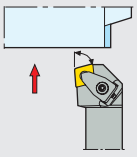
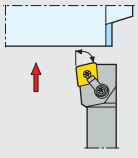
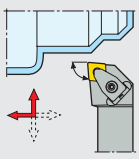
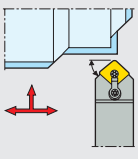
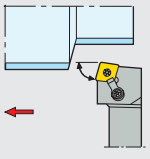
As an illustration of the tool selection process, consider a part that is made of 4140 steel. There is a feature showing an undercut at 25° and the finish requirement is 128 R_a. **APPLICATION EXAMPLE:**

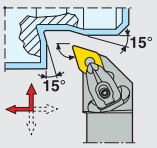
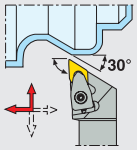
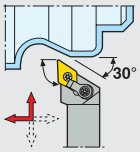
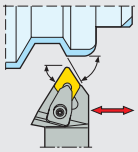


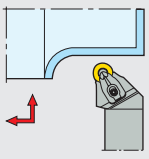
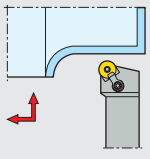
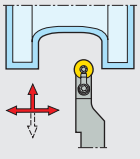
STEP 1: TOOL STYLE

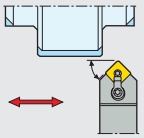
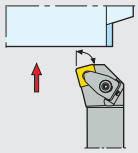
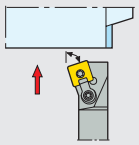
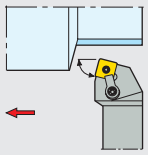
Match the shape of the part to be machined with the sketches shown below. Select toolholder and insert style to suit the machining operation to be carried out.

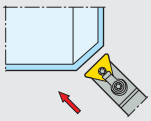
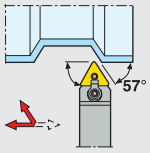
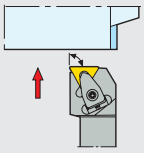
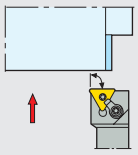
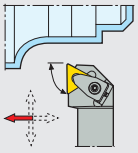
EXTERNAL TURNING, -D STYLE, ANSI -M STYLE AND -P STYLE (M STYLE WITHOUT TOP CLAMP)

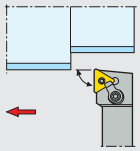
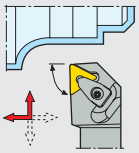
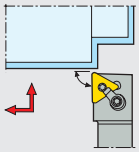
Insert CN...	75°	75°	95°	95°	40°	75°
						
	DCKNR DCKNL	MCKNR MCKNL	DCLNR DCLNL	MCLNR MCLNL	MCMNN	MCRNR MCRNL

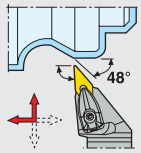
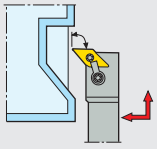
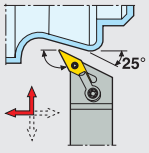
Insert DN...	93°	93°	93°	62.5°
				
	DDHNR DDHNL	DDJNR DDJNL	MDJNR MDJNL	DDPNN

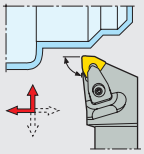
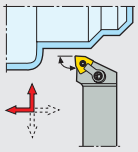
Insert R...			
			
	DRGNR DRGNL	MRGNR MRGNL	MRGOR MRGOL

Insert SN...	45°	75°	75°	75°	45°
					
	MSDNN	DSKNR DSKNL	MSKNR MSKNL	MSRNR MSRNL	MSSNR MSSNL L

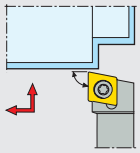
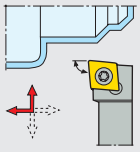
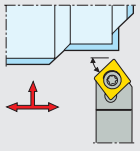
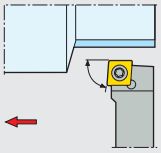
Insert TN...	90°	60°	90°	90°	90°
					
	MTCNN	MTENNS	DTFNR DTFNL	MTFNR MTFNL	DTGNR DTGNL

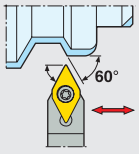
Insert TN...	90°	93°	93°	95°
				
	MTGNR MTGNL	DTJNR DTJNL	MTJNRS MTJNLS	MTLNR MTLNL

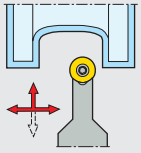
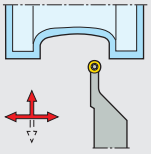
Insert VN...	93°	93°	95°	117.5°	117.5°
					
	DVJNR DVJNL	MVJNR MVJNL	MVLNR MVLNL	DVTNR DVTNL	MVTNR MVTNL

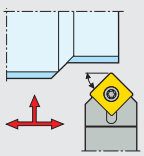
Insert WN...	95°	95°
		
	DWLNR DWLNL	MWLNR MWLNL

EXTERNAL TURNING, ANSI -S C-LOCK (S TOOLHOLDER)

Insert CC...	90°	95°	50°	75°
				
	SCGCR SCGCL	SCLCR SCLCL	SCMCN	SCRCR SCRCL

Insert DC...	93°	62.5°
		
	SDJCR SDJCL	SDPCN

Insert RC...		
		
	SRDCN	SRGCR SRGCL

Insert SC...	45°
	
	SSDCN

Insert TC...	90°
	
	STGCR STGCL

Insert VB...	95°	72.5°
	SVLBR SVLBL	SVVBN

STEP 2: WORKPIECE MATERIAL (STEEL)

Find the name of the material being machined and identify the Seco Material Group that is appropriate for your material of interest, in this case Steel is the material of choice.

Steels, ferritic and martensitic stainless steels

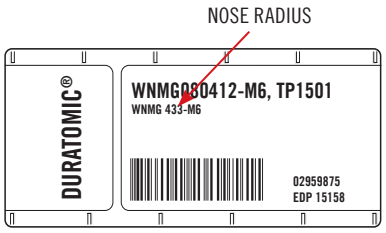
SMG	DESCRIPTION	PROPERTIES UTS = Ultimate tensile strength (ksi)	REFERENCE MATERIAL (ANSI)
P1	Free-cutting steels	50 < UTS < 75	1213 UTS = 55 ksi
P2	Low alloy ferritic steels, C < 0.25%wt Low alloy weldable general structural steels	45 < UTS < 85	A 573 Gr. 58 UTS = 60 ksi
P3	Ferritic & ferritic/pearlitic steels, C < 0.25%wt Weldable general structural steels Case hardening steels	60 < UTS < 90	5115 UTS = 80 ksi
P4	Low alloy general structural steels, 0.25% < C < 0.67%wt Low alloy Quench & Temper steels	75 < UTS < 175	1045 UTS = 95 ksi
P5	Structural steels, 0.25% < C < 0.67%wt Quench & Temper steels	80 < UTS < 175	4140 UTS = 100 ksi
P6	Low alloy through hardening steels, C > 0.67%wt Low alloy spring and bearing steels	75 < UTS < 170	1095 UTS = 85 ksi
P7	Through hardening steels, C > 0.67%wt Spring and bearing steels	85 < UTS < 170	52100 UTS = 95 ksi
P8	Tool steels High Speed Steels (HSS)	85 < UTS < 170	H13 UTS = 100 ksi
P11	Ferritic & martensitic stainless steels	60 < UTS < 170	420 UTS = 95 ksi

STEP 3: NOSE RADIUS & FEED RATE

NOSE RADIUS

The choice of nose radius is dependent on the workpiece design and the machining operation. The nose radius influences cutting data choice and the surface finish achieved. The maximum feed rate that can be used depends on a number of factors including machine power, stability, workpiece material, insert shape and size, nose radius, chipbreaker, grade and setting angle.

Small nose radius = universal machining, low cutting forces (less vibration risk).
Large nose radius = strong, suitable for high cutting data, good surface finish.



Surface finish Ra value (μ inch)	Nose radius, r_ε (inch)					
	.008	.016	.032	.047	.062	.094
	Feed rate, f (inch/rev)					
24	.002	.003	.004	.005	.006	.007
64	.003	.005	.006	.008	.009	.011
128	.005	.006	.009	.011	.013	.016
250	–	.009	.013	.016	.018	.022
320	–	–	.016	.019	.022	.027

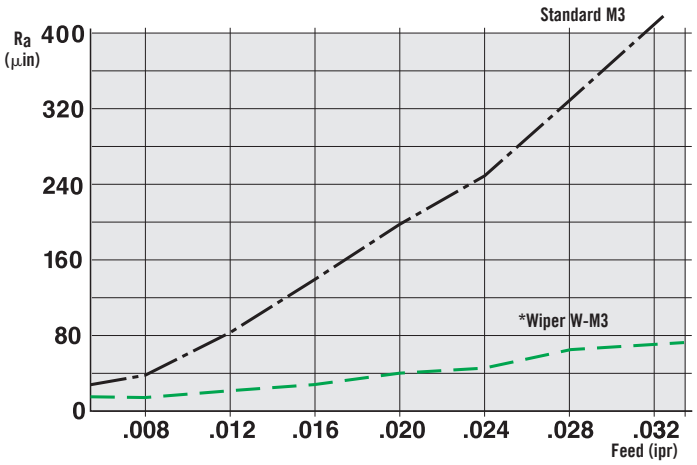
Find the feed recommendations for a chosen chipbreaker. Then look in the surface finish table below to be sure that the required surface finish can be achieved. The maximum feed rate should always be considerably smaller than the nose radius. A feed rate that is too low can result in poor chipbreaking and tool life.

HIGH FEED INSERTS

The Seco High Feed inserts offer
- Excellent surface finish at high feed rates
- Superior surface finish at normal feed rates

The use of High Feed inserts often eliminates the need for finish grinding. High Feed inserts are designed for small cutting depths.

CNMG 432W-M3, TP200, κ_r = 95°, ap = .040", cutting speed adjusted for feed, workpiece material: steel, Seco material group 4.

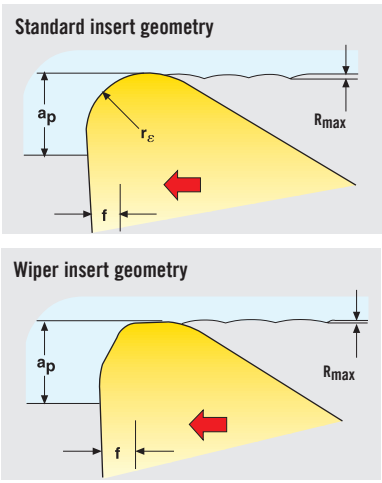


WIPER INSERT OPERATION GUIDELINES

Favorable surface finish results are lost, if the cutting edge angle diverges from:
95° (C & W style inserts)
93° (D & T style inserts)

Maximum diversion angle allowed =/- 2°, Back turning is not reccommended

For more info, see page 59 of the Turning Navigator Catalog.



STEP 4: CHIPGROOVES

Select the proper chip groove by understanding both feed rate and depth of cut, in which you will be machining for your component.

CHIPBREAKER OVERVIEW

The chipbreakers are designed to control the chips when turning long chipping materials. The numerical designations describe the application area as follows:

Numerals 1 through 9:

1 = For low feed rates and easy conditions

9 = For high feed rates and rough conditions

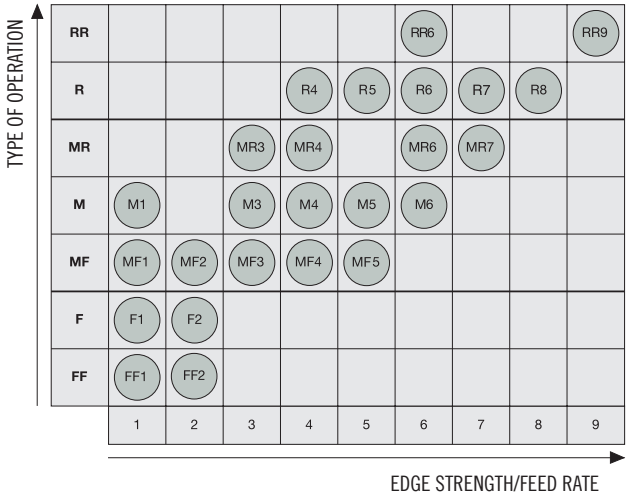
NEGATIVE INSERT CHIPGROOVE RECOMMENDATIONS

Steel (ISO-P)	FF2	M3	M6
Stainless Steel (ISO-M)	MF1	MF4	M5
Cast Iron (ISO-K)	M3	M5	MR7
Hardened Steels (ISO-H)	MF1	M3	–

FINISHING
at low depth of cut. Typical a_p = .008–.032" and f = .008 in/rev.

MEDIUM-ROUGH MACHINING
Typical one pass machining at a_p = .032–.120" and f = .012 in/rev.

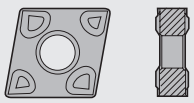
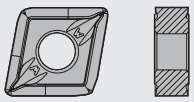
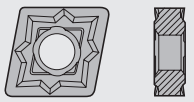
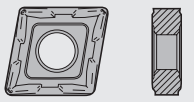
ROUGH MACHINING
at higher depth of cut and feed rate In most cases with difficult surface conditions such as scale, irregularities and other conditions leading to interruptions and edge damage. Typically a_p = .12–.28" and f = .02 in/rev.



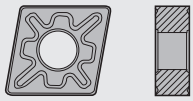
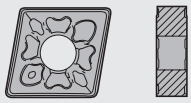
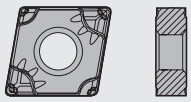
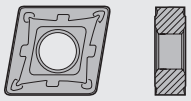
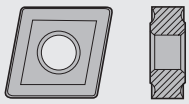
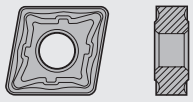
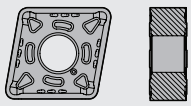
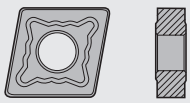
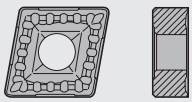
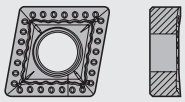
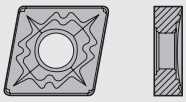
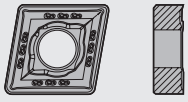
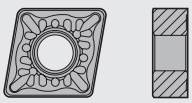
POSITIVE INSERT CHIPGROOVE RECOMMENDATIONS

F1	MF2	M5
F1	MF2	M5
F1	M3	M5
F1	–	–

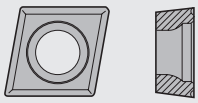
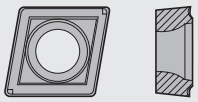
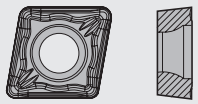
NEGATIVE INSERT CHIPBREAKERS

	-FF1	Chipbreaker for negative inserts. Used to achieve a very fine finish when turning steel and stainless steel. Machining range: f = .003–.012 ipr, a_p = .008–.120"
	-FF2	Chipbreaker for high feed finishing and medium-roughing machining of steel and cast iron. Ensures safe and well directed chip flow and good surface finish. Machining range: f = .008–0.026 ipr, a_p = .020–.157"
	-MF1	Chipbreaker intended for machining stainless steel, superalloys and titanium alloys. Type ..GG insert has a sharp, precision ground edge. Type ..MG insert has a lightly honed cutting edge for increased strength. MF1 is intended for use in semi-finishing and finishing applications. Machining range: f = .003–.012 ipr, a_p = .008–.140"
	-MF2	First choice for finishing with negative inserts. Suitable for chip control at depths of cut down to .010", provided that the feed rate is in excess of .010"/rev. Good capacity for medium-rough machining. Machining range: f = .004–.016 ipr, a_p = .008–.120"

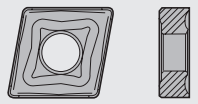
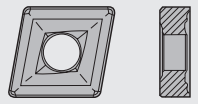
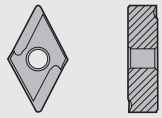
NEGATIVE INSERT CHIPBREAKERS

	-MF3	Chipbreaker with positive cutting rake angle intended for moderately difficult stainless steel. The MF3 is also intended for light roughing in relatively soft, “tacky” steel and difficult to machine stainless steel if the depth of cut is limited. MF3 can also be used for finishing of cast iron. Machining range: f = .006–.016 ipr, a_p = .040–.200”
	-MF4	Chipbreaker intended for medium/finishing of stainless steel, very open and highly positive geometry. Machining range: f = .006–.020 ipr, a_p = .020–.160”
	-MF5	Chipbreaker intended for medium finishing of steel and stainless steel at high feeds. Very easy cutting and open geometry. Machining range: f = .008–.031 ipr, a_p = .008–.100”
	-M3	First choice for medium-rough machining and also the most versatile Seco chipbreaker. In most cases, it is the only chipbreaker needed. Offers the best useful life and best chipbreaking in a wide range of cutting data and workpiece materials. Suitable for precision forged and cast workpieces (Near Net Shape workpieces or NNS) as regards both chip control and edge strength. Machining range: f = .006–.020 ipr, a_p = .020–.200”
	-M4	Chipbreaker intended for cast iron. Positive rake angle with a narrow T-land gives low cutting forces.First choice for cast iron machining at high speeds.Machining range: f = .004–.028 ipr, a_p = .008–.276”
	-M5	First choice for roughing by means of double-sided inserts. Intended for demanding operations at high feed rates in steel, stainless steel and cast iron. Combines high edge strength with comparatively low cut-ting forces. Machining range: f = .010–.028 ipr, a_p = .060–.275”
	-M6	Strong double-sided chipbreaker, intended for semi-roughing and roughing of steel. A well-balanced design combining excellent chip control and relatively low cutting forces which provides reliable cutting action in both continuous as well as interrupted cuts. Well suited also for machining of ferritic and martensitic stainless steels. Machining range: f = 0.008-0.031 in/rev, ap = 0.040-0.275 inch
	-MR4	The MR4 has a negative T-land, which gives extremely high edge strength. The chipbreaker is intended for more difficult machining applications on superalloys and titanium alloys, such as intermittent cuts and the machining of parts with raw surface. Machining range: f = .006–.022 ipr, a_p = .060–.275”
	-MR7	The strongest chipbreaker for double-sided inserts. The MR7 is suitable for high feed rates and depths of cut that normally require a single-sided insert. The chipbreaker has a wide negative T-land, which gives high edge strength. Machining range: f = .010–.032 ipr, a_p = .060–.275”
	-R4	Chipbreaker for single-sided inserts. It has a positive cutting edge which gives low cutting forces. Machining range: f = .008–.024, a_p = .080–.400”
	-R5	Chipbreaker for single-sided inserts. Recommended for medium-roughing of steel. Machining range: f = .012–.040 ipr, a_p = .080–.480”
	-R6	Chipbreaker for single-sided inserts. Recommended for medium-roughing of stainless steel. Machining range: f = .010–.025 ipr, a_p = .080–.400”
	-RR6	A very easy-cutting chipbreaker for single-sided inserts. Recommended for roughing of stainless steel and steel. Machining range: f = .012–.040, a_p = .080–.480”
	-R7	A strong but easy-cutting chipbreaker for single sided inserts. The R7 is well suited for intermittent machining of both stainless and ordinary carbon steel. Machining range: f = .016–.040, a_p = .070–.500”

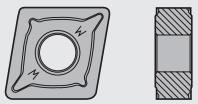
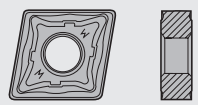
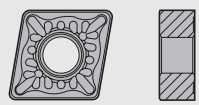
POSITIVE INSERT CHIPBREAKERS

	-FF1	Chipbreaker for positive inserts. Used to achieve a very fine finish when turning steel and stainless steel. Machining range: f = .002–.012 ipr, a_p = .008–.080”
	-F1	A versatile chipbreaker for positive inserts. Positive geometry with sharp cutting edge gives easy-cutting properties. Suitable for high feed rates at fine depths of cut on precision forgings and castings. Machining range: f = .004–.012, a_p = .020–.100” Machining in bar automatics, for instance: f = .003–.010 ipr, a_p = .040–.120”
	-F2/M3	Chipbreaker for positive inserts. Ensures safe chip flow on finishing and medium roughing in steel and stainless steel. Machining range: f = .006–.016 ipr, a_p = .030–.200”
	-M5	Rigid chipbreaker for positive inserts. Intended for medium-rough and rough machining of steels, stainless steels and cast iron. Combines high edge strength with comparatively low cutting forces. Safe action in interruptions and rough skin on parts. Machining range: f = .006–.024 ipr, a_p = .039–.200”

SUPPLEMENTARY CHIPBREAKER PROGRAM

	-R8	A very strong chipbreaker for single-sided inserts. The R8 is intended for high feed rates when machining castings and forgings of austenitic stainless steel. Machining range: f = .014–.031 ipr, a_p = .070–.500”
	-RR9	Extremely strong chipbreaker for single-sided negative inserts, for use at high feed rates. Suitable for difficult castings and forgings and for austenitic stainless steel. Machining range: f = .020–.048 ipr, a_p = .100–.600”
	-UX	Chipbreaker for negative inserts. Positive cutting rake with sharp edge. Low cutting force. Suitable for slim components. Machining range: f = .008–.016 ipr, a_p = .040–.240”

CHIPBREAKER PROGRAM, HIGH FEED INSERTS (WITH WIPER RADIUS)

	W-F1	A versatile chipbreaker for positive inserts. For finishing machining of steel, stainless steel and cast iron giving good surface finish. Suitable for high feed rates at small depth of cut. Machining range: f = .002–.020, a_p = .010–.120”
	W-MF2	First choice for finishing with negative inserts. Chipbreaker suitable for finishing machining of steel, stainless steel and cast iron at high feed rates giving good surface finish. Machining range: f = .002–.024 ipr, a_p = .010–.160”
	W-MF5	Chipbreaker intended for medium finishing of steel at high feed. The geometry is very open and highly positive. Machining range: f = .008–.031 ipr, a_p = .008–.105”
	W-M3	Versatile chipbreaker for high feed finishing and medium-roughing machining of steel, stainless steel and cast iron. Operates in a wide application area. Gives a good surface finish even at high feeds. Machining range: f = .008–.035 ipr, a_p = .020–.240”
	W-R7	A strong easy cutting chipbreaker for single sided inserts. Intended for the highest feeds when medium-roughing and rough machining of steel, stainless steel and cast iron. Gives a good surface finish even at the higher feeds. Machining range: f = .016–.048 ipr, a_p = .080–.375”

STEP 5: GRADE, SPEED & FEED
GENERAL MACHINING RECOMMENDATIONS

	FINISHING	MEDIUM-ROUGH MACHINING	ROUGH MACHINING
Steel (ISO-P)	TP2501	TP2501	TP2501
Stainless Steel (ISO-M)	TM2000	TM2000	TM4000
Cast Iron (ISO-K)	TK1001	TK2001	TK2001
Hardened Steels (ISO-H)	TH1500	TH1500	–

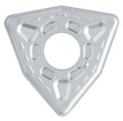
Reccommended grades shown above

FINISHING
at low depth of cut. Typical a_p = .008–.032" and f = .008 in/rev.

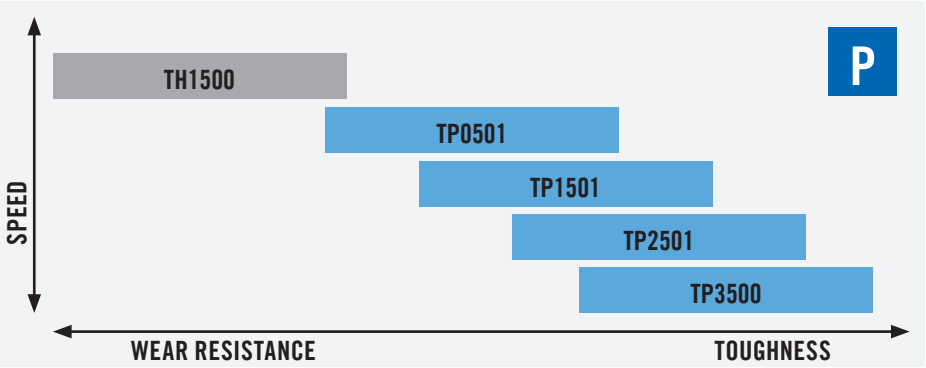
MEDIUM-ROUGH MACHINING
Typical one pass machining at a_p = .032–.120" and f = .012 in/rev.

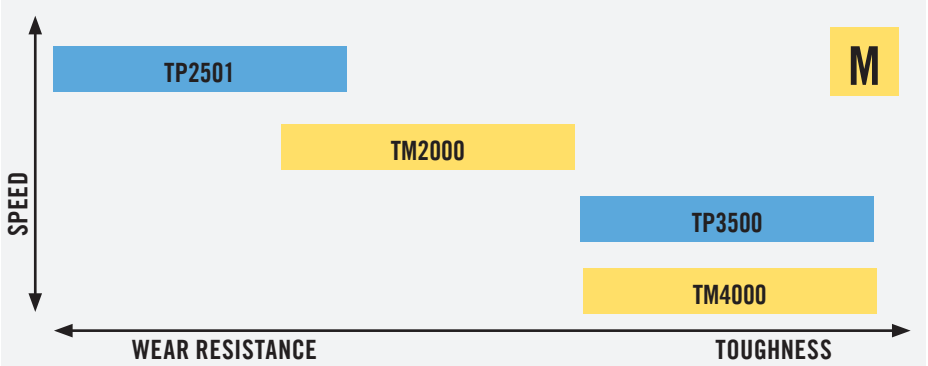
ROUGH MACHINING
at higher depth of cut and feed rate In most cases with difficult surface conditions such as scale, irregularities and other conditions leading to interruptions and edge damage. Typically a_p = .12–.28" and f = .02 in/rev.

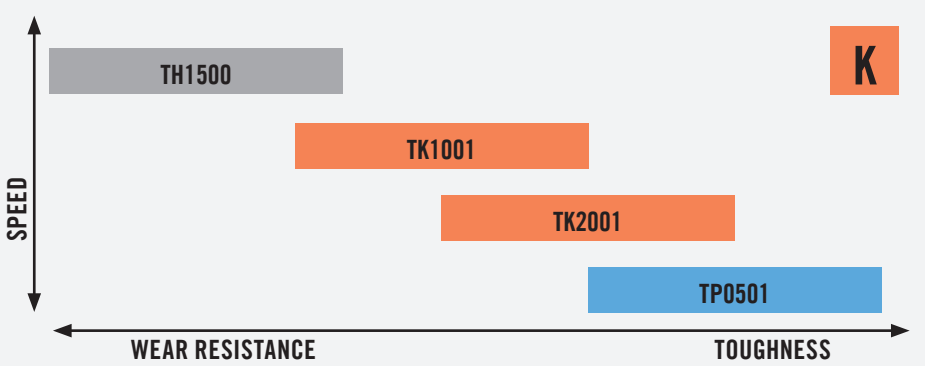
STEEL MACHINING

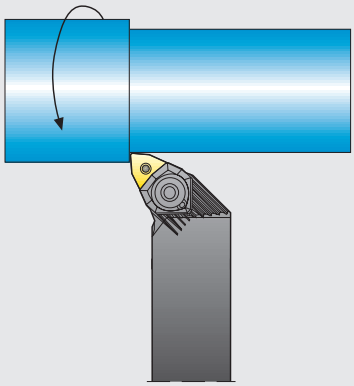


Available in a broad range of insert shapes and geometries for light, medium and roughing operations, TP2501, TP1501 and TP0501 insert grades provide the best selection in steel turning, whether your goal is versatile, balanced or high-speed productivity.









CUTTING DATA

CUTTING SPEED V_c (SF/MIN)

In this section a recommended cutting speed is indicated under specified conditions and a selected SMG (ver.2)

Use the tables below to classify the workpiece material into a SMG.

In order to increase the accuracy towards the actual cutting conditions and requirements of the applications the recommendation is to use **My Pages – Suggest on www.secotools.com**

Universal insert: CCMT32.51-MF2

Tool life = 15 min | a_p = 0.040 inch | rep = 0.016 inch | kar = 95°

	TP1501			TP2501		
	f (in/rev)			f (in/rev)		
SMG	0.006	0.008	0.010	0.006	0.008	0.010
P1	2675	2450	2275	2225	2075	1950
P2	2600	2400	2225	1850	1900	1900
P3	1750	1750	1700	1900	1950	1950
P4	1975	1825	1675	1650	1525	1450
P5	1475	1475	1425	1350	1400	1375
P6	2100	1950	1800	1750	1650	1550
P7	1550	1550	1500	1225	1325	1350
P8	1475	1475	1425	1350	1400	1375
P11	1500	1500	1475	1375	1450	1425

SMG = Seco Material Group kar (k_r) = cutting edge angle (°) (from holder) rep (r_e) = nose radius (inch) a_p = depth of cut (inch) f = feed rate (inch/rev)

Universal insert: CNMG432-M3

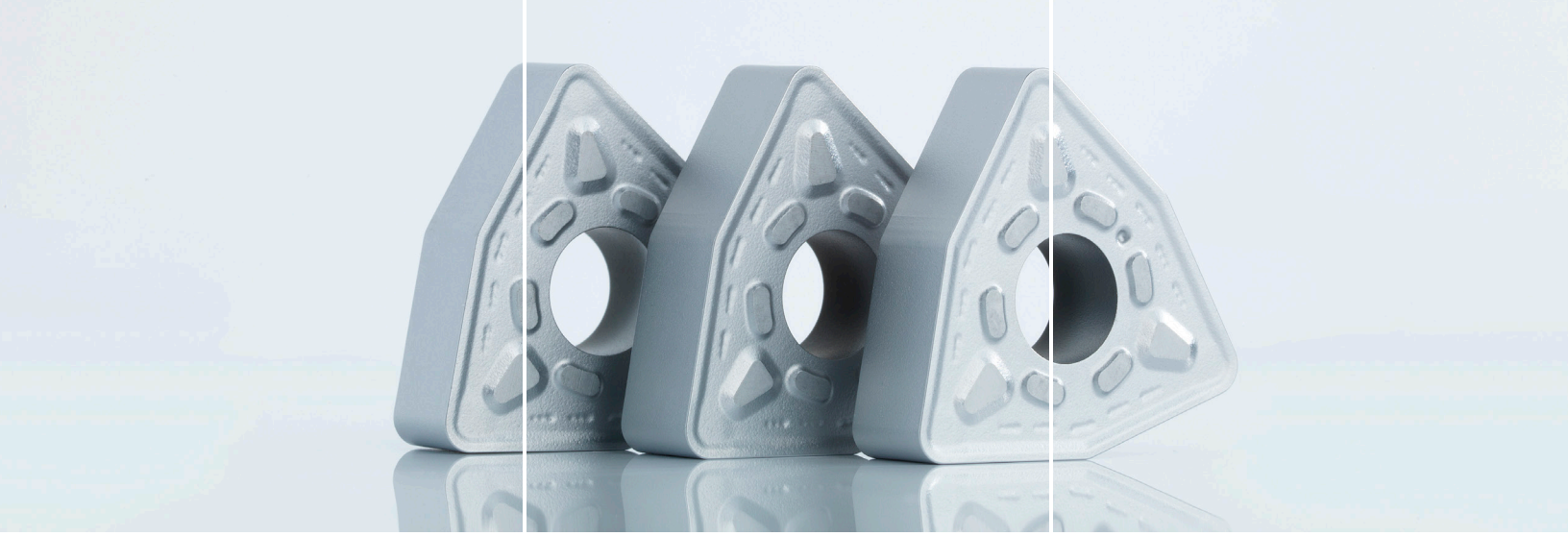
Tool life = 15 min | a_p = 0.100 inch | rep = 0.031 inch | kar = 95°

	TP0501			TP1501			TP2501		
	f (in/rev)			f (in/rev)			f (in/rev)		
SMG	0.008	0.012	0.016	0.008	0.012	0.016	0.008	0.012	0.016
P1	2550	2250	1975	2275	1925	1650	1925	1675	1475
P2	2475	2200	1925	2200	1875	1625	1825	1675	1500
P3	2050	1925	1675	1650	1475	1300	1875	1725	1525
P4	1875	1675	1475	1675	1400	1225	1425	1225	1075
P5	1725	1600	1400	1375	1250	1100	1325	1225	1075
P6	2025	1775	1575	1800	1525	1325	1525	1325	1150
P7	1825	1700	1500	1450	1325	1150	1275	1250	1125
P8	1725	1600	1400	1375	1250	1100	1325	1225	1075
P11	1775	1650	1450	1425	1275	1125	1375	1250	1100

Universal insert: CNMG644-MR7

Tool life = 15 min | a_p = 0.240 inch | rep = 0.062 inch | kar = 95°

	TP0501			TP1501			TP2501		
	f (in/rev)			f (in/rev)			f (in/rev)		
SMG	0.016	0.022	0.028	0.016	0.022	0.028	0.016	0.022	0.028
P1	1900	1550	1300	1600	1300	1100	1425	1175	1025
P2	1850	1500	1250	1550	1275	1075	1425	1150	910
P3	1600	1225	930	1250	1000	820	1450	1150	920
P4	1400	1150	950	1175	970	820	1050	870	750
P5	1350	1025	780	1050	840	690	1025	800	630
P6	1500	1225	1025	1250	1025	880	1125	940	810
P7	1425	1075	830	1100	890	730	1100	900	730
P8	1350	1025	780	1050	840	690	1025	800	630
P11	1375	1050	810	1075	860	710	1050	820	650



DURATOMIC® INSERT PROGRAM

CODE KEY

Chipbreaker designation
Letter:
F = Finishing
M = Medium
R = Roughing
First digit:
1 = Low edge strength
9 = High edge strength

Insert shape		Tolerances		I.C.		Nose radius			Chipbreaker designation	
C	C	M	T	4	3	2	W	-	F1	TP2501
	Side clearance angle		Insert type		Thickness		Cutting edge condition			Grade

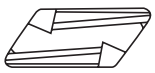
Insert size	Insert thickness	Insert nose radius
For equal sided inserts I.C. in 1/8ths of an inch. Examples: 1/8" = 1 5/32" = 1.2 3/16" = 1.5 7/32" = 1.8 1/4" = 2 5/16" = 2.5 3/8" = 3 1/2" = 4 5/8" = 5 3/4" = 6 7/8" = 7 1" = 8 1 1/4" = 10 Rectangle and parallelogram inserts require two digits: 1st Digit-Number of 1/8ths in width. 2nd Digit-Number of 1/4ths in length.	Number of 1/32nds on inserts less than 1/4" I.C.Number of 1/16ths on inserts 1/4" I.C. and over.	0.0 = Sharp to .002" 0 = Sharp to .004" 0.5 = .002" 1 = .016" 2 = .031" 3 = .047" 4 = .062" 6 = .094" 8 = .125"

DESCRIPTION	GRADE		
	TP2501	TP1501	TP0501
CCGX21.50.5W-F1	15856	-	-
CCGX32.50.5W-F1	15857	-	-
CCMT21.50.5-F1	15859	15858	-
CCMT21.50.5-FF1	19361	-	-
CCMT21.50.5-M3	19397	19356	-
CCMT21.50.5-MF2	14244	-	-
CCMT21.51-F1	19555	19554	-
CCMT21.51-FF1	19404	-	-
CCMT21.51-M3	19559	19523	-
CCMT21.51-MF2	14245	14937	14934
CCMT21.51W-F1	19338	-	-
CCMT21.51W-MF2	14246	-	-
CCMT21.52-F1	19588	-	-
CCMT21.52-M3	19463	-	-
CCMT21.52-MF2	14247	14939	14938
CCMT32.50.5-F1	19474	19369	-
CCMT32.50.5-M3	19371	19359	-
CCMT32.50.5-MF2	14248	-	-
CCMT32.51-F1	19594	19405	-
CCMT32.51-FF1	19486	-	-
CCMT32.51-M3	20359	19541	-
CCMT32.51-M5	14271	14941	14940
CCMT32.51-MF2	14249	14943	-
CCMT32.51W-F1	19161	19225	-
CCMT32.51W-MF2	14250	14944	-
CCMT32.52-F1	19599	19550	-
CCMT32.52-M3	19616	19613	-
CCMT32.52-M5	14272	14947	14945
CCMT32.52-MF2	14251	14952	14951
CCMT32.52W-F1	19306	19223	-
CCMT32.52W-M3	-	19353	-
CCMT32.52W-MF2	14252	14953	-
CCMT32.53-M3	19372	19366	-
CCMT321-M3	19358	-	-
CCMT431-F1	19482	-	-
CCMT431-M3	19516	19392	-
CCMT431W-F1	18965	-	-
CCMT432-F1	19551	-	-
CCMT432-M3	19617	19552	-
CCMT432-M5	14274	14955	14954
CCMT432-MF2	14253	14957	-
CCMT432W-F1	18975	-	-
CCMT433-F1	19367	-	-
CCMT433-M3	19408	19398	-
CCMT433-M5	14275	14962	14960
CCMT53.52-M3	19632	-	-
CCMT53.53-M5	14276	-	-
CCMT53.54-M5	14277	-	-
CNMG321-M3	17489	-	-
CNMG322-M3	17577	-	-
CNMG430.5-FF2	15587	-	-
CNMG431-FF1	17593	-	-
CNMG431-FF2	15588	-	-
CNMG431-M3	15328	-	-
CNMG431-M5	16492	-	-
CNMG431-MF2	15051	-	15009
CNMG431W-FF2	15589	-	-
CNMG431W-MF2	15673	15672	-
CNMG432-FF2	14293	15718	15591
CNMG432-M3	15333	15332	15330
CNMG432-M5	16097	16096	16095
CNMG432-M6	15109	15108	15104
CNMG432-MF2	15061	15022	15021
CNMG432-MF4	18500	-	-
CNMG432-MF5	18562	18559	18488
CNMG432-MR6	18163	18220	-
CNMG432-MR7	15977	15976	-
CNMG432W-FF2	14294	15592	-
CNMG432W-M3	15559	15557	15556

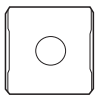
DESCRIPTION	GRADE		
	TP2501	TP1501	TP0501
CNMG432W-M6	15117	-	-
CNMG432W-MF2	15676	15675	15674
CNMG432W-MF5	16747	16713	-
CNMG433-M3	15339	15338	15335
CNMG433-M5	16104	16099	16098
CNMG433-M6	15125	15122	15120
CNMG433-MF2	15063	15723	15722
CNMG433-MF4	16493	-	-
CNMG433-MF5	15987	15983	15981
CNMG433-MR6	16054	16034	-
CNMG433-MR7	16060	16059	16057
CNMG433W-M3	15562	15561	15560
CNMG433W-M6	15127	15126	-
CNMG433W-MF2	-	-	15677
CNMG434-M3	15728	15724	-
CNMG434-M5	16106	16105	-
CNMG434-M6	15129	15128	-
CNMG434-MF5	16064	16062	-
CNMG434-MR7	16068	16065	-
CNMG542-M3	15341	15340	-
CNMG542-M5	16108	16107	-
CNMG543-M3	15346	15345	15342
CNMG543-M5	16496	16495	16494
CNMG543-M6	15132	15131	15130
CNMG543-MR7	16073	16072	16071
CNMG543W-M6	15133	-	-
CNMG544-M5	16113	16110	16109
CNMG544-M6	15137	15136	15134
CNMG544-MR7	16076	16075	16074
CNMG544W-M6	15139	15138	-
CNMG546-M6	15143	15142	-
CNMG546-MR7	-	16077	-
CNMG642-M3	15955	15954	-
CNMG642-M5	16116	16114	-
CNMG643-M3	15349	15348	-
CNMG643-M5	16502	16500	-
CNMG643-M6	*	*	*
CNMG643-MR7	16083	16081	16078
CNMG644-M3	15353	15956	-
CNMG644-M5	16503	-	-
CNMG644-M6	*	*	*
CNMG644-MR7	16529	16523	16086
CNMG646-M6	*	*	*
CNMG646-MR7	16089	16088	-
CNMG866-MR7	18769	18569	-
CNMM432-R4	17064	17020	-
CNMM432-R6	17424	-	-
CNMM433-R4	17075	17026	16845
CNMM433W-R4	16653	16690	-
CNMM434-R4	16911	16908	16863
CNMM543-R4	17062	16954	16932
CNMM543-RR6	17270	-	-
CNMM544-R4	16982	17045	16948
CNMM544-R5	-	17347	17444
CNMM544-R7	17137	-	17136
CNMM544-RR6	17155	17323	-
CNMM546-R7	-	-	17440
CNMM643-R4	17028	16925	16889
CNMM643-R7	17165	-	-
CNMM643-RR6	17172	-	-
CNMM644-MR6	-	18015	-
CNMM644-R4	16997	17081	16930
CNMM644-R5	-	-	17175
CNMM644-R7	17334	17181	-
CNMM644-RR6	17350	-	-
CNMM644W-R7	16693	16669	-
CNMM646-R4	16966	16952	16903
CNMM646-R5	-	-	17277
CNMM646-R7	17447	-	17192
CNMM646-RR6	17437	-	17206
CNMM646W-R7	16766	16658	16657

DESCRIPTION	GRADE		
	TP2501	TP1501	TP0501
DCMT21.50.5-F1	19787	-	-
DCMT21.50.5-M3	20284	20236	-
DCMT21.51-F1	19974	19919	-
DCMT21.51-M3	20296	20285	-
DCMT21.51-MF2	14255	14963	-
DCMT21.52-F1	-	19789	-
DCMT21.52-M3	20291	20265	-
DCMT32.50.5-F1	19971	-	-
DCMT32.50.5-FF1	19684	-	-
DCMT32.50.5-M3	20288	20237	-
DCMT32.50.5-MF2	14256	14964	-
DCMT32.51-F1	20179	19983	15860
DCMT32.51-FF1	19955	-	-
DCMT32.51-M3	20298	20293	15904
DCMT32.51-MF2	14257	14970	14966
DCMT32.52-F1	20220	20182	15862
DCMT32.52-FF1	19957	-	-
DCMT32.52-M3	20299	20289	-
DCMT32.52-M5	14278	14975	14971
DCMT32.52-MF2	14258	14977	14976
DCMT32.53-F1	19939	19920	-
DCMT32.53-M5	14283	-	-
DCMT32.53-MF2	14259	-	-
DCMT431-M3	20292	20266	-
DCMT432-M3	20294	20282	-
DCMT433-M3	20286	20283	-
DCMX32.51W-F1	19307	19130	-
DCMX32.52W-F1	19224	19308	-
DNMG431-FF2	15594	15593	-
DNMG431-M3	15407	15406	-
DNMG431-MF2	15064	15028	15023
DNMG432-FF2	14296	15600	15599
DNMG432-M3	15419	15417	15411
DNMG432-M5	16238	16237	16223
DNMG432-M6	15182	15180	-
DNMG432-MF2	15065	15031	15029
DNMG432-MF5	18251	18100	-
DNMG433-M3	15450	15445	15427
DNMG433-M5	16596	16595	-
DNMG433-M6	15184	15183	-
DNMG433-MF2	15066	-	-
DNMG433-MF5	18235	18025	-
DNMG434-M6	15188	-	-
DNMG441-FF2	15606	15605	-
DNMG441L-UX	17578	17510	-
DNMG441-M3	15455	15454	-
DNMG441-M5	16251	-	-
DNMG441-MF2	15067	15729	-
DNMG441R-UX	17597	17541	-
DNMG442-FF2	14297	15612	15611
DNMG442L-UX	17585	17559	-
DNMG442-M3	15463	15461	15458
DNMG442-M5	16267	16266	16258
DNMG442-M6	15190	15189	-
DNMG442-MF2	15068	15733	15732
DNMG442-MF4	18104	-	-
DNMG442-MF5	18238	18225	18222
DNMG442-MR7	-	16597	-
DNMG442R-UX	17596	17566	-
DNMG443-M3	15466	15734	15464
DNMG443-M5	16606	16605	16604
DNMG443-M6	15204	15192	15191
DNMG443-MF2	15069	15737	15736
DNMG443-MF5	18164	18230	18046
DNMG443-MR7	-	16412	16408
DNMG444-M3	15475	15738	-
DNMG444-M5	16610	16608	16607
DNMG444-M6	15211	15206	-
DNMG444-MF5	18181	-	-
DNMM442-R4	16801	16797	-
DNMM443-R4	16832	16833	16802
DNMM444-R4	16831	16819	-
DNMU330.5-M3	15483	15479	-
DNMU331-FF2	14298	15619	-
DNMU331-M3	15485	15739	-
DNMU331-MF2	15070	15034	15033
DNMU331-MF5	18182	-	-

DESCRIPTION	GRADE		
	TP2501	TP1501	TP0501
DNMU332-FF2	14299	15621	15620
DNMU332-M3	15504	15500	15496
DNMU332-M5	-	16277	-
DNMU332-M6	*	*	-
DNMU332-MF2	15071	15743	15741
DNMU332-MF5	18231	-	-
DNMU333-M3	-	15510	15509
DNMU333-M5	-	16280	-
DNMU333-M6	*	*	-
DNMU333-MF2	15072	-	-
DNMU333-MF5	18114	-	-
DNMX331W-MF2	15695	15694	-
DNMX332W-MF2	15697	15696	-
DNMX432W-M3	-	15563	-
DNMX433W-M3	-	15565	-
DNMX442W-M3	-	15568	15567
DNMX443W-M3	-	15570	15569



KNUX160405L-11	18923	18868	-
KNUX160405R-11	18948	18869	-
KNUX160410L-11	18870	-	-
KNUX160410R-11	18871	-	-



LNMX191940-MF	18828	18889	-
LNMX191940-MR	18846	18829	-
LNMX191940-R2	-	18872	18848
LNMX191940-RR94	-	18894	18849
LNMX301940-MF	18873	18850	-
LNMX301940-MR	18854	18852	-
LNMX301940-R2	-	18856	18855
LNMX301940-RR94	-	18857	18875
LNMX301940-RR97	-	18860	18859
LNMX401432-RR93	-	18862	18882
LNMX401432-RR96	18864	18863	-
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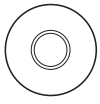


RCMT0602M0-F1	15863	-	-
RCMT0602M0-M3	15906	-	-
RCMT0803M0-F1	15864	-	-
RCMT0803M0-M3	15908	15907	-
RCMT10T3M0-F1	15865	-	-
RCMT10T3M0-M3	15911	15909	-
RCMT1204M0-F1	15867	15866	-
RCMT1204M0-M3	15913	15912	-
RCMT1606M0-F1	15870	15869	15868
RCMT1606M0-M3	15916	15915	15914
RCMX120400-RR94	20318	-	-
RCMX160600-RR94	20315	20313	-
RCMX200600-R2	20310	-	20309
RCMX200600-RR94	20314	20317	20316
RCMX200600-RR97	20312	-	20311
RCMX250700-R2	20334	-	20333
RCMX250700-RR94	20341	20345	20349
RCMX250700-RR97	20335	-	20342
RCMX320900-R2	20325	-	20321
RCMX320900-RR94	20336	20340	20347

DESCRIPTION	GRADE		
	TP2501	TP1501	TP0501
RCMX320900-RR97	20330	-	20328
RNMG43-M3	15528	15527	-

SCMT1268-RR97	-	-	20339
SCMT2.522-M3	15918	-	-
SCMT21.51-M3	15917	-	-
SCMT32.51-F1	15871	-	-
SCMT32.51-M3	15919	-	-
SCMT32.51-MF2	14260	-	-
SCMT32.52-F1	15880	-	-
SCMT32.52-M3	15927	15921	-
SCMT32.52-MF2	14261	-	-
SCMT432-F1	15884	-	-
SCMT432-M3	15946	15929	-
SCMT432-M5	14285	-	14978
SCMT432-MF2	14262	-	-
SCMT433-F1	-	15886	-
SCMT866-RR97	20338	-	20337
SNMG321-MF2	18499	-	-
SNMG322-M5	18259	-	-
SNMG322-MF2	18258	-	-
SNMG431-M3	15529	-	-
SNMG432-M3	15531	15530	-
SNMG432-M5	16611	-	-
SNMG432-M6	15280	15272	-
SNMG432-MF2	15073	15744	-
SNMG432-MR7	16420	16414	-
SNMG433-M3	15534	15533	-
SNMG433-M5	16303	16299	-
SNMG433-M6	15307	15297	-
SNMG433-MF2	15074	15035	-
SNMG433-MR7	16446	-	-
SNMG434-M3	15536	15535	-
SNMG434-M5	16312	16304	-
SNMG434-MR7	16470	-	-
SNMG542-M5	16316	-	-
SNMG543-M3	15538	15537	-
SNMG543-M5	16345	16320	-
SNMG543-M6	15313	15312	-
SNMG543-MR6	18210	-	-
SNMG543-MR7	16475	-	-
SNMG544-M5	16368	16360	16346
SNMG544-M6	15319	15316	15314
SNMG544-MR7	16476	-	-
SNMG643-M3	15539	-	-
SNMG643-M5	16612	-	-
SNMG643-M6	*	*	*
SNMG643-MR7	16489	-	-
SNMG644-M3	15540	-	-
SNMG644-M5	16622	16614	16407
SNMG644-M6	*	*	*
SNMG644-MR7	16637	16636	16490
SNMG646-M6	*	*	*
SNMG646-MR7	16491	-	-
SNMG866-MR7	18827	-	18617
SNMM433-R4	16775	-	-
SNMM543-R4	18475	-	-
SNMM544-R4	18507	-	18271
SNMM546-R7	17340	-	-
SNMM643-R4	16792	-	-
SNMM643-R7	17286	-	-
SNMM644-R4	16793	16784	16770
SNMM644-R5	17207	-	-
SNMM644-R57	17291	17408	-
SNMM644-R7	17421	-	-
SNMM644-RR6	17213	-	-
SNMM644W-R7	16694	-	-
SNMM646-R4	16790	-	16771
SNMM646-R5	17215	-	-
SNMM646-R57	-	-	17229

DESCRIPTION	GRADE		
	TP2501	TP1501	TP0501
SNMM646-R7	17346	-	17235
SNMM646-RR6	17315	-	-
SNMM646W-R7	16663	-	-
SNMM856-R56	18567	-	-
SNMM856-R57	18621	-	-
SNMM856-R7	18813	-	18627
SNMM856-RR6	18676	-	-
SNMM866-R68	18633	-	18629
SNMM866-R7	18821	-	18634
SPMR321-F1	18283	-	-
SPMR322-F1	18481	-	-
SPMR421-F1	18484	-	-
SPMR422-F1	17626	-	-
SPMR422-M3	17735	-	-
SPMR423-F1	18448	-	-
SPU421	17900	-	-
SPU422	17997	-	-
SPU633	17870	-	-
SPU634T	17835	-	-

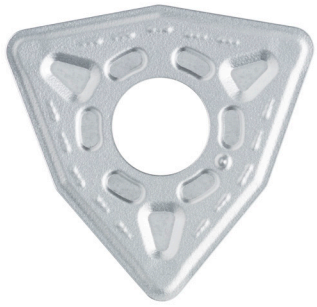
TCGX32.50.5WL-F1	15887	-	-
TCGX32.50.5WR-F1	15888	-	-
TCMT21.51-F1	15890	15889	-
TCMT21.51-MF2	14263	-	-
TCMT21.52-F1	15892	15891	-
TCMT21.52-MF2	14264	-	-
TCMT32.51-F1	15894	15893	-
TCMT32.51-M3	15948	15947	-
TCMT32.51-MF2	14265	-	-
TCMT32.52-F1	15896	15895	-
TCMT32.52-M3	15951	15949	-
TCMT32.52-M5	14286	-	14979
TCMT32.52-MF2	14266	-	-
TCMT32.53-F1	-	15897	-
TCMT32.53-M5	14288	-	-
TCMT432-M3	15953	15952	-
TCMX32.52W-F1	15903	15902	-
TNMG221-MF2	15746	-	-
TNMG331-FF2	15658	15623	-
TNMG331L-UX	17592	-	-
TNMG331-M3	15541	15747	-
TNMG331-M5	15957	-	-
TNMG331-MF2	15076	15748	-
TNMG331R-UX	17602	-	-
TNMG332-FF1	17574	17572	-
TNMG332-FF2	15659	15749	-
TNMG332L-UX	17591	-	-
TNMG332-M3	15546	15751	15750
TNMG332-M5	15966	15964	15960
TNMG332-M6	15323	15320	-
TNMG332-MF2	15077	15038	15037
TNMG332-MF5	18253	18240	-
TNMG332R-UX	17594	-	-
TNMG333-M3	15548	15752	-
TNMG333-M5	16640	16639	16638
TNMG333-M6	15326	15324	-
TNMG333-MF2	15078	15755	-
TNMG333-MF5	18136	18211	-
TNMG333-MR7	-	16646	-
TNMG431-M5	15967	-	-
TNMG431-MF2	15079	-	-
TNMG432-M3	15549	15757	-
TNMG432-M5	16649	16648	15968
TNMG432-M6	*	*	*
TNMG432-MF2	15080	15041	-
TNMG433-M3	15553	15550	-
TNMG433-M5	15971	15970	15969
TNMG433-M6	*	*	*
TNMG434-M5	15974	15973	15972
TNMG434-M6	*	*	*

DESCRIPTION	GRADE		
	TP2501	TP1501	TP0501
TNMG543-M3	18792	-	-
TNMG543-M5	18826	18677	-
TNMG543-M6	*	*	-
TNMG543-MR7	18684	-	-
TNMG544-M5	18669	18824	-
TNMG544-M6	*	*	-
TNMG544-MR7	18825	-	-
TNMG666-MR7	18690	-	-
TNMM332-R4	16795	-	-
TNMM333-R4	18493	-	-
TNMM432-R4	16796	-	-
TNMM433-R4	16794	16791	-
TNMM434-R4	16789	16800	-
TNMX332W-M3	15572	15571	-
TNMX333W-M3	-	15573	-
TPMR221-F1	17643	-	-
TPMR222-F1	18503	-	-
TPMR321-F1	17644	17605	-
TPMR321-M3	17750	-	-
TPMR322-F1	17611	17617	-
TPMR322-M3	17757	-	-
TPMR432-M3	17771	-	-
TPMR433-M3	17694	-	-
TPU321	17915	-	-
TPU322	18013	-	-
TPU431	17885	-	-
TPU432	17925	-	-
TPU433	18487	-	-

VBMT21.50.5-F1	19861	-	-
VBMT21.51-F1	19972	-	-
VBMT21.51-MF2	14267	14980	-
VBMT21.52-F1	19970	-	-
VBMT220.5-F1	19672	-	-
VBMT221-F1	19952	-	-
VBMT222-F1	19673	-	-
VBMT330.5-F1	19953	-	-
VBMT331-F1	20223	19973	-
VBMT331-M3	20300	20290	-
VBMT331-MF2	14268	14983	14981
VBMT332-F1	20235	20227	-
VBMT332-M3	20308	20295	20287
VBMT332-M5	14291	14986	14985
VBMT332-MF2	14269	14989	14988
VBMT333-F1	19862	20126	-
VBMT333-M3	20297	20267	-
VBMT333-MF2	14270	14994	14993
VNMG330.5-FF2	14302	15669	-
VNMG331-FF1	-	17571	-
VNMG331-FF2	14303	15670	-
VNMG331-M3	15512	15511	-
VNMG331-MF2	15090	15046	-
VNMG332-FF2	14304	15671	-
VNMG332-M3	15515	15770	15514
VNMG332-MF2	15092	15049	15048
VNMG333-MF2	15100	15050	-
VNMU2.531-M3	15520	15516	-
VNMU2.531-MF2	47502	47501	-
VNMU2.532-M3	15526	15524	15522
VNMU2.532-M6	*	*	-
VNMU2.532-MF2	47505	47504	-

WCMT32.52-F1	19956	-	-

DESCRIPTION	GRADE		
	TP2501	TP1501	TP0501
WCMT32.52W-F1	18970	-	-
WNMG330.5-M3	15373	-	-
WNMG331-FF2	15661	15660	-
WNMG331-M3	15374	15759	-
WNMG331-MF2	15082	15760	-
WNMG331-MF5	18140	-	-
WNMG331W-FF2	15662	-	-
WNMG331W-MF2	15704	15703	-
WNMG332-FF2	15665	15664	-
WNMG332-M3	15376	15763	15761
WNMG332-M5	16555	16550	16546
WNMG332-MF2	15083	15043	-
WNMG332-MF4	18191	-	-
WNMG332-MF5	18256	-	-
WNMG332W-FF2	15666	-	-
WNMG332W-M3	15575	15574	-
WNMG332W-MF2	15708	15706	-
WNMG332W-MF5	16696	16683	-
WNMG333-M3	15386	15382	15378
WNMG333-M5	16124	-	16120
WNMG333-MF2	15084	-	-
WNMG333-MF5	18087	18212	-
WNMG333W-M3	15577	15576	-
WNMG431-FF2	14300	15667	-
WNMG431-M3	15395	15764	-
WNMG431-MF2	15085	15765	-
WNMG431W-MF2	15709	-	-
WNMG432-FF2	14301	15668	-
WNMG432-M3	15397	15767	15766
WNMG432-M5	16589	16567	16560
WNMG432-M6	15151	15149	15145
WNMG432-MF2	15089	15044	-
WNMG432-MF4	18232	-	-
WNMG432-MF5	18257	18239	18144
WNMG432-MR6	18213	18202	-
WNMG432-MR7	16090	-	-
WNMG432W-M3	15582	15580	15578
WNMG432W-M6	15155	15152	-
WNMG432W-MF2	15716	15712	-
WNMG432W-MF5	16688	16687	-
WNMG433-M3	15402	15769	15768
WNMG433-M5	16592	16591	16590
WNMG433-M6	15159	15158	15156
WNMG433-MF2	-	15045	-
WNMG433-MF4	18203	-	-
WNMG433-MF5	18234	18161	18207
WNMG433-MR6	-	18215	-
WNMG433-MR7	16594	16593	-
WNMG433W-M3	15586	15585	15584
WNMG433W-M6	15163	15160	-
WNMG434-M3	15403	-	-
WNMG434-M5	16205	16189	16185
WNMG434-M6	15172	15165	15164
WNMG434-MF5	18250	-	-
WNMG434-MR7	16094	16093	-
WNMG443-M5	16210	16207	-
WNMG443-M6	15177	15175	15173
WNMG444-M5	16221	16216	-
WNMG444-M6	-	15178	-



***GRADES COMING SOON 2015.2**

TECHNICAL INFORMATION

NEW DURATOMIC GRADES FOR STEEL

TP0501 - The first choice for achieving the highest possible wear resistance and/or cutting speeds, TP0501 requires stable conditions to provide high performance. Ideal applications have low demands for edge toughness and lasting dimensional stability, even under high thermal loads. TP0501 will provide exceptional benefits when applied to very abrasive steels.

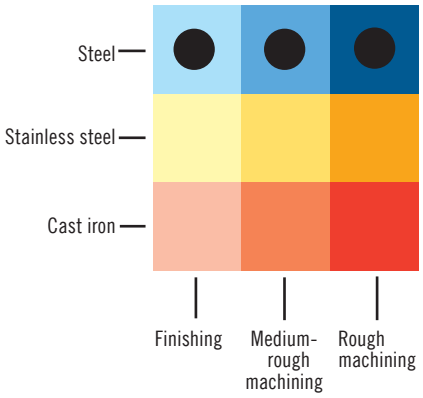
TP1501 - The first choice for high performance with well-balanced properties for different applications requiring high wear resistance and elevated cutting speeds. An estimated 20% of steel turning applications feature working conditions that demand TP1501's design properties, and it is generally most applicable to workpieces made from softer, low-alloy steels.

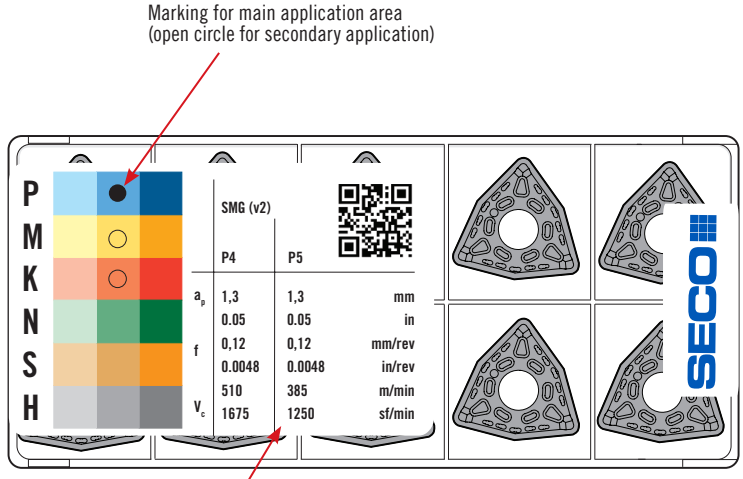
TP2501 - Where versatility is needed and working conditions may not be perfect, TP2501 is the first choice for maximizing manufacturing output under most varying productivity, cutting data and workpiece material requirements. An estimated 25% of steel turning applications feature working conditions that demand TP2501's grade design and properties.

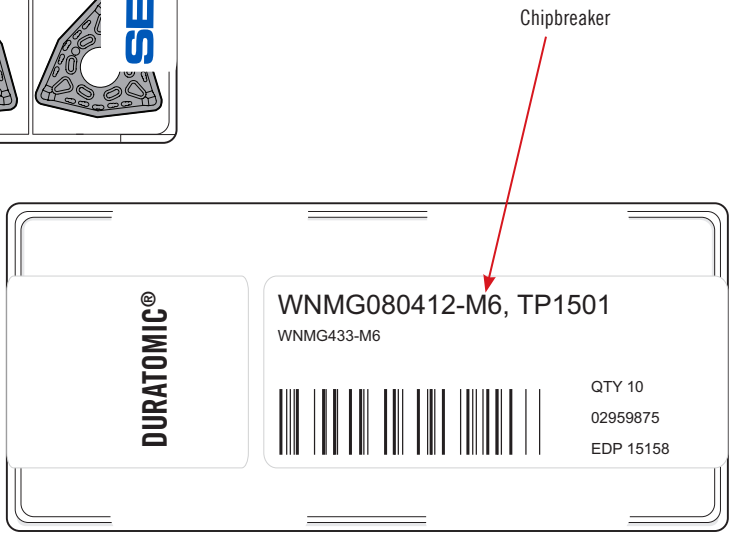
INDIVIDUAL CUTTING DATA ON THE INSERT BOX

The box features cutting data specific to the parts within:

- This cutting data for WNMG433-M6 can be used as an example for referencing the SMGv2 steel classification. It comes from the same one-source cutting data service that is used for box label data, data in MyPages and catalogs
- The new SMGv2-based box label incorporates a QR code to provide a direct link to a product-specific cutting data page in MyPages. Cutting data comes from a single source and is populated across all Seco platforms for consistency.







SAVE MONEY WITH EDGE INTELLIGENCE

We have worked to improve the **DURATOMIC®** turning inserts – to give you competitive benefits when it comes to **versatile production, high speed production and balanced production.**
And the Edge Intelligence ensures that you don't throw away inserts with unused edges.
So, get the chrome ones!

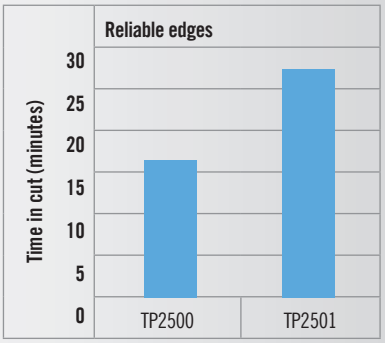
CAN YOU SPOT THE INSERT WITH USED EDGES?

TP2501, TP1501 & TP0501
CASE STUDY

RESULT: +50% tool life as well as no broken edges increased productivity

TP2501: FLANK-WEAR AND HEAT RESISTANCE WITH SUFFICIENT TOUGHNESS

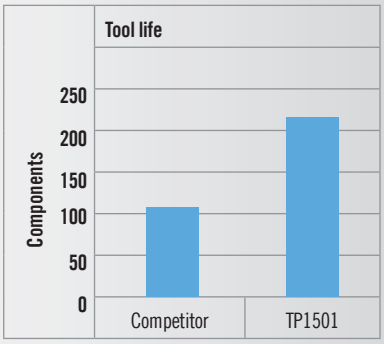
Part	**Rock drill coupling**
Workpiece material	**4340**
SMGv2	**SMG P5**
Operation	**Longitudinal turning**
Cutting mode	**Continuous and interrupted cut**
vc (sf/min)	**820**
ap (in)	**0.010“**
f (inch/rev)	**0.014“**
Coolant	**Yes**
Insert geometry	**WNMG433-MF5**



TP2501

TP1501: FLANK-WEAR AND HEAT RESISTANCE

Part	**Pulley hub**
Workpiece material	**6150**
SMGv2	**SMG P4**
Operation	**Profile turning**
Cutting mode	**Continuous**
vc (sf/min)	**1050**
ap (in)	**0.030“**
f (inch/rev)	**0.014**
Coolant	**Yes**
Insert geometry	**WNMG332-M3**



TP1501

Competitor
130 components

TP1501
250 components

Result: +90% tool life and more reliable behavior

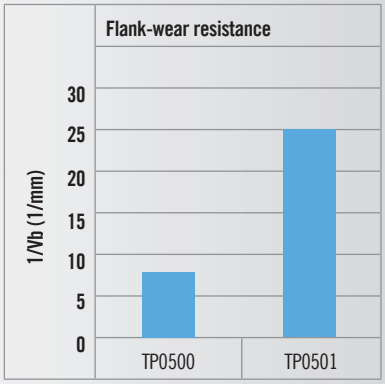
TP0501: FLANK-WEAR RESISTANCE AND TOUGHNESS BEHAVIOR

TP0500

TP0501

Result: TP0501 provides toughness enough to make the flank wear resistance determining the tool life. The flank wear resistance proves to be significantly better (+200%).

Part	**Transmission shaft**
Workpiece material	**4340, Forged**
SMGv2	**SMG P5**
Operation	**Facing, profiling, 200pcs, fixed batch size**
Cutting mode	**Continuous and interrupted**
vc (sf/min)	**650**
ap (in)	**0.060“**
f (inch/rev)	**0.014“**
Coolant	**Yes**
Insert geometry	**CNMG433-M5**



TP0501

EDGE INTELLIGENCE

CONTACT YOUR LOCAL AUTHORIZED DISTRIBUTOR

HOW TO ORDER SECO PRODUCT

GO ONLINE

Find your local Seco Authorized Distributor at SECOTOOLS.COM/US/DIST

CALL OR EMAIL

Our Customer Service department is happy to help you select an Authorized Distributor in your area. They can be reached at 1-800-832-8326 or customerservice@secotools.com.

WHAT YOU NEED TO KNOW

The required details for your order are shown in the table below.

PRODUCT DESCRIPTION	EXAMPLE: WNMG433-M6
PRODUCT EDP	EXAMPLE: 15158
PRODUCT QUANTITY	EXAMPLE: 40

ORDERING INSTRUCTIONS:

1. Contact your local Seco Authorized Distributor.
2. Select your product(s).
3. Provide the EDP and quantity along with your purchase order.
4. Fax, phone or email your order to your Seco Authorized Distributor.

EXPERIENCE DURATOMIC IN ACTION!

DURATOMIC® AT YOUR FINGERTIPS

DURABLE + ATOMIC = DURATOMIC

The result, Duratomic with an extreme level of both toughness and wear resistance, Duratomic will become the framework for coating development for years to come.

The first coating that has been manipulated on an atomic level. The basic structure is Aluminium Oxide, as it represents a very good starting point for machining steel, but the coating's overall ductility has also been significantly enhanced. The cumulative result is improved mechanical and thermal properties together with altered toughness, far beyond the capabilities of any existing grade on the market.

THINK SMALL

"In order to think big, we first had to think small, very small" says Roger Granström, Marketing Product Manager, referring to the atomic manipulation.

"PVD (Physical Vapor Deposition) and CVD (Chemical Vapor Deposition) coatings have performed very well for many years and will continue to do so in many applications, but our focus was to develop a brand new process to offer customers increased capabilities and to address current challenges to improve their competitive standing. Duratomic, the best coating we have ever produced, has provided that boost".

DURATOMIC.COM

FOR OTHER APPLICATION VIDEOS VISIT: YOUTUBE.COM/SECOTOOLSUS

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SECOTOOLS.COM/US

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1-800-832-8326

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