

**SECO  
NEW  
TOOLING &  
EXPANSIONS**



**2016.1 NEW  
PRODUCT LAUNCH**

## RELENTLESS IMPROVEMENT

The Square T4 family just got even better with the larger LOEX 12 insert. The Square T4-12 enables higher depths of cut and higher metal removal rates.



# THE TOOLS THAT MAKE UP YOUR SUCCESS

## PRODUCTIVITY COST ANALYSIS

# PCA

Learn more about how to evaluate a process and identify where to reduce cost for a significant productivity gain.

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# COMPETENCE DRIVEN SOLUTIONS

Welcome to the 2016.1 New Product Launch, where you will find several new metal cutting solutions that further expand the capabilities and productivity advantages of our milling tooling system and stationary product lines.

Among these latest solutions are larger insert sizes for the T4-12 square shoulder and helical cutters, reduced necks for the Jabro-Solid<sup>2</sup> JS554 series and PCBN grades for hard part turning, just to name a few.

These product line expansions reflect more than 80 years of metalworking experience, comprehensive technical know-how and an overall company commitment to developing the best possible products for every parts manufacturer in every industry segment.

# SQUARE SHOULDER MILLING



## SUPERIOR MATERIAL REMOVAL RATES

# SQUARE T4-12

The new Square T4-12 is an addition to the SQT4-08 range Seco launched in 2014. The SQT4-12 is offered with a larger insert utilizing the same tangential mounting concept. The SQT4-12 provides an ideal balance of high performance and cost effectiveness. Strong, reliable pocket seats combined with multi-edge inserts optimize stability and provide true 90° walls. Inserts are mounted tangentially, providing the strength needed for increased depths of cut with small diameters. Square T4-12 provides a smooth cutting action through the use of positive rake angles with a variable lead angle of the cutting edge. The cutter excels in cast iron and steel applications, and is ideal for contouring difficult-to-machine materials.

### YOUR SECO BENEFIT

- Economical high performance due to four cutting edges
- Increased metal removal rates through innovative cutter design

### RANGE OVERVIEW

- $D_c = 1.00'' - 5.00''$   
(25 - 125 mm)
- $a_p \text{ max} = 0.500''$   
(12.7 mm)
- Mounting types: Arbor connection (R220.94-12), Cylindrical, Cylindrical/Weldon (R217.94-12), Capto (R217.94-12)
- Geometries: M12 first choice for machining steel and easy stainless steels, MD13 first choice for machining cast iron materials
- Grades: MP1500, MP2500, and MP3000 intended for steel applications, MK1500 and MK2050 intended for cast iron, T350M and F40M intended for stainless, MM4500 for difficult and unstable conditions, MS2050 - Titanium and Titanium Alloys
- Radius Range:  $r_c = 0.0315'' - 0.122''$  (0.8 mm - 3.1 mm)

# SQUARE SHOULDER MILLING

# SQUARE T4-12

## NEW SQUARE T4-12 - R217.94 & R220.94

MOUNTING	EDP	DESCRIPTION	DIMENSIONS IN INCH										LB		INSERT		
			D <sub>c</sub>	D <sub>5m</sub>	dm <sub>m</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	M	l <sub>p</sub>	a <sub>p</sub>						
CYLINDRICAL / WELDON		Inch															
	29058	R217.94-01.00-3-12-2A	1.00	-	1.00	-	4.00	1.18	-	-	0.472	2	0.9	14000	LOEX12		
	29109	R217.94-01.25-3-12-3A	1.25	-	1.25	-	4.25	1.18	-	-	0.472	3	1.5	12400	LOEX12		
	29118	R217.94-01.50-3-12-4A	1.50	-	1.50	-	4.72	1.18	-	-	0.472	4	2.4	11300	LOEX12		
CYLINDRICAL	29122	R217.94-01.00-0-12-2A	1.00	-	1.00	-	6.69	1.18	-	-	0.472	2	1.5	13900	LOEX12		
	29123	R217.94-01.25-0-12-3A	1.25	-	1.25	-	7.68	1.18	-	-	0.472	3	2.6	14600	LOEX12		
	29124	R217.94-01.50-0-12-4A	1.50	-	1.50	-	8.27	1.18	-	-	0.472	4	4	13200	LOEX12		
COMBIMASTER	29125	R217.94-01.25-16RE-12-3A	1.25	1.18	-	1.57	-	1.18	M16	-	0.472	3	0.7	11800	LOEX12		
	29126	R217.94-01.50-20RE-12-3A	1.50	1.44	-	1.57	-	1.18	M20	-	0.472	3	0.7	9900	LOEX12		
	29127	R217.94-01.50-20RE-12-4A	1.50	1.44	-	1.57	-	1.18	M20	-	0.472	4	0.7	9900	LOEX12		
SECO-CAPTO	29129	C4-R217.94-02.00-12-4A	2.00	1.57	-	2.36	-	2.36	-	-	0.472	4	1.5	10600	LOEX12		
	29130	C5-R217.94-02.50-12-5A	2.50	1.97	-	2.36	-	2.36	-	-	0.472	5	2.4	10200	LOEX12		
ARBOR	29170	R220.94-01.50-12-4A	1.50	1.38	-	1.57	-	-	-	-	0.472	4	0.7	16400	LOEX12		
	29171	R220.94-02.00-12-5A	2.00	1.85	-	1.57	-	-	-	-	0.472	5	1.1	14800	LOEX12		
	29196	R220.94-02.00-12-6A	2.00	1.85	-	1.57	-	-	-	-	0.472	6	1.1	14800	LOEX12		
	29211	R220.94-02.50-12-6A	2.50	1.85	-	1.57	-	-	-	-	0.472	6	1.5	13200	LOEX12		
	29212	R220.94-02.50-12-8A	2.50	1.85	-	1.57	-	-	-	-	0.472	8	1.5	13200	LOEX12		
	29213	R220.94-03.00-12-8A	3.00	2.44	-	1.97	-	-	-	-	0.472	8	2.6	8000	LOEX12		
	29215	R220.94-04.00-12-10A	4.00	3.54	-	1.97	-	-	-	-	0.472	10	4.9	7000	LOEX12		
29216	R220.94-05.00-12-12A	5.00	3.54	-	2.48	-	-	-	-	0.472	12	8.2	6200	LOEX12			

## NEW SQUARE T4-12 - R217.94 & R220.94

MOUNTING	EDP	DESCRIPTION	DIMENSIONS IN MM										KG		INSERT		
			D <sub>c</sub>	D <sub>5m</sub>	dm <sub>m</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	M	l <sub>p</sub>	a <sub>p</sub>						
CYLINDRICAL / WELDON		Metric															
	28868	R217.94-2525.3-12-2A	25	-	25	-	101	30	-	-	12	2	0.9	14000	LOEX12		
	28869	R217.94-3232.3-12-3A	32	-	32	-	110	30	-	-	12	3	1.5	12400	LOEX12		
SECO / WELDON	28889	R217.94-2532.3S-12-3A	32	-	25	-	110	30	-	-	12	3	1.5	12400	LOEX12		
	28894	R217.94-3240.3S-12-4A	40	-	32	-	120	30	-	-	12	4	2.9	11100	LOEX12		
	28914	R217.94-3240.3S-12-5A	40	-	32	-	120	30	-	-	12	5	2.9	11100	LOEX12		
CYLINDRICAL	28927	R217.94-2525.0-12-2A	25	-	25	-	170	114	-	-	12	2	1.1	16500	LOEX12		
	28944	R217.94-3232.0-12-3A	32	-	32	-	195	135	-	-	12	3	2.6	11100	LOEX12		
	28945	R217.94-3240.0-12-4A	40	-	32	-	210	150	-	-	12	4	3.1	9900	LOEX12		
	28946	R217.94-3240.0-12-5A	40	-	32	-	210	150	-	-	12	5	3.1	9900	LOEX12		
COMBIMASTER	28947	R217.94-1632.RE-12-3A	32	32	-	40	-	30	M16	-	12	3	0.7	11100	LOEX12		
	28975	R217.94-2040.RE-12-3A	40	36	-	40	-	30	M20	-	12	3	0.7	9900	LOEX12		
	28976	R217.94-2040.RE-12-5A	40	36	-	40	-	30	M20	-	12	5	0.7	9900	LOEX12		
SECO-CAPTO	28979	C4-R217.94-044-12-4A	44	40	-	60	-	60	-	-	12	4	1.3	11300	LOEX12		
	28982	C4-R217.94-044-12-5A	44	40	-	60	-	60	-	-	12	5	1.5	11300	LOEX12		
	28989	C5-R217.94-054-12-5A	54	50	-	60	-	60	-	-	12	5	2.2	10200	LOEX12		
	28990	C5-R217.94-054-12-6A	54	50	-	60	-	60	-	-	12	6	2.2	10200	LOEX12		
	28991	C6-R217.94-066-12-6A	66	63	-	60	-	60	-	-	12	6	3.5	8600	LOEX12		
	28992	C6-R217.94-080-12-9A	80	63	-	60	-	60	-	-	12	9	4.2	7800	LOEX12		
SHELL ARBOR	29607	R220.94-0040-12-4A	40	35	-	40	-	-	-	-	12	4	0.7	11800	LOEX12		
	28994	R220.94-0040-12-5A	40	35	-	40	-	-	-	-	12	5	0.9	11800	LOEX12		
	28996	R220.94-0050-12-5A	50	47	-	40	-	-	-	-	13	5	1.1	10600	LOEX12		
	28998	R220.94-0050-12-6A	50	47	-	40	-	-	-	-	13	6	1.1	10600	LOEX12		
	28999	R220.94-0063-12-6A	63	52	-	40	-	-	-	-	13	6	1.5	9400	LOEX12		
	29010	R220.94-0063-12-8A	63	52	-	40	-	-	-	-	13	8	1.5	9400	LOEX12		
	29011	R220.94-0080-12-7A	80	62	-	50	-	-	-	-	12	7	2.9	8400	LOEX12		
	29012	R220.94-0080-12-10A	80	62	-	50	-	-	-	-	12	10	2.9	8400	LOEX12		
	29016	R220.94-0100-12-9A	100	77	-	50	-	-	-	-	12	9	4	7500	LOEX12		
	29017	R220.94-0100-12-12A	100	77	-	50	-	-	-	-	12	12	4.2	7500	LOEX12		
29039	R220.94-0125-12-12A	125	90	-	63	-	-	-	-	12	12	7.3	6700	LOEX12			
29057	R220.94-0125-12-15A	125	90	-	63	-	-	-	-	12	15	7.5	6700	LOEX12			

# SQUARE T4-12 INSERT OFFERING

**NEW LOEX INSERTS FOR SQUARE T4-12**

DESCRIPTION	r <sub>e</sub>	MP1500	MP2500	MP3000	MK1500	MK2050	T350M	MM4500	F40M	MS2050	T25M
LOEX120708TR-M12	0.0315		52853	52854		52857	52852	52855	52858	52856	52859
LOEX120712TR-M12	0.0470						52860	52861	52862		
LOEX120716TR-M12	0.0630					52863			52864		
LOEX120720TR-M12	0.0790		52866	52867			52865	52868	52869		
LOEX120724TR-M12	0.0940								52870	52872	
LOEX120731TR-M12	0.1220		52874	52878			52873	52879	52882	52881	
LOEX120708TR-MD13	0.0315	52885	52886		52892	52893	52884	52894	52897		52900
LOEX120712TR-MD13	0.0470	52904	52905		52907	52910	52902		52911		
LOEX120716TR-MD13	0.0630	52913	52914		52915	52918	52912		52919		

Square T4-12 incorporates a tangentially mounted insert with an edge length of 0.500". This means that even smaller diameter tools have higher depth of cut capability. This comes in handy when profiling deep walls in tight spaces. Very smooth cutting action generates low cutting forces, better chip evacuation, and low noise levels giving better tool life. Edge geometries, grades, and several radii options for all materials offer economical versatility.



# SQUARE SHOULDER MILLING



## INCREASED DEPTH OF CUT FOR HIGHER METAL REMOVAL SQUARE T4-12 HELICAL

The new T4-12 Helical milling cutters feature larger, tangentially mounted inserts, each with four cutting edges. The cutters allow for increased depths of cut and higher machining parameters for roughing and semi-finishing of steels, cast irons and various difficult materials.

Tangential mounting reinforces insert stability, improves chip flow and provides unrestricted access to mounting screws, while multiple cutting edges help reduce tool cost per part. The curved-edge inserts are available in high-positive-rake geometries and corner radii up to 0.122" (3.1 mm) in the front row to address a wide variety of workpiece requirements.

The cutters, in normal-pitch versions, perform slotting and contouring applications. Close-pitch versions do contouring only, with radial width-of-cut capability of 30% in full axial depth of cut.

# SQUARE T4-12 HELICAL

## PRODUCT OVERVIEW

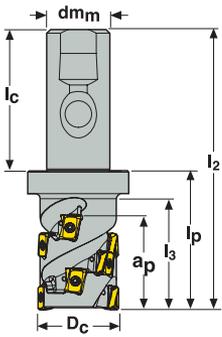
- Larger size inserts with four cutting edges reduce tooling costs
- Tangential insert mounting adds stability and support
- High positive rakes and curved edges provide smooth, vibration-free cutting

## RANGE OVERVIEW

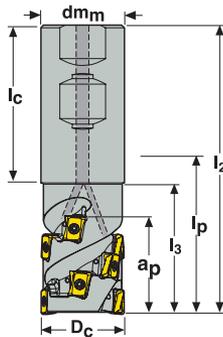
- Cutter diameters from 2" - 4" (50 mm - 100 mm)
- Arbor, Weldon, and Seco Weldon mounting systems
- Wide selection of insert grades and geometries
- Normal and close pitch versions
- Corner radii from 0.031" - 0.122" (0.8 mm - 3.1 mm)

## YOUR SECO BENEFIT

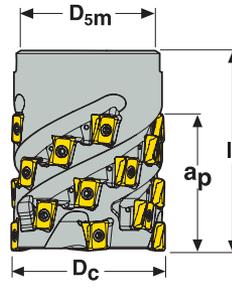
- Greater productivity
- Reduced tool costs
- Smoother machining
- Process reliability and stability
- Improved chip flow



SECO / WELDON



CYLINDRICAL / WELDON



ARBOR



## NEW SQUARE T4-12 HELICAL - R217.94 & R220.94

MOUNTING	EDP	DESCRIPTION	DIMENSIONS IN INCH/MM										Zc		LB/KG		INSERT
			Dc	d5m	dm	lc	l1	l2	l3	lp	ap						
CYLINDRICAL / WELDON	29361	R217.94-02.00-3-1.37-12-3A	2.00	-	1.50	3.74	-	4.93	2.20	2.24	1.409	3	9	2.6	9800	LOEX12	
	29363	R217.94-02.00-3-2.28-12-4A	2.00	-	1.50	3.03	-	5.71	2.99	4.53	2.310	4	20	2.9	9800	LOEX12	
ARBOR	29380	R220.94-02.00-1.81-12-3A	2.00	1.86	1.00	-	2.756	-	-	-	1.860	3	12	1.3	9800	LOEX12	
	29468	R220.94-02.00-2.28-12-4A	2.00	1.86	1.00	-	3.150	-	-	-	2.310	4	20	1.5	9800	LOEX12	
	29493	R220.94-02.50-1.81-12-4A	2.50	2.37	1.00	-	2.559	-	-	-	1.868	4	16	2.2	8800	LOEX12	
	29501	R220.94-02.50-3.18-12-4A	2.50	2.37	1.00	-	3.661	-	-	-	3.211	4	28	2.9	8800	LOEX12	
	29526	R220.94-03.00-3.18-12-5A	3.00	2.87	1.25	-	3.740	-	-	-	3.211	5	35	4.4	8000	LOEX12	
SECO/WELDON	29558	R220.94-04.00-3.18-12-6A	4.00	2.87	1.50	-	3.661	-	-	-	3.211	6	42	8.6	7000	LOEX12	
	Metric																
SECO/WELDON	29231	R217.94-3250.3S-035-12.3A	50	50	32	60	-	120	51	60	35	3	9	1.0	9900	LOEX12..	
	29235	R217.94-3250.3S-058-12.4A	50	50	32	75	-	135	66	75	58	4	20	1.1	9900	LOEX12..	
ARBOR	29236	R220.94-00050-046-12.3A	50	46.4	27	-	70	-	-	-	47	3	12	0.5	9900	LOEX12..	
	29283	R220.94-00050-058-12.4A	50	46.4	27	-	80	-	-	-	58	4	20	0.6	9900	LOEX12..	
	29299	R220.94-00063-046-12.4A	63	59.6	27	-	65	-	-	-	47	4	16	0.9	8800	LOEX12..	
	29317	R220.94-00063-058-12.5A	63	59.6	27	-	75	-	-	-	58	5	25	1.1	8800	LOEX12..	
	29318	R220.94-00063-081-12.4A	63	59.6	27	-	93	-	-	-	81	4	28	1.3	8800	LOEX12..	
	29328	R220.94-00080-069-12.5A	80	76.6	32	-	90	-	-	-	70	5	30	2.2	7800	LOEX12..	
	29355	R220.94-00100-081-12.6A	100	96.7	40	-	93	-	-	-	81	6	42	3.7	7000	LOEX12..	

For Cutting Data see pages 40-41



## ADJUSTABLE MULTI EDGE SOLUTION

# DOUBLE OCTOMILL™ 05 CASSETTE

Seco expands the benefits of its recently developed Double Octomill 09 cassette technology into the Double Octomill 05 family of smaller diameter inserted face milling cutters.

Using Seco's advanced pin-locating technology, the new cassettes ensure fast, easy and precise insert positioning. But equally important, the patented design of the cassette pockets allows adjustability to practically eliminate axial runout, while optimizing feed rates, surface finishes and tool life.

Cassettes are paired with cutter bodies that accommodate Seco's cost-effective Double Octomill inserts with 16 cutting edges. Because the cassettes are modular and removable, they can be quickly and inexpensively replaced if damaged, avoiding the cost of replacing an entire cutter body.

### PRODUCT OVERVIEW

- Removable cassettes
- High-speed steel pins for precise insert locating
- Strong center insert-mounting screws
- Unique pocket design with bottom insert support
- Z-axis adjustable insert pockets

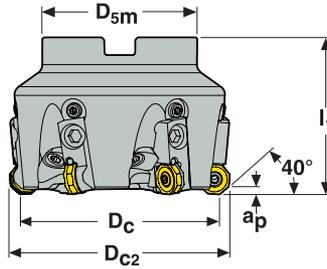
### RANGE OVERVIEW

- Available in inch range from 3" to 8" (as standard)
- Diameters from 80 mm to 200 mm
- 16-cutting-edge inserts
- Both roughing and finishing for all workpiece material types

### YOUR SECO BENEFIT

- Economical, high-performance cutting system
- Low cost per edge and low cost per part
- Easy, precise and foolproof insert mounting, locating and adjusting
- Near zero axial runout
- Reduced maintenance and repair costs
- Superior surface finishes
- Extended tool life

# MILLING



## NEW DOUBLE OCTOMILL - 220.48-05

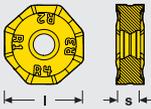
EDP	DESCRIPTION	DIMENSIONS IN INCH/MM						Z <sub>c</sub> *	LB/KG		INSERT
		D <sub>c</sub>	dc <sub>2</sub>	D <sub>5m</sub>	dm <sub>m</sub>	I <sub>1</sub>	a <sub>p</sub>				
Inch											
52775	R220.48-03.00-05-6CS	3.15	3.46	2.44	1.00	2.48	0.118	6	4.4	11400	ON..05
52777	R220.48-04.00-05-8CS	3.94	4.25	3.03	1.50	2.48	0.118	8	6.6	10200	ON..05
52778	R220.48-05.00-05-10CS	4.92	5.24	3.54	1.50	2.48	0.118	10	9.9	9100	ON..05
52779	R220.48-06.00-05-14CS	6.30	6.61	5.12	2.00	2.48	0.118	14	13.2	8000	ON..05
52780	R220.48-808.00-05-18CS	7.87	8.19	5.12	2.50	2.48	0.118	18	19	7200	ON..05
Metric											
52769	R220.48-0080-05-6CS	80	88	62	27	63	3	6	1.7	11400	ON..05
52770	R220.48-0100-05-8CS	100	108	77	32	63	3	8	3	10200	ON..05
52771	R220.48-0125-05-10CS	125	133	90	40	63	3	10	4	9100	ON..05
52772	R220.48-8160-05-14CS	160	168	140	40	63	3	14	6.5	8000	ON..05
52773	R220.48-8200-05-18CS	200	208	160	60	63	3	18	9	7200	ON..05

For Cutting Data see pages 42-44

## ALL NEW!

# ONEU WIPER M12

## NEW ONEU WIPER M12

 M12	DESCRIPTION	B	Cutting rake	Grades (EDP)											
				Coated										Cermet	
				MP 1500	MP 2500	MP 3000	MM4500	MK1500	MK2050	MS2050	MS2500	T350M	F40M		MP 1020
	ONEU 090520ZZTN4-M12*	0.248	20.0°	52849	52850					52851					

\*ONEU wiper inserts have 4 right hand and 4 left hand cutting edges.



## CLOSE-PITCH VERSION LOCKS IN FACE MILLING PERFORMANCE & STRENGTH QUATTROMILL®

Thanks to a special patented center-locking insert screw design, Seco now offers its popular general-purpose Quattromill face milling cutters in a new close-pitch version. The new face mills put more teeth/inserts in the cut for higher feed rates, improved surface finishes and increased productivity.

Instead of locking from the front, Seco's innovative insert screw locks/operates from the back of the insert pocket, eliminating the need for wedges or other extra parts and accommodating more inserts per cutter diameter. Seco was also able to significantly increase the density and strength of the Quattromill close-pitch cutter bodies.

Quattromill face mills are free cutting, feature positive cutting rake/negative radial rake geometries and accommodate a wide range of standard inserts for all workpiece materials. Due to their cutter geometries, the face mills excel in both stable and unstable machining conditions.

### NEW QUATTROMILL - R220.53

PITCH	EDP	DESCRIPTION	DIMENSIONS IN INCH/MM						LB/KG		INSERT
			D <sub>c</sub>	dc <sub>2</sub>	D <sub>5m</sub>	l <sub>1</sub>	a <sub>p</sub>	Z <sub>c</sub> *			
		Inch									
24483	R220.53-03.00-12-11A		3.15	3.62	2.44	1.97	0.236	11	2.6	11700	SE..1204
24484	R220.53-04.00-12-12A		3.94	4.41	3.03	1.97	0.236	12	3.7	10500	SE..1204
24501	R220.53-05.00-12-14A		4.92	5.39	3.54	2.48	0.236	14	7.5	9400	SE..1204
24502	R220.53-6.00-12-17		6.30	6.77	5.12	2.48	0.236	17	11.5	8300	SE..1204
18845	R220.53-808.00-12-20		7.87	8.35	5.12	2.48	0.236	20	4.6	7400	SE..1204
		Metric									
<b>SUPER CLOSE</b>	24504	R220.53-0063-12-9A	63	75	47	40	6	9	1.3	13200	SE..1204
	24503	R220.53-0080-12-11A	80	92	62	50	6	11	2.4	11700	SE..1204
	24505	R220.53-0100-12-12A	100	112	77	50	6	12	3.7	10500	SE..1204
	24717	R220.53-0125-12-14A	125	137	90	63	6	14	6.8	9400	SE..1204
	24737	R220.53-8160-12-17	160	172	130	63	6	17	11.7	8300	SE..1204
	24482	R220.53-8200-12-20	200	212	160	63	6	20	15.9	7400	SE..1204

For Cutting Data see page 45

### PRODUCT OVERVIEW

- Close-pitch design
- Patented center-locking-from-behind insert screws
- Additional inserts per cutter diameter
- High density cutter bodies
- Elimination of wedges or extra parts
- Comprehensive range of inserts
- General purpose

### RANGE OVERVIEW

- Diameters from 3.00" - 8.00" (63 mm to 200 mm) as standard
- Two or three additional inserts per cutter (depending on diameter)
- Positive cutting rakes/negative radial rakes for stable and unstable conditions
- Roughing and finishing for all material types

### YOUR SECO BENEFIT

- Increased productivity
- High performance, strength and reliability
- Ease of use
- Faster feed rates and superior surface finishes
- Wide range of material applicability
- Quick, precise and secure insert mounting

# MILLING TOOLING SYSTEMS



## CUTTER SYSTEM DELIVERS VERSILITY & STRENGTH

# COMBIMASTER™

Seco continues to enhance and expand its industry-leading Combimaster family with the addition of a larger connection size that brings the line's high stability and performance to diameter 1.500" (40 mm) milling cutters.

The Combimaster milling cutter system encompasses an array of shank types, lengths and interchangeable cutter heads that offers maximum flexibility over a wide range of applications. The extremely cost-effective system includes square shoulder and end mills, copy mills, face mills, plunge mills and disc mills.

### YOUR SECO BENEFIT

- Stability, increased reliability and longer tool life
- Higher achievable material removal rates
- Strength for larger depth-of-cut possibilities
- Increased speeds and feeds for a wider range of applications
- Easy transition from small to large size cutters
- Coolant-through incorporated into all holders and cutters
- Combimaster versatility and cost effectiveness

# NEW! COMBIMASTER M20

This new larger holder connection with the M20 thread advances Combimaster into the larger-diameter cutter arena. But most significantly, it delivers excellent stability and strength for high material removal rates. The M20 thread ensures the strongest connection possible between the shank and cutter body. In most instances, the Combimaster M20 allows users to increase both metal removal rates and depths of cut by as much as 15% to improve overall machining performance.

For the Combimaster range of products, Seco has adapted the M20 connection to over 30 new holder styles, as well as over 50 types of milling cutters. This includes the round and high-feed insert range of products. Other product areas also incorporate the new connection, such as the square shoulder, plunge, ballnose and aluminium milling cutter ranges.

## PRODUCT OVERVIEW

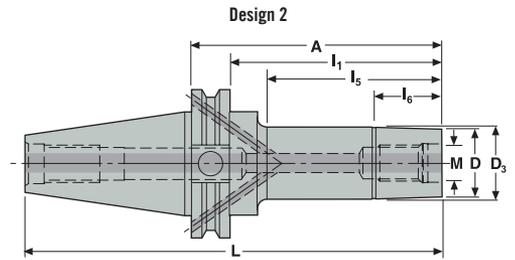
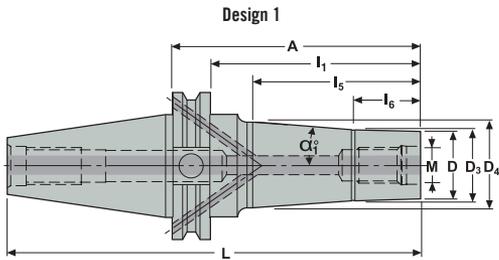
- Robust M20 connection easily transitions users from small to large diameter cutters
- M20 thread shank for maximum holding
- Greater assembly contact area for added strength
- Cutter body design eliminates large central holes, allowing use in a wider range of applications as compared with shell end cutters



## RANGE OVERVIEW

- M20 connection joins existing product range of M6, M8, M10, M12 and M16 thread sizes
- Initial M20 range applies to Seco Highfeed, plunge, square shoulder and copy milling cutters
- New 1.500" (40 mm)/M20 size available in conical reinforced shank designs 5820 and cylindrical/straight 5821
- M20 holders come in HSK A63/A100, BT40/50, ISO 40/50, CAT 40/50, and Seco-Capto C5/C6, as well as in Weldon, extensions and reductions
- All cutter styles have through-coolant capability (through center and body flanges)
- Wide range of available standard lengths

# MILLING TOOLING SYSTEMS

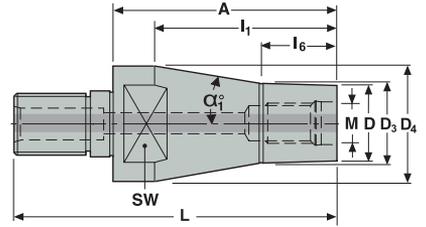


## NEW EPB 5820-5821 - ARBORS CAT & CAT B5.50-ADB

TAPER	CONNECTING THREAD SIZE (M)	EDP	DESCRIPTION	DIMENSIONS IN INCH									$\alpha_1^\circ$	DESIGN	BALANCING	LBS
				A	L	I <sub>1</sub>	I <sub>5</sub>	I <sub>6</sub>	D	D <sub>3</sub>	D <sub>4</sub>					
CAT40 ADB	M20	58093	E260258202040	1.57	4.27	0.82	0.78	0.20	1.44	1.48	1.48	5.7	1	1	2.0	
	M20	58101	E260258212085	3.35	6.04	2.59	2.44	0.79	1.44	1.46	-	-	2	1	2.6	
	M20	58102	E2602582120135	5.31	8.01	4.56	4.44	0.79	1.44	1.46	-	-	2	1	3.5	
CAT50 ADB	M20	58103	E260458202095	3.74	7.75	2.99	1.97	0.79	1.44	1.48	1.91	6.9	1	1	7.3	
	M20	58104	E2604582020145	5.71	9.72	4.96	3.94	1.18	1.44	1.48	2.15	4.1	1	1	8.6	
	M20	58105	E2604582020195	7.68	11.69	6.93	5.91	0.79	1.44	1.48	2.20	10.4	1	1	10.1	
HSK-A63	M20	47424	E930458202065	2.56	3.82	1.54	1.18	0.39	1.44	1.48	1.75	6.4	1	1	2.2	
	M20	10445	E9304582020110	4.33	5.59	3.31	2.95	0.98	1.44	1.48	1.75	6.5	1	1	3.1	
	M20	47425	E9304582120110	4.33	5.59	3.31	2.95	0.98	1.44	1.46	-	-	2	1	2.6	
HSK-A100	M20	47426	E930658202075	2.95	4.92	1.81	1.57	0.79	1.44	1.48	1.87	14.1	1	1	5.3	
	M20	06666	E9306582020135	5.31	7.28	4.17	3.94	1.18	1.44	1.48	2.15	6.9	1	1	6.8	
	M20	47428	E9306582120110	4.33	6.30	3.19	2.95	0.98	1.44	1.46	-	-	2	1	5.7	
BT40 ADB	M20	47429	E341458212045	1.77	4.35	0.71	0.39	0.20	1.44	1.46	-	-	2	1	2.4	
	M20	06670	E3414582020110	4.33	6.91	3.27	2.95	0.98	1.44	1.48	1.75	4	1	1	3.7	
	M20	47430	E341458212085	3.35	5.92	2.28	1.97	0.79	1.44	1.46	-	-	2	1	3.1	
BT50 ADB	M20	06688	E341658202095	3.74	7.75	2.24	1.97	0.79	1.44	1.48	1.91	10.4	1	1	8.8	
	M20	06689	E3416582020145	5.71	9.72	4.21	3.94	1.18	1.44	1.48	2.15	6.9	1	1	10.1	
	M20	47431	E3416582120110	4.33	8.34	2.83	2.56	0.98	1.44	1.46	-	-	2	1	9.0	
DIN40 ADB	M20	47432	E346958212045	1.77	4.46	1.02	0.79	0.39	1.44	1.46	-	-	2	1	2.2	
	M20	47433	E3469582020110	4.33	7.02	3.58	2.95	0.98	1.44	1.48	1.75	4	1	1	3.5	
	M20	47434	E346958212085	3.35	6.04	2.59	2.36	0.79	1.44	1.46	-	-	2	1	2.6	
DIN50 ADB	M20	47436	E347158202095	3.74	7.75	2.99	2.56	0.98	1.44	1.48	1.99	9.3	1	1	7.1	
	M20	47438	E3471582020145	5.71	9.71	4.96	4.53	0.79	1.44	1.48	2.07	6.9	1	1	8.8	
	M20	47440	E3471582120110	4.33	8.34	3.58	3.15	0.98	1.44	1.46	-	-	2	1	7.1	

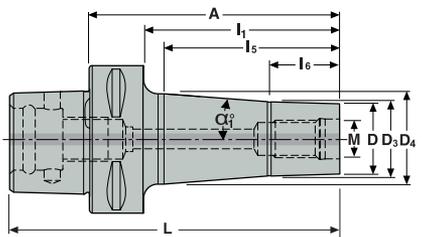
Please check availability in current price and stock-list.

# COMBIMASTER M20



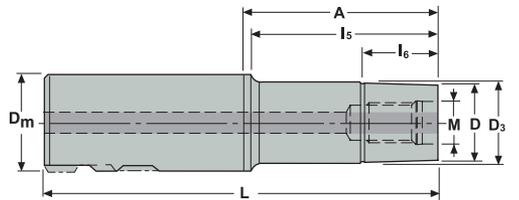
**NEW EPB BS/5820 - REDUCERS**

COMBIMASTER SHANK SIZE	CONNECTING THREAD SIZE (M)	EDP	DESCRIPTION	DIMENSIONS IN INCH								SW mm	a <sub>1</sub> °	BALANCING	LBS
				A	L	I <sub>1</sub>	I <sub>6</sub>	D	D <sub>3</sub>	D <sub>4</sub>	M				
M20	M20	06786	BS02058202045	1.77	2.83	-	-	1.44	-	-	32	-	2	0.7	



**NEW EPB 5820 - COMBIMASTER ADAPTERS, SECO-CAPTO/ ISO 26623-1**

SECO-CAPTO™ SHANK	CONNECTING THREAD SIZE	EDP	DESCRIPTION	DIMENSIONS IN INCH								a <sub>1</sub> °	BALANCING	LBS
				A	D	D <sub>3</sub>	D <sub>4</sub>	L	I <sub>1</sub>	I <sub>5</sub>	I <sub>6</sub>			
C5	M20	06869	C5-391.5820-20075	2.953	1.437	1.476	1.693	4.134	2.047	1.969	0.787	5.3	1	2.0
C6	M20	06883	C6-391.5820-20075	2.953	1.437	1.476	1.673	4.449	1.969	1.772	0.787	5.8	1	2.6

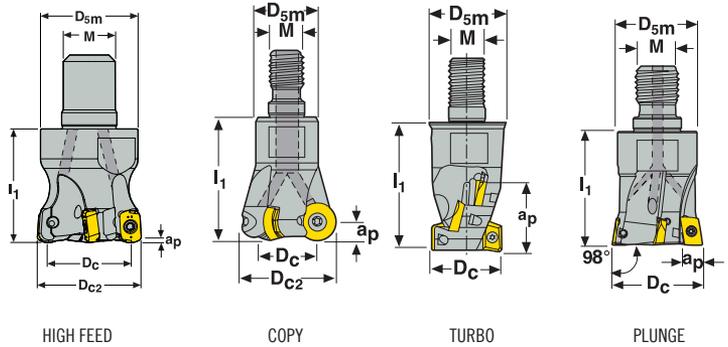


**NEW EPB BW/5821 - COMBIMASTER WELDON EXTENSIONS - DIN 1835-1 FORM B**

WELDON SHANK D <sub>m</sub>	CONNECTING THREAD SIZE	EDP	DESCRIPTION	DIMENSIONS IN INCH						DESIGN	BALANCING	LBS
				A	L	I <sub>5</sub>	I <sub>6</sub>	D	D <sub>3</sub>			
40	M20	47457	BW040582120102	102	172	97	30	36.5	37	2	2	3.3

Please check availability in current price and stock-list.

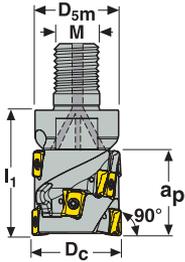
# MILLING TOOLING SYSTEMS



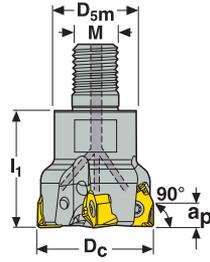
## NEW 2ORE CUTTERS - SLOTTING & CONTOURING - COMBIMASTER

STYLE	EDP	DESCRIPTION	DIMENSIONS IN INCH/METRIC							a° max		LB/KG	MAX RPM	INSERT
			Dc2	Dc	D5m	I1	M	ap						
HIGH FEED		Inch												
	52990	R217.21-01.50-20RE-L006.6A	1.50	1.30	1.44	1.57	M20	0.035	0.4	6	0.7	18000	LOH.06	
	05938	R217.21-01.50-20RE-LP06.7A	1.50	1.18	1.44	1.57	M20	0.031	0.9	7	0.7	24000	LP.06	
	05927	R217.21-01.50-20RE-R125.4A	1.50	0.98	1.44	1.60	M20	0.059	2.47	4	0.7	17600	218.19-125	
	05835	R217.21-01.50-20RE-R160.3HA	1.50	0.91	1.44	1.60	M20	0.079	2.18	3	0.7	14500	218.19-160	
		Metric												
	05735	R217.21-2040.RE-L006.6A	40	33	36.5	40	M20	0.9	0.4	6	0.4	18000	LO..06	
	06251	R217.21-2040.RE-LP06.7A	40	31.5	36.5	40	M20	0.8	0.9	7	0.4	24000	LP..06	
	06250	R217.21-2040.RE-R125.4A	40	29.25	36.5	40	M20	1	2.47	4	0.3	17600	218.19-125	
	06282	R217.21-2040.RE-R160.3HA	40	23.99	36.5	40	M20	1.8	2.18	3	0.3	14500	218.19-160	
COPY		Inch												
	52980	R217.29I-01.50-20RE-06.4A	1.50	1.03	1.44	1.57	M20	0.236	8.5	4	0.7	14000	RP..12	
		Metric												
	06098	R217.29-2040.RE-04.6A	40	32	36.5	40	M20	4	4.66	6	0.4	23300	RD..0803	
	06103	R217.29-2040.RE-05.5A	40	30	36.5	40	M20	5	6.81	5	0.3	19300	RD..10T3	
	06185	R217.29-2040.RE08.3A	40	24	36.5	45	M20	8	20	3	0.3	10900	RP..1605	
	05730	R217.29-2040.RE-10.2A	40	20	36.5	40	M20	10	40	2	0.3	8400	RP..2006	
	05726	R217.29-2042.RE-05.5A	42	32	36.5	40	M20	5	6.31	5	0.4	18800	RD..10T3	
	05727	R217.29-2042.RE-05.6A	42	32	36.5	40	M20	5	6.31	6	0.4	18800	RD..10T3	
		Metric												
06113	R217.29I-2040.RE06.4A	40	28	36.5	45	M20	6	8	4	0.4	14000	RP..1204		
05728	R217.29I-2042.RE-06.5A	42	30	36.5	45	M20	6	4.2	5	0.4	13600	RP..1204		
TURBO		Inch												
	54305	R217.69-01.50-20RE-01.30-12-3A	-	1.50	1.44	2.17	M20	1.299	2.5	9	0.9	16400	XO.X12	
	54303	R217.69-01.50-20RE-01.34-10-4A	-	1.50	1.44	1.97	M20	1.339	1.5	16	0.9	18600	XO.X10	
	54304	R217.69-01.50-20RE-01.34-10-5A	-	1.50	1.44	2.17	M20	1.339	1.5	20	0.9	18600	XO.X10	
	54306	R217.69-01.50-20RE-01.73-12-4A	-	1.50	1.44	2.17	M20	1.732	2.5	16	0.9	16400	XO.X12	
		Metric												
	47726	R217.69-2040.RE-033-12.3AN	-	40	36.5	50	M20	33	2.5	9	0.4	16400	XO.X12..	
	47724	R217.69-2040.RE-034-10.4A	-	40	36.5	55	M20	34	1.5	16	0.4	18600	XO.X10T3..	
	47725	R217.69-2040.RE-034-10.5A	-	40	36.5	55	M20	34	1.5	20	0.4	18600	XO.X10T3..	
	47759	R217.69-2040.RE-044-12.4AN	-	40	36.5	61	M20	44	2.5	16	0.4	16400	XO.X12..	
67934	R217.69-2040.RE-10-4A	-	40	36.5	40	M20	9	1.5	4	0.4	18600	XO.X10T3..		
67935	R217.69-2040.RE-10-6A	-	40	36.5	40	M20	9	1.5	6	0.4	18600	XO.X10T3..		
47698	R217.69-2040.RE-12-4AN	-	40	36.5	40	M20	11	2.5	4	0.4	16400	XO.X12..		
47699	R217.69-2040.RE-12-5AN	-	40	36.5	40	M20	11	2.5	5	0.4	16400	XO.X12..		
47701	R217.69-2040.RE-18-3AN	-	40	36.5	45	M20	17	4.5	3	0.4	9900	XO.X18..		
51442	R217.69-2040.RE-18-4AN	-	40	36.5	45	M20	17	4.5	4	0.4	9900	XO.X18..		
PLUNGE		Inch												
	05984	R217.79-01.50-20RE-10.5A	-	1.50	1.44	1.57	M20	0.236	-	5	0.9	150000	XO..10	
	06011	R217.79-01.50-20RE-XO12.3A	-	1.50	1.44	1.57	M20	0.276	-	3	0.9	16400	XO..12	
	06054	R217.79-01.50-20RE-XO12.4A	-	1.50	1.44	1.57	M20	0.276	-	4	0.9	16400	XO..12	
		Metric												
	06252	R217.79-2040.RE-10-5A	-	40	36.5	40	M20	6.0	-	5	0.4	150000	XO.X10T3	
06276	R217.79-2040.RE-XO12.3A	-	40	36.5	40	M20	7.0	-	3	0.4	16400	XO.X12		
06278	R217.79-2040.RE-XO12.4A	-	40	36.5	40	M20	7.0	-	4	0.4	16400	XO.X12		

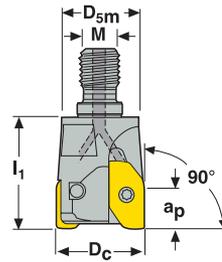
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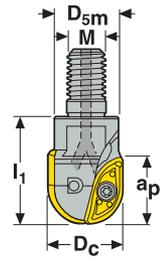
SQUARE T4



SQUARE 6



AERO MASTER



K2

## NEW 20RE CUTTERS - SLOTTING & CONTOURING - COMBIMASTER

STYLE	EDP	DESCRIPTION	DIMENSIONS IN INCH/METRIC							a° max		LB/KG	MAX RPM	INSERT
			D <sub>c2</sub>	D <sub>c</sub>	D <sub>5m</sub>	I <sub>1</sub>	M	a <sub>p</sub>						
SQUARE T4	Inch													
	54307	R217.94-01.50-20RE-01.42-08-3A	-	1.50	1.44	2.17	M20	1.417	-	15	0.9	16400	LOEX08	
	54308	R217.94-01.50-20RE-01.69-08-4A	-	1.50	1.44	2.36	M20	1.693	-	24	0.9	16400	LOEX08	
	29126	R217.94-01.50-20RE-12-3A	-	1.50	1.44	1.57	M20	0.472	-	3	0.9	16400	LOEX12	
	29127	R217.94-01.50-20RE-12-4A	-	1.50	1.44	1.57	M20	0.472	-	4	0.9	16400	LOEX12	
	Metric													
	47768	R217.94-2040.RE-036-08.3A	-	40	36.5	55	M20	36	-	15	0.4	16400	LOEX08..	
	47788	R217.94-2040.RE-043-08.4A	-	40	36.5	60	M20	43	-	20	0.45	16400	LOEX08..	
	47722	R217.94-2040.RE-08-4A	-	40	36	40	M20	8	-	4	0.4	14600	LOEX08..	
	47723	R217.94-2040.RE-08-6A	-	40	36	40	M20	8	-	6	0.4	14600	LOEX08..	
28975	R217.94-2040.RE-12-3A	-	40	36	40	M20	12	-	3	0.4	9900	LOEX12		
28976	R217.94-2040.RE-12-5A	-	40	36	40	M20	12	-	5	0.5	9900	LOEX12		
SQUARE 6™	Inch													
	68253	R217.96-01.50-20RE-04-6A	-	1.50	1.42	1.57	M20	0.157	-	6	0.2	20700	XNEX04	
	68254	R217.96-01.50-20RE-04-7A	-	1.50	1.42	1.57	M20	0.157	-	7	0.2	20700	XNEX04	
	Metric													
	67840	R217.96-2040.RE-04-6A	-	40	37	40	M20	4	-	6	0.4	20700	XNEX04..	
	67839	R217.96-2040.RE-04-7A	-	40	37	40	M20	4	-	7	0.4	20700	XNEX04..	
AERO MASTER	Inch													
	47720	R217.96-2040.RE-08-3A	-	40	36.5	40	M20	7.5	-	3	0.4	11800	XNEX08..	
	47721	R217.96-2040.RE-08-4A	-	40	36.5	40	M20	7.5	-	4	0.4	11800	XNEX08..	
	Inch													
	05733	R217.97-01.50-20RE-12.3A	-	1.50	1.44	1.57	M20	0.295	6	3	0.7	35000	XP..12	
	05729	R217.97-01.50-20RE-V22.2A	-	1.50	1.44	1.77	M20	0.394	10	2	0.7	35000	VP..22	
K2	Metric													
	06067	R217.97-2040.RE-V22.2A	-	40	36.5	45	M20	10	10	2	0.3	35000	VPGX2206	
K2	Inch													
	06097	R217.97-2040.RE-X12.3A	-	40	36.5	40	M20	7.5	6	3	0.3	35000	XP..12	
	05787	R218.20-01.50-20RE-34A	-	1.50	1.44	2.17	M20	1.339	-	2	0.7	7200	218.20-0.750R	
K2	Metric													
	06192	R218.20-2040.RE-35A	-	40	36.5	54.9	M20	35	-	2	0.3	7200	218.20200R	
06207	R218.20-2050.RE-44A	-	50	36.5	64.87	M20	44	-	2	0.4	5000	218.20250R		

Please check availability in current price and stock-list.



## NEW SOLUTIONS FOR PRECISION MACHINING

# PCBN HARD PART TURNING GRADES

Seco demonstrates significant advancements in hard part turning operations with its latest PCBN grades. Consisting of three grades, the lineup joins the existing CBN060K to complete the premium offering for precision machining of hardened steel workpiece materials.

From continuous cuts to heavy interruptions, these grades feature a new substrate concept that maximizes their toughness and wear resistance. As such, they are able to provide exceptional tool life and high surface quality in ISO H05 to H35 applications, even at high cutting speeds.

**NEW! CH0550 GRADE FOR ISO H05:** Developed to resist abrasion and high temperatures, the grade combines a new nanolaminate coating and new substrate to achieve high-speed, continuous cuts in applications with high surface finish requirements.

**EXISTING CBN060K FOR ISO H15:** Well-known grade for continuous and/or medium interrupted cuts.

**NEW! CH2540 GRADE FOR ISO H25:** A new substrate and well-proven coating allows the grade to provide high wear resistance and toughness in applications that consist of continuous cuts and heavy interruptions.

**NEW! CH3515 GRADE FOR ISO H35:** A new substrate and well-proven coating allows the grade to offer unmatched toughness in heavy interrupted cuts.

## PRODUCT OVERVIEW

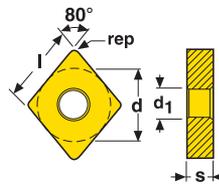
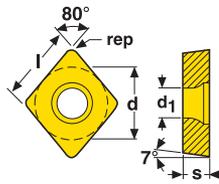
- PCBN insert grades optimize hardened steel turning operations
- New bimodal grain size substrate with coarser grains maximizes grade toughness and wear resistance
- Grades achieve high productivity and long tool life in various machining conditions

## YOUR SECO BENEFIT

- Total hard turning solutions
- Long tool life
- Excellent surface finishes
- High process stability
- Unmatched productivity

## RANGE OVERVIEW

- Available in common ISO insert geometries, with and without wipers
- CH2540 for ISO H25, CH3515 for ISO H35



## NEW PCBN GRADES - CCGW & CNGA

DESCRIPTION	GRADES (EDP)			
	COATED			
	CBN060K	CH0550	CH2540	CH3515
Tolerances: I.C. = ±0.001 s = ±0.005 rep = ±0.004				

DESCRIPTION	GRADES (EDP)			
	COATED			
	CBN060K	CH0550	CH2540	CH3515
Tolerances: I.C. = ±0.001 s = ±0.005 rep = ±0.004				



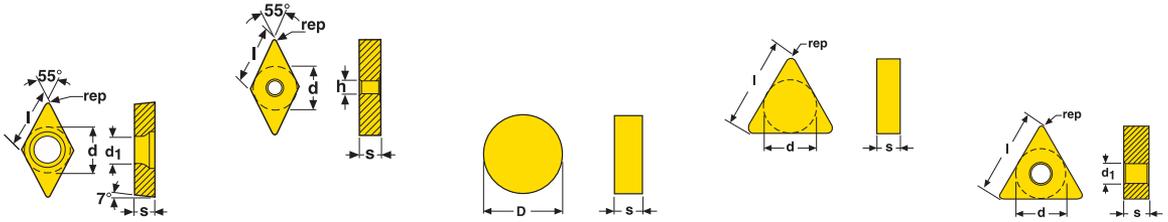
CCGW 21.51E-L1-B	68933	-	-	-
CCGW 21.51S-00625-L1-B	62791	57537	-	-
CCGW 21.52S-00625-L1-B	-	-	56557	-
CCGW 21.52S-L1-WZP-B	81786	-	-	-
CCGW 32.51E-L1-B	68934	-	-	-
CCGW 32.52E-L1-B	68936	-	-	-
CCGW 32.51S-00625-L1-B	54025	57546	-	-
CCGW 32.52S-00625-L1-B	62790	57564	56558	-
CCGW 32.51S-00625-L1-WZ-B	68935	57555	-	-
CCGW 32.52S-00625-L1-WZ-B	68937	-	-	-
CCGW 32.51S-L1-WZP-B	81790	57548	-	-
CCGW 32.52S-L1-WZP-B	81787	-	-	-

CNGA 431S-00625-L1-B	-	57487	-	-
CNGA 432S-00415-L1-B	-	57490	-	-
CNGA 432S-00625-L1-B	45198	59226	56559	-
CNGA 433S-00415-L1-B	-	57534	-	-
CNGA 433S-00625-L1-B	45207	57535	56560	-
CNGA 433S-00820-L1-B	-	-	-	60326
CNGA 431S-00625-L1-U	68938	-	-	-
CNGA 432S-00625-L1-U	62792	-	-	-
CNGA 433S-00625-L1-U	62793	-	-	-
CNGA 432S-00625-L1-WZ-B	45209	57489	57984	-
CNGA 433S-00625-L1-WZ-B	-	-	56561	-
CNGA 432S-00625-L1-WZ-U	62794	-	-	-
CNGA 433S-00625-L1-WZ-U	62797	-	-	-
CNGA 432S-L1-WZN-B	54026	-	-	-
CNGA 432S-00625-L1-WZP-B	54027	57488	-	-
CNGA 432S-L1-WZN-U	62796	-	-	-

For Cutting Data see page 48

INSERT	SIZE	DIMENSIONS IN INCH					
		d (I.C.)	D	s	l	d <sub>1</sub>	rep
CCGW	21.5	1/4	-	3/32	0.256	0.114	1/128-1/32
CCGW	32.5	3/8	-	5/32	0.382	0.177	1/64-1/32
CCGW	43	1/2	-	3/16	0.508	0.220	1/64-1/32
CNGA					0.508	0.203	
CNGA	43	1/2	-	3/16	0.508	0.203	1/64-3/64

# PCBN HARD PART TURNING GRADES



## NEW PCBN GRADES - DCGW, DNGA, RNGN, TNGA

Tolerances: I.C. = ±0.001 s = ±0.005 rep = ±0.004	GRADES (EDP)			
	COATED			
	CBN060K	CH0550	CH2540	CH3515
DESCRIPTION				

Tolerances: I.C. = ±0.001 s = ±0.005 rep = ±0.004	GRADES (EDP)			
	COATED			
	CBN060K	CH0550	CH2540	CH3515
DESCRIPTION				

### DCGW...-B



DCGW 21.50.5S-00625-L1-B	-	-	57965	-
DCGW 21.51S-00625-L1-B	-	-	57967	-
DCGW 21.52S-00625-L1-B	-	-	56566	-
DCGW 32.51S-00625-L1-B	54028	56537	-	-
DCGW 32.52S-00625-L1-B	54029	56540	-	-

### DNGA...-B



### DNGA...-U



DNGA 432S-00625-L1-B	54030	57289	56567	-
DNGA 432S-00625-L1-WZ-B	-	57310	-	-
DNGA 433S-00625-L1-B	-	-	56570	-
DNGA 432S-00625-L1-U	62798	-	-	-
DNGA 441S-00625-L1-B	-	57288	-	-
DNGA 442S-L1-WZP-B	-	57311	-	-
DNGA 442S-00625-L1-B	54031	57319	57985	-
DNGA 443S-00625-L1-B	-	-	57995	-
DNGA 441S-00625-L1-U	68939	-	-	-
DNGA 442S-00625-L1-U	62799	-	-	-
DNGA 443S-00625-L1-U	62800	-	-	-

### RNGN



### RNGN-LF



RNGN 22S-00625	54032	57320	58013	-
RNGN 32S-00625	54033	57321	56571	-
RNGN 22S-00820-LF	-	-	-	60327

### TCGW...-C



TCGW 21.51E-L1-C	68940	-	-	-
TCGW 21.51S-00625-L1-C	54034	-	-	-
TCGW 21.52S-00625-L1-C	54035	56944	56576	-

### TNGA...-C



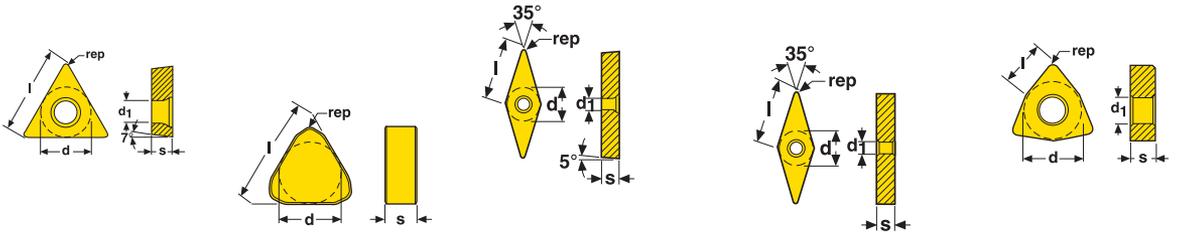
### TNGA...-V



TNGA 332S-00625-L1-C	-	57473	58021	-
TNGA 334S-00240-L1-C	-	-	-	60328
TNGA 335S-00240-L1-C	-	-	-	60330
TNGA 332S-00625-L1-V	62801	-	-	-

INSERT	SIZE	DIMENSIONS IN INCH					
		d (I.C.)	D	s	l	d <sub>1</sub>	rep
DCGW	21.5	1/4	-	3/32	0.307	0.114	1/128-1/32
DCGW	32.5	3/8	-	5/32	0.457	0.177	1/128-1/32
DNGA					0.591	0.203	
DNGA	43	1/2	-	3/16	0.591	0.203	1/64-3/64
DNGA	44	1/2	-	1/4	0.591	0.203	1/64-3/64
RNGN-LF	22	1/4	-	1/8	-	-	-
RNGN-LF	32	3/8	-	1/8	-	-	-
RNGN-LF	42	1/2	-	1/8	-	-	-
RNGN-LF	43	1/2	-	3/16	-	-	-
TCGW	1.81	7/32	-	3/32	0.354	0.102	1/64
TCGW	21.5	1/4	-	3/32	0.433	0.114	1/64-1/32
TNGA				0.650	0.150		
TNGA	33	3/8	3/16	0.650	0.150	1/64-3/64	

# PCBN HARD PART TURNING GRADES



## NEW PCBN GRADES - TNGN, TNGX, VBGW, VNGA, WNGA

Tolerances: I.C. = ±0.001 s = ±0.005 rep = ±0.004	GRADES (EDP)			
	COATED			
	CBN060K	CH0550	CH2540	CH3515
DESCRIPTION				

### TNGN



TNGN 221S-00625	68941	57362	-	-
TNGN 222S-00625	45210	57384	58025	-
TNGN 223S-00625	45211	57456	58026	-

### TNGX...-WZ



TNGX 222S-00625-WZ	45212	57329	-	-
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### VBGW

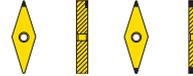


VBGW 332E-L1-B	71743	-	-	-
VBGW 330.5S-00625-L1-B	-	-	56586	-
VBGW 331S-00625-L1-B	68942	57287	57968	-
VBGW 332S-00625-L1-B	68943	-	56596	-

Tolerances: I.C. = ±0.001 s = ±0.005 rep = ±0.004	GRADES (EDP)			
	COATED			
	CBN060K	CH0550	CH2540	CH3515
DESCRIPTION				

### VNGA

### VNGA...-U



VNGA 330.5S-00625-L1-B	-	-	58030	-
VNGA 331S-00625-L1-B	-	-	58031	-
VNGA 332S-00625-L1-B	-	-	56620	-
VNGA 331S-00625-L1-U	71600	-	-	-
VNGA 332S-00625-L1-U	68944	-	-	-

### WNGA

### WNGA...-C

### WNGA...-V



WNGA 332S-00625-WZ	68945	-	-	-
WNGA 432S-00625-L1-C	-	-	58028	-
WNGA 432S-00625-L1-V	62802	-	-	-
WNGA 433S-00625-L1-V	62803	-	-	-
WNGA 432S-00625-L1-WZ-C	-	57474	58029	-
WNGA 432S-00625-L1WZV	71597	-	-	-
WNGA 433S-00625-L1-WZ-V	68946	-	-	-

For Cutting Data see page 48

INSERT	SIZE	DIMENSIONS IN INCH					
		d (I.C.)	D	s	l	d <sub>1</sub>	rep
TNGN	22	1/4	-	1/8	0.433	-	1/64-3/64
TNGN	32	3/8	-	1/8	0.650	-	1/64
TNGX	22	1/4	-	1/8	0.433	-	1/32
VBGW	33	3/8	-	3/16	0.630	0.177	1/128-1/32
VNGA	33	3/8	-	3/16	0.630	0.150	1/128-1/32
WNGA	33	3/8	-	3/16	0.260	0.150	1/32
WNGA	43	1/2	-	3/16	0.343	0.203	1/32-3/64

# TURNING GRADES



## FINISHING TURNING GRADE FOR EXOTIC MATERIALS

# TS2050

Seco continues to provide high performance turning grades to cover your medical component applications. This TS2050 grade is a first choice medical component semi-finishing and finishing applications. Hip parts in CoCr-alloys are efficiently and safely machined by the TS2050 inserts. TS2050 is also a high-performance alternative in TMZF and many titanium alloys.

This TS2050 grade has two chipbreaker offerings. The AL chipbreaker is for general use in smaller-sized medical components. Some of the major advantages of the TS2050 inserts are, extremely light-cutting design, resistance to edge build-up longer tool life. The F1 chipbreaker is well known and suited for larger diameter components and reliable edge toughness and better chip control.

### PRODUCT OVERVIEW

- Finish-turning grade for exotic materials, ISO-S
- Proven high performance in medical parts
- Excels in CoCr-alloys

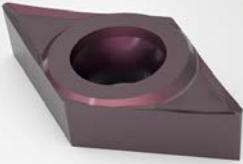
### RANGE OVERVIEW

- Proven nanolaminate TiAlSiN coating
- AL & F1 Chipbreaker designs

### YOUR SECO BENEFIT

- Very hard, superfine submicron grade
- Highly wear resistant for ISO S materials
- Enhanced edge toughness for improved chippage resistance
- Provides best balance between reliability and productivity requirements

# TURNING GRADES



## NEW MEDICAL TS2050

Tolerances:  $d = \pm 0.001$   $s = \pm 0.002$   
 $r_e = (\geq 1/128) = \pm 0.004$   
 $r_e = (\leq 1/256) = \pm 0.001$

**GRADES  
(EDP)**

**COATED**

**DESCRIPTION**

**TS2050**

### DCGT-AL



DCGT32.50.5F-AL	13933
DCGT32.51F-AL	13931

### DCGT-F1



DCGT32.51-F1	13924
DCGT32.52-F1	13925

### VBGT-F1

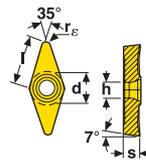
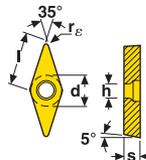
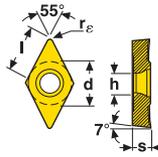


VBGT331-F1	13928
VBGT332-F1	13929

### VCGT-AL



VCGT330.5F-AL	13934
VCGT331F-AL	13936



Size	Dimensions in inch				
	d (I.C.)	s	l	h	r <sub>e</sub>
0702	1/4	3/32	0.307	0.114	0.002-0.016
11T3	3/8	5/32	0.457	0.173	0.004-0.031
11T3	3/8	5/32	0.457	0.177	0.004-0.031
15	1/2	3/16	0.610	0.220	0.016
21.5	1/4	3/32	0.305	0.110	0.002-0.016
21.5	1/4	3/32	0.307	0.110	0.002-0.016
21.5	1/4	3/32	0.307	0.114	0.002-0.016
32.5	3/8	5/32	0.457	0.173	0.004-0.031
32.5	3/8	5/32	0.457	0.177	0.004-0.031

Size	Dimensions in inch				
	d (I.C.)	s	l	h	r <sub>e</sub>
21.5	1/4	3/32	0.433	0.114	0.004
33	3/8	3/16	0.630	0.177	0.004-0.031

Size	Dimensions in inch				
	d (I.C.)	s	l	h	r <sub>e</sub>
22	1/4	1/8	0.437	0.110	0.008-0.016
33	3/8	3/16	0.654	0.173	0.008-0.047

# SOLID END MILLING

## NIAGARA CUTTER™ HIGH FEED MACHINING SN200R, 400R, 500R

Niagara Cutter has been the leader in solid carbide milling and is now expanding its range of end mills for high feed milling and select plunge milling applications.

Niagara's new SN200R, SN400R and SN500R series of end mills completes the family of high feed tools by offering a complete range of 2-, 4- and 5-flutes end mills to cover a broad range of applications and materials. Available in 3, 5 and 7 times diameter of reach. These end mills also feature a defined radius ( $r_p$ ) which helps direct radial cutting pressure axially up into the tool holder and spindle. This feature allows for increased metal removal rates in deep pockets and long reach applications.

These end mills also feature an AlTiN coating that offers high heat resistance and superior abrasion resistance to maximize tool life.

### PRODUCT OVERVIEW

- Solid-carbide high feed tools excel in face, slot and plunge milling
- High feed capabilities yield significant productivity gains
- Reduced production costs when processing deep and shallow pockets
- Longer tool life than previous cutters when applied at the same table feed rates
- Low radial forces minimize vibration and machine wear
- Wide application area covered, from steel to exotic materials
- SN200R (2-flutes) high feed series, 3, 5 and 7 x Diameter of reach, Diameters range from (0.063" - 0.500"), cylindrical shank, defined radius ( $r_p$ )
- SN400R (4-flutes) high feed series, 3, 5 and 7 x Diameter of reach, Diameters range from (0.125" - 0.500"), cylindrical shank, defined radius ( $r_p$ )
- SN500R (5-flutes) high feed series, 3 x Diameter of reach, Diameters range from (0.375" - 0.500"), cylindrical shank, defined radius ( $r_p$ )

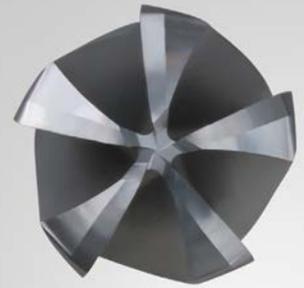


## YOUR NIAGARA CUTTER BENEFIT

- Multiple flutes
- Long tool overhang
- Axial directed cutting forces
- High heat and abrasion resistant
- Reduced cycle time, higher metal removal rates
- Deep cavity milling
- Provides smoother cutting in long reach applications
- Long and predictable tool life

## RANGE OVERVIEW

- 2-, 4- and 5-flute end mill diameters from 1/16"-1/2" diameter
- 3xD, 5xD and 7xD length versions available



SN500R

## NEW NIAGARA CUTTER SN200R, 400R, 500R



EDP	DESCRIPTION	METRIC CROSS	FLUTE DIA	SHANK DIA	LOC $a_p$	OAL	RADIUS $r_p^*$	NECK DIA	REACH LENGTH	SHANK LENGTH	FLUTES	COATING
N13984	SN200R-0.063-G1-H007.0-Z2	1.5	1/16	1/4	0.004	2	0.0074	0.055	0.188	1.813	2	AITIN
N13985	SN200R-0.063-G2-H007.0-Z2	1.5	1/16	1/4	0.004	2	0.0074	0.055	0.313	1.688	2	AITIN
N13986	SN200R-0.063-J3-H007.0-Z2	1.5	1/16	1/4	0.004	2	0.0074	0.055	0.438	1.563	2	AITIN
N13987	SN200R-0.094-G1-H011.0-Z2	2.0	3/32	1/4	0.006	2	0.0111	0.082	0.281	1.719	2	AITIN
N13988	SN200R-0.094-G2-H011.0-Z2	2.0	3/32	1/4	0.006	2	0.0111	0.082	0.469	1.531	2	AITIN
N13989	SN200R-0.094-J3-H011.0-Z2	2.0	3/32	1/4	0.006	2-1/2	0.0111	0.082	0.656	1.844	2	AITIN
N13992	SN200R-0.125-G1-H015.0-Z2	3.0	1/8	1/4	0.008	2	0.0148	0.109	0.375	1.625	2	AITIN
N13993	SN200R-0.125-G2-H015.0-Z2	3.0	1/8	1/4	0.008	2-1/2	0.0148	0.109	0.625	1.875	2	AITIN
N13994	SN200R-0.125-J3-H015.0-Z2	3.0	1/8	1/4	0.008	2-1/2	0.0148	0.109	0.875	1.625	2	AITIN
N13995	SN400R-0.125-G1-H015.0-Z4	3.0	1/8	1/4	0.008	2	0.0148	0.109	0.375	1.625	4	AITIN
N13996	SN400R-0.125-G2-H015.0-Z4	3.0	1/8	1/4	0.008	2-1/2	0.0148	0.109	0.625	1.875	4	AITIN
N13997	SN200R-0.156-G1-H020.0-Z2	4.0	5/32	1/4	0.010	2	0.0200	0.136	0.469	1.531	2	AITIN
N13998	SN200R-0.156-G2-H020.0-Z2	4.0	5/32	1/4	0.010	2-1/2	0.0200	0.136	0.781	1.719	2	AITIN
N13999	SN200R-0.156-J3-H020.0-Z2	4.0	5/32	1/4	0.010	2-1/2	0.0200	0.136	1.094	1.406	2	AITIN
N14002	SN400R-0.156-G1-H020.0-Z4	4.0	5/32	1/4	0.010	2	0.0200	0.136	0.469	1.531	4	AITIN
N14003	SN400R-0.156-G2-H020.0-Z4	4.0	5/32	1/4	0.010	2-1/2	0.0200	0.136	0.781	1.719	4	AITIN
N14004	SN200R-0.188-G1-H023.0-Z2	5.0	3/16	1/4	0.012	2	0.0230	0.166	0.562	1.438	2	AITIN
N14005	SN200R-0.188-G2-H023.0-Z2	5.0	3/16	1/4	0.012	2-1/2	0.0230	0.166	0.937	1.563	2	AITIN
N14006	SN200R-0.188-J3-H023.0-Z2	5.0	3/16	1/4	0.012	3	0.0230	0.166	1.313	1.688	2	AITIN
N14007	SN400R-0.188-G1-H023.0-Z4	5.0	3/16	1/4	0.012	2	0.0230	0.166	0.562	1.438	4	AITIN
N14008	SN400R-0.188-G2-H023.0-Z4	5.0	3/16	1/4	0.012	2-1/2	0.0230	0.166	0.937	1.563	4	AITIN
N14009	SN200R-0.250-E1-H032.0-Z2	6.0	1/4	1/4	0.014	2-1/2	0.0322	0.218	0.750	1.750	2	AITIN
N14012	SN200R-0.250-E2-H032.0-Z2	6.0	1/4	1/4	0.014	3	0.0322	0.218	1.250	1.750	2	AITIN
N14013	SN200R-0.250-J3-H032.0-Z2	6.0	1/4	1/4	0.014	3-1/2	0.0322	0.218	1.750	1.750	2	AITIN
N14014	SN400R-0.250-E1-H032.0-Z4	6.0	1/4	1/4	0.014	2-1/2	0.0322	0.218	0.750	1.750	4	AITIN
N14015	SN400R-0.250-E2-H032.0-Z4	6.0	1/4	1/4	0.014	3	0.0322	0.218	1.250	1.750	4	AITIN
N14016	SN200R-0.313-G1-H037.0-Z2	8.0	5/16	3/8	0.016	2-1/2	0.0373	0.273	0.938	1.563	2	AITIN
N14017	SN200R-0.313-G2-H037.0-Z2	8.0	5/16	3/8	0.016	3-1/2	0.0373	0.273	1.563	1.938	2	AITIN
N14018	SN200R-0.313-J3-H037.0-Z2	8.0	5/16	3/8	0.016	4	0.0373	0.273	2.188	1.813	2	AITIN
N14019	SN400R-0.313-G1-H037.0-Z4	8.0	5/16	3/8	0.016	2-1/2	0.0373	0.273	0.938	1.563	4	AITIN
N14022	SN400R-0.313-G2-H037.0-Z4	8.0	5/16	3/8	0.016	3-1/2	0.0373	0.273	1.563	1.938	4	AITIN
N14023	SN200R-0.375-E1-H043.0-Z2	10.0	3/8	3/8	0.018	3	0.0432	0.329	1.125	1.875	2	AITIN
N14024	SN200R-0.375-E2-H043.0-Z2	10.0	3/8	3/8	0.018	3-1/2	0.0432	0.329	1.875	1.625	2	AITIN
N14025	SN200R-0.375-J3-H043.0-Z2	10.0	3/8	3/8	0.018	4-1/2	0.0432	0.329	2.625	1.875	2	AITIN
N14026	SN400R-0.375-E1-H043.0-Z4	10.0	3/8	3/8	0.018	3	0.0432	0.329	1.125	1.875	4	AITIN
N14027	SN500R-0.375-E1-H043.0-Z5	10.0	3/8	3/8	0.018	3	0.0432	0.329	1.125	1.875	5	AITIN
N14028	SN400R-0.375-E2-H043.0-Z4	10.0	3/8	3/8	0.018	3-1/2	0.0432	0.329	1.875	1.625	4	AITIN
N14029	SN200R-0.500-E1-H061.0-Z2	12.0	1/2	1/2	0.020	3-1/2	0.0614	0.444	1.500	2.000	2	AITIN
N14032	SN200R-0.500-E2-H061.0-Z2	12.0	1/2	1/2	0.020	4-1/2	0.0614	0.444	2.500	2.000	2	AITIN
N14033	SN200R-0.500-J3-H061.0-Z2	12.0	1/2	1/2	0.020	6	0.0614	0.444	3.500	2.500	2	AITIN
N14034	SN400R-0.500-E1-H061.0-Z4	12.0	1/2	1/2	0.020	3-1/2	0.0614	0.444	1.500	2.000	4	AITIN
N14035	SN500R-0.500-E1-H061.0-Z5	12.0	1/2	1/2	0.020	3-1/2	0.0614	0.444	1.500	2.000	5	AITIN
N14036	SN400R-0.500-E2-H061.0-Z4	12.0	1/2	1/2	0.020	4-1/2	0.0614	0.444	2.500	2.000	4	AITIN

For Cutting Data see pages 49-53

$r_p^*$  = Programmable radius

# SOLID END MILLING



## SMALLER NECK DIAMETERS INCREASE APPLICATION RANGE

# JABRO<sup>®</sup>-SOLID<sup>2</sup> JS554

The Jabro JS554 range of solid-carbide end mills gains further utility and versatility with smaller neck diameter options. These latest tools provide greater clearance when machining complex components such as those found in aerospace, medical and general machining applications.

Smaller neck dimensions make it easier to access parts clamped in complicated fixturing arrangements, as well as enable users to take full advantage of 4-axis and 5-axis machining capabilities.

The neck sizes are optimized to retain tool rigidity while providing full compatibility with standard toolholder connective systems. The tools maintain their ability to productively machine materials in the ISO P, M, S and other material groups.

JS554 end mills provide high stability and low deflection. They also bring an excellent price-performance ratio to a range of applications, and these latest additions further expand the line's advanced capabilities.

### PRODUCT OVERVIEW

- Smaller neck diameters ( $d_n$ ) provide high machining clearance
- Easy access to parts clamped in complicated fixturing arrangements
- Highly productive full 4-axis and 5-axis machining possible
- Optimized neck sizes retain rigidity and toolholder compatibility

### RANGE OVERVIEW

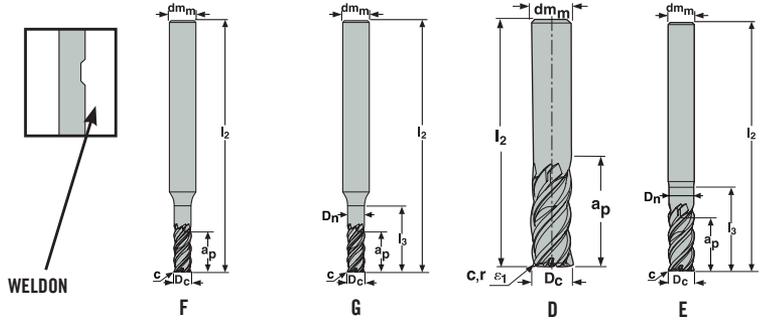
- Tool diameters from 3 mm - 20 mm
- Typical cutting lengths  $2xD + 2$  mm
- Reach length  $3xD_c$
- Corner radius and 45° chamfer versions
- Cylindrical and Weldon shanks

### YOUR SECO BENEFIT

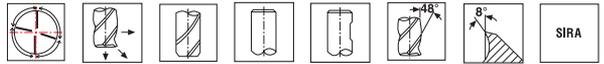
- Increased application range
- Greater machining clearance
- Full multi-axis machine capabilities
- High stability and low deflection
- Excellent price-performance ratio



# JABRO® SOLID<sup>2</sup> JS554



**NEW JS554 - SOLID CARBIDE END MILL -  
CYLINDRICAL - FOUR FLUTE - 45° CHAMFER -  
UNEQUAL FLUTE SPACING - OD REDUCTION**

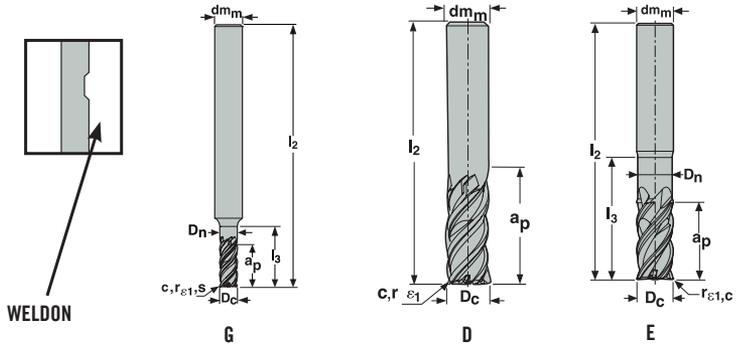


EDP	DESCRIPTION	LENGTH INDEX	TOOL SHAPE	DIMENSIONS IN MM						c x 45°	Z <sub>n</sub>	CYLINDRICAL	WELDON
				D <sub>c</sub>	dm <sub>m</sub>	a <sub>p</sub>	l <sub>2</sub>	l <sub>3</sub>	D <sub>n</sub>				
58171	JS554030G2C.0Z4-SIRA	2	G	3	6	8	57	10	2.85	0.035	4	■	
58172	JS554040G2C.0Z4-SIRA	2	G	4	6	10	57	13	3.8	0.045	4	■	
58174	JS554050G2C.0Z4-SIRA	2	G	5	6	12	57	16	4.75	0.055	4	■	
58176	JS554060E2C.0Z4-SIRA	2	E	6	6	14	57	18	5.7	0.075	4	■	
58178	JS554080E2C.0Z4-SIRA	2	E	8	8	18	63	25	7.6	0.1	4	■	
58180	JS554100E2C.0Z4-SIRA	2	E	10	10	22	72	29	9.5	0.125	4	■	
58183	JS554120E2C.0Z4-SIRA	2	E	12	12	26	83	35	11.4	0.15	4	■	
58186	JS554160E2C.0Z4-SIRA	2	E	16	16	34	92	42	15.2	0.2	4	■	
58191	JS554200E2C.0Z4-SIRA	2	E	20	20	42	109	54	19	0.25	4	■	
58192	JS554030G2C.3Z4-SIRA	2	G	3	6	8	57	10	2.85	0.035	4	■	■
58193	JS554040G2C.3Z4-SIRA	2	G	4	6	10	57	13	3.8	0.045	4	■	■
58195	JS554050G2C.3Z4-SIRA	2	G	5	6	12	57	16	4.75	0.055	4	■	■
58196	JS554060E2C.3Z4-SIRA	2	E	6	6	14	57	18	5.7	0.075	4	■	■
58198	JS554080E2C.3Z4-SIRA	2	E	8	8	18	63	25	7.6	0.1	4	■	■
58202	JS554100E2C.3Z4-SIRA	2	E	10	10	22	72	29	9.5	0.125	4	■	■
58207	JS554120E2C.3Z4-SIRA	2	E	12	12	26	83	35	11.4	0.15	4	■	■
58210	JS554160E2C.3Z4-SIRA	2	E	16	16	34	92	42	15.2	0.2	4	■	■
58214	JS554200E2C.3Z4-SIRA	2	E	20	20	42	109	54	19	0.25	4	■	■

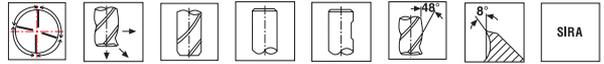
Tolerances: dm<sub>m</sub>=h5 D<sub>c</sub>=e7 c x 45° ■ Stock standard. Subject to change refer to current price-and stock-list.

For Cutting Data see pages 54-55

# JABRO® SOLID<sup>2</sup> JS554



**NEW JS554 - SOLID CARBIDE END MILL -  
- CYLINDRICAL - FOUR FLUTE - CORNER RADIUS -  
UNEQUAL FLUTE SPACING - OD-REDUCTION**



EDP	DESCRIPTION	LENGTH INDEX	TOOL SHAPE	DIMENSIONS IN MM								z <sub>n</sub>	CYLINDRICAL	WELDON
				D <sub>c</sub>	dm <sub>m</sub>	a <sub>p</sub>	l <sub>2</sub>	l <sub>3</sub>	D <sub>n</sub>	r <sub>c1</sub>	r <sub>c2</sub>			
58177	JS554060E2R020.0Z4-SIRA	2	E	6	6	14	57	18	5.7	0.2	4	■	■	
58156	JS554060E2R100.0Z4-SIRA	2	E	6	6	14	57	18	5.7	1	4	■	■	
58179	JS554080E2R050.0Z4-SIRA	2	E	8	8	18	63	25	7.6	0.5	4	■	■	
58181	JS554100E2R050.0Z4-SIRA	2	E	10	10	22	72	29	9.5	0.5	4	■	■	
58182	JS554100E2R100.0Z4-SIRA	2	E	10	10	22	72	29	9.5	1	4	■	■	
58157	JS554100E2R250.0Z4-SIRA	2	E	10	10	22	72	29	9.5	2.5	4	■	■	
58184	JS554120E2R050.0Z4-SIRA	2	E	12	12	26	83	35	11.4	0.5	4	■	■	
58185	JS554120E2R100.0Z4-SIRA	2	E	12	12	26	83	35	11.4	1	4	■	■	
58159	JS554120E2R300.0Z4-SIRA	2	E	12	12	26	83	35	11.4	3	4	■	■	
58190	JS554160E2R050.0Z4-SIRA	2	E	16	16	34	92	42	15.2	0.5	4	■	■	
58162	JS554200E2R600.0Z4-SIRA	2	E	20	20	42	109	54	19	6	4	■	■	
58197	JS554060E2R020.3Z4-SIRA	2	E	6	6	14	57	18	5.7	0.2	4	■	■	
58165	JS554060E2R100.3Z4-SIRA	2	E	6	6	14	57	18	5.7	1	4	■	■	
58200	JS554080E2R050.3Z4-SIRA	2	E	8	8	18	63	25	7.6	0.5	4	■	■	
58203	JS554100E2R050.3Z4-SIRA	2	E	10	10	22	72	29	9.5	0.5	4	■	■	
58204	JS554100E2R100.3Z4-SIRA	2	E	10	10	22	72	29	9.5	1	4	■	■	
58167	JS554100E2R250.3Z4-SIRA	2	E	10	10	22	72	29	9.5	2.5	4	■	■	
58208	JS554120E2R050.3Z4-SIRA	2	E	12	12	26	83	35	11.4	0.5	4	■	■	
58209	JS554120E2R100.3Z4-SIRA	2	E	12	12	26	83	35	11.4	1	4	■	■	
58168	JS554120E2R300.3Z4-SIRA	2	E	12	12	26	83	35	11.4	3	4	■	■	
58211	JS554160E2R050.3Z4-SIRA	2	E	16	16	34	92	42	15.2	0.5	4	■	■	
58170	JS554200E2R600.3Z4-SIRA	2	E	20	20	42	109	54	19	6	4	■	■	

Tolerances: dm<sub>m</sub>=h5 D<sub>c</sub>=e7 r<sub>c1</sub>=+/-0,02 mm ■ Stock standard. Subject to change refer to current price-and stock-list.

For Cutting Data see pages 54-55

# SOLID END MILLING

## MAXIMIZED HIGH FEED MACHINING JABRO®-HFM JHF980

With the right cutting tool and machine, high feed machining can produce metal removal rates that are significantly higher than conventional methods. The Jabro-HFM JHF980 solid-carbide end mills are a top choice in high feed machining - and now even more so with new 4- and 5-flute cutter options.

Engineered for extremely productive face, slot and select plunge milling applications, this tool takes advantage of the latest design and grinding developments to incorporate an increased number of flutes. This doubles the feed rate capability compared to previous Jabro end mills. When applied at the same table feed rates as the prior tools, these new high feed cutters deliver increased tool life results.

Optimal application of the Jabro high feed cutters depends on the machine tool, CNC and programming capabilities, as well as the workpiece material and part size. High feed machining pairs shallow axial depths of cut with accelerated table feed rates to produce the increased metal removal rates. Cutting forces are directed axially into the spindle, stabilizing the operation as well as minimizing vibration and machine wear.

### PRODUCT OVERVIEW

- Solid-carbide high feed tools excel in face, slot and plunge milling
- High feed capabilities yield significant productivity gains
- Reduced production costs when processing deep and shallow pockets
- Longer tool life than previous cutters when applied at the same table feed rates
- Low radial forces minimize vibration and machine wear
- Wide application area covered, from steel to exotic materials

### RANGE OVERVIEW

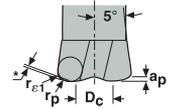
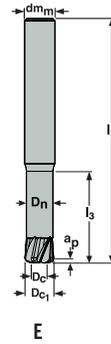
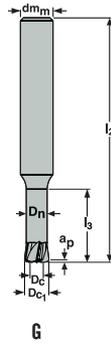
- 4-flute end mill diameters from 2 mm - 6 mm
- 5-flute end mill diameters from 8 mm - 12 mm
- 1.5xD, 3xD, 5xD and 7xD length versions available

### YOUR SECO BENEFIT

- Maximum metal removal
- Optimized feed rates
- High productivity
- Long tool life
- Reduced vibrations
- High process stability
- Less machine tool stress



# JABRO® SOLID<sup>2</sup> HFM JHF980



**NEW JHF980 - SOLID CARBIDE END MILL - CYLINDRICAL - HIGH FEED GEOMETRY**



EDP	DESCRIPTION	LENGTH INDEX	TOOL SHAPE	DIMENSIONS IN MM								r <sub>e1</sub>	r <sub>p</sub>	UTCN	α°	β	z <sub>n</sub>	CYLINDRICAL
				D <sub>c1</sub>	D <sub>c</sub>	dm <sub>m</sub>	a <sub>p</sub>	l <sub>2</sub>	l <sub>3</sub>	D <sub>n</sub>								
53531	JHF980080E1H.0Z5-MEGA	1	E	8	4	8	0.4	70	12	7	0.6	0.935	0.198	-	-	5	■	
53533	JHF980100E1H.0Z5-MEGA	1	E	10	5	10	0.45	80	15	8.8	0.8	1.176	0.232	-	-	5	■	
53535	JHF980120E1H.0Z5-MEGA	1	E	12	6	12	0.5	80	18	10.6	1	1.417	0.265	-	-	5	■	
53537	JHF980030G2H.0Z4-MEGA	2	G	3	1.5	6	0.2	50	9	2.6	0.2	0.366	0.085	7.12	-	4	■	
53538	JHF980040G2H.0Z4-MEGA	2	G	4	2	6	0.25	60	12	3.5	0.3	0.503	0.107	4	-	4	■	
53539	JHF980050G2H.0Z4-MEGA	2	G	5	2.5	6	0.3	60	15	4.4	0.4	0.641	0.128	1.77	-	4	■	
53540	JHF980060G2H.0Z4-MEGA	2	G	6	3	8	0.35	60	18	5.2	0.5	0.778	0.150	2.86	-	4	■	
53541	JHF980080E2H.0Z5-MEGA	2	E	8	4	8	0.4	70	24	7	0.6	0.935	0.198	-	-	5	■	
53546	JHF980100E2H.0Z5-MEGA	2	E	10	5	10	0.45	80	30	8.8	0.8	1.176	0.232	-	-	5	■	
53548	JHF980120E2H.0Z5-MEGA	2	E	12	6	12	0.5	80	36	10.6	1	1.417	0.265	-	-	5	■	
53549	JHF980020G3H.0Z4-MEGA	3	G	2	1	6	0.15	40	10	1.7	0.15	0.269	0.055	8.46	-	4	■	
53551	JHF980030G3H.0Z4-MEGA	3	G	3	1.5	6	0.2	50	15	2.6	0.2	0.366	0.085	4.79	-	4	■	
53553	JHF980040G3H.0Z4-MEGA	3	G	4	2	6	0.25	70	20	3.5	0.3	0.503	0.107	2.59	-	4	■	
53556	JHF980050G3H.0Z4-MEGA	3	G	5	2.5	6	0.3	80	25	4.4	0.4	0.641	0.128	1.12	-	4	■	
53558	JHF980060G3H.0Z4-MEGA	3	G	6	3	8	0.35	80	30	5.2	0.5	0.778	0.150	1.8	-	4	■	
53559	JHF980080E3H.0Z5-MEGA	3	E	8	4	8	0.4	80	40	7	0.6	0.935	0.198	-	-	5	■	
53565	JHF980100E3H.0Z5-MEGA	3	E	10	5	10	0.45	90	50	8.8	0.8	1.176	0.232	-	-	5	■	
53569	JHF980120E3H.0Z5-MEGA	3	E	12	6	12	0.5	110	60	10.6	1	1.417	0.265	-	-	5	■	
53570	JHF980030J4H.0Z4-MEGA	4	J	3	1.5	6	0.2	60	21	2.6	0.2	0.366	0.085	3.63	0.5	4	■	
53571	JHF980040J4H.0Z4-MEGA	4	J	4	2	6	0.25	80	28	3.5	0.3	0.503	0.107	1.93	0.5	4	■	
53573	JHF980050J4H.0Z4-MEGA	4	J	5	2.5	6	0.3	90	35	4.4	0.4	0.641	0.128	0.82	0.5	4	■	
53576	JHF980060J4H.0Z4-MEGA	4	J	6	3	8	0.35	100	42	5.2	0.5	0.778	0.150	1.33	0.5	4	■	
53578	JHF980080E4H.0Z5-MEGA	4	E	8	4	8	0.4	100	56	7	0.6	0.935	0.198	-	0.5	5	■	
53581	JHF980100E4H.0Z5-MEGA	4	E	10	5	10	0.45	110	70	8.8	0.8	1.176	0.232	-	0.5	5	■	
53582	JHF980120E4H.0Z5-MEGA	4	E	12	6	12	0.5	130	84	10.6	1	1.417	0.265	-	0.5	5	■	

Tolerances: dm<sub>m</sub>= h5 D<sub>c</sub>= 0,02/-0,04 mm r<sub>e1</sub>= +/-0,05 mm α°= collision angle ■ Stock standard. Subject to change refer to current price-and stock-list.

UTCN = uncut-thickness

For Cutting Data see pages 56-57

## NEW MDT FOR MULTI TASK MACHINING

# MDT

Suitable applications include turning of parts with many different diameters, complicated profiles and grooves. For complex parts of this type, several standard and special tools can be replaced by one Seco MDT tool. Savings can be achieved through fewer tool changes and reduced stock.

Seco MDT has a unique insert clamping method - Secoloc; a combination of top clamp and serrated contact surfaces between the insert and toolholder offers superb stability. The relatively long length of the inserts also increases the stability.

### YOUR SECO BENEFIT

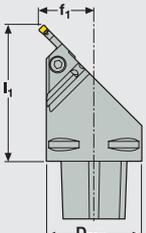
- Improved reliability
- Increased cutting data
- Good surface finish
- Less risk of vibrations
- Good repeatability

# CUT-OFF & GROOVING

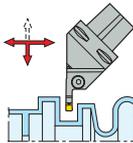


## NEW TOOLHOLDERS FOR INSERTS LCGN, LCMF AND LCMR

CDIR/L



Right-hand version shown  
 $a_r = 3 \times a_p$



	EDP	DESCRIPTION	DIMENSIONS IN INCH				LBS	SEAT SIZE	
			D <sub>5m</sub>	f <sub>1</sub>	L <sub>1</sub>	a <sub>r</sub>			
3	13276	C6-CDIR-33090-03JET	2.48	1.3	3.54	0.35	3.7	3	LC..1603..
4	13279	C6-CDIR-33090-04JET	2.48	1.3	3.54	0.47	3.7	4	LC..1604..
5	13281	C6-CDIR-33090-05JET	2.48	1.3	3.54	0.59	3.7	5	LC..1605..
6	13282	C6-CDIR-33090-06JET	2.48	1.3	3.54	0.71	3.7	6	LC..1606..
8	13283	C6-CDIR-33090-08JET	2.48	1.3	3.54	0.94	3.7	8	LC..3008..

# CUT-OFF & GROOVING



**EXPANSIONS BRING CUTTING SPEED & PRODUCTIVITY GAINS TO WIDER RANGE OF APPLICATIONS**

## X4 EXPANSION

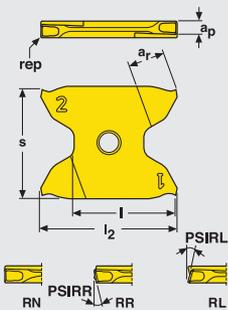
With new introductions including CP500 and TGH1050 grade inserts, Seco is expanding the benefits of its short-reach grooving and cut-off X4 system to an even greater range of applications. Featuring a highly stable design that incorporates multi-edge, tangential inserts, X4GK inserts offer tremendous benefits in the areas of accuracy, security, productivity and surface quality.

### YOUR SECO BENEFIT

- Minimized material consumption
- Precise grooving
- Longer tool life
- Rigidity and stability
- Increased productivity
- Easy loading insert in holder

### NEW X4GK INSERTS - RIGHT & LEFT HANDED

Tolerances:  
 $a_p = \pm 0.001$   $a_r = \pm 0.004$   
 $s = \pm 0.001$   $rep = \pm 0.001$   
 $PSIRR/PSIRL = \pm 0.25^\circ$



Right-hand insert (RN/RR/RL)  
 must only be used with Right-hand holder

DESCRIPTION	PSIRR°	PSIRL°	DIMENSIONS IN INCH						GRADES (EDP)	
			ap	ar*	l	l <sub>2</sub>	s	rep	COATED	
									CP500	TGH1050
<b>X4GK..RN-MC</b>										
X4GK 2503005-0050RN-MC	-	-	0.020	0.102	0.748	1.002	0.803	0.002	-	43140
X4GK 2503005-0100RN-MC	-	-	0.039	0.169	0.748	1.002	0.803	0.002	-	43142
X4GK 2503010-0150RN-MC	-	-	0.059	0.256	0.748	1.002	0.803	0.004	-	43164
X4GK 2503010-0200RN-MC	-	-	0.079	0.256	0.748	1.002	0.803	0.004	-	43228
X4GK 2503015-0250RN-MC	-	-	0.098	0.256	0.748	1.001	0.803	0.006	-	43261
X4GK 2503015-0300RN-MC	-	-	0.118	0.256	0.748	1.001	0.803	0.006	-	43316
X4GK 2503020-0150RN-MC	-	-	0.059	0.256	0.748	1.002	0.803	0.008	42861	-
X4GK 2503020-0200RN-MC	-	-	0.079	0.256	0.748	1.002	0.803	0.008	42884	-
X4GK 2503030-0250RN-MC	-	-	0.098	0.256	0.748	1.001	0.803	0.012	43014	-
X4GK 2503030-0300RN-MC	-	-	0.118	0.256	0.748	1.001	0.803	0.012	43017	-

\*Maximum cutting depth a<sub>p</sub> is limited relative to workpiece diameter to avoid contact between workpiece and toolholder

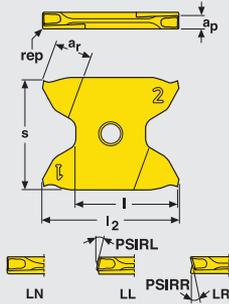
## NEW X4GK INSERTS - RIGHT & LEFT HANDED

Tolerances:

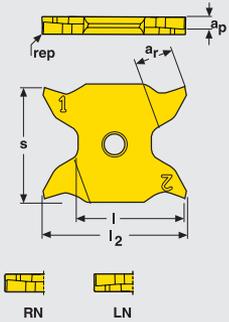
$a_p = \pm 0.001$   $a_r = \pm 0.004$

$s = \pm 0.001$   $rep = \pm 0.001$

$PSIRR/PSIRL = \pm 0.25^\circ$



Left-hand insert (LN/LR/LL) must only be used with Left-hand holder



Right-hand insert (RN/RR/RL) must only be used with Right-hand holder, Left-hand insert (LN/LR/LL) must only be used with Left-hand holder

DESCRIPTION	PSIRR°	PSIRL°	DIMENSIONS IN INCH						GRADES (EDP)	
			ap	ar*	l	l <sub>2</sub>	s	rep	COATED	
									CP500	TGH1050
<b>X4GK..RR-MC</b>										
X4GK 2503005-0150RR15-MC	15	-	0.059	0.256	0.748	0.999	0.801	0.002	46321	-
<b>X4GK..LN-MC</b>										
X4GK 2503005-0050LN-MC	-	-	0.020	0.102	0.748	1.002	0.803	0.002	-	43141
X4GK 2503005-0100LN-MC	-	-	0.039	0.169	0.748	1.002	0.803	0.002	-	43154
X4GK 2503010-0150LN-MC	-	-	0.059	0.256	0.748	1.002	0.803	0.004	-	43188
X4GK 2503010-0200LN-MC	-	-	0.079	0.256	0.748	1.002	0.803	0.004	-	43254
X4GK 2503015-0250LN-MC	-	-	0.098	0.256	0.748	1.001	0.803	0.006	-	43273
X4GK 2503015-0300LN-MC	-	-	0.118	0.256	0.748	1.001	0.803	0.006	-	43319
X4GK 2503020-0150LN-MC	-	-	0.059	0.256	0.748	1.002	0.803	0.008	42864	-
X4GK 2503020-0200LN-MC	-	-	0.079	0.256	0.748	1.002	0.803	0.008	43012	-
X4GK 2503030-0250LN-MC	-	-	0.098	0.256	0.748	1.001	0.803	0.012	43015	-
X4GK 2503030-0300LN-MC	-	-	0.118	0.256	0.748	1.001	0.803	0.012	43069	-
<b>X4GK..LL-MC</b>										
X4GK 2503005-0150LL15-MC	-	15	0.059	0.256	0.748	0.999	0.801	0.002	43078	-
<b>X4GK..RN-FG</b>										
X4GK 2503005-0050RN-FG	-	-	0.020	0.102	0.748	1.002	0.803	0.002	-	43323
X4GK 2503005-0100RN-FG	-	-	0.039	0.169	0.748	1.002	0.803	0.002	-	43362
X4GK 2503010-0150RN-FG	-	-	0.059	0.256	0.748	1.002	0.803	0.004	-	43369
X4GK 2503010-0200RN-FG	-	-	0.079	0.256	0.748	1.002	0.803	0.004	-	43379
X4GK 2503015-0250RN-FG	-	-	0.098	0.256	0.748	1.002	0.803	0.006	-	43387
X4GK 2503015-0300RN-FG	-	-	0.118	0.256	0.748	1.002	0.803	0.006	-	43389
<b>X4GK..LN-FG</b>										
X4GK 2503005-0050LN-FG	-	-	0.020	0.102	0.748	1.002	0.803	0.002	-	43327
X4GK 2503005-0100LN-FG	-	-	0.039	0.169	0.748	1.002	0.803	0.002	-	43367
X4GK 2503010-0150LN-FG	-	-	0.059	0.256	0.748	1.002	0.803	0.004	-	43375
X4GK 2503010-0200LN-FG	-	-	0.079	0.256	0.748	1.002	0.803	0.004	-	43380
X4GK 2503015-0250LN-FG	-	-	0.098	0.256	0.748	1.002	0.803	0.006	-	43388
X4GK 2503015-0300LN-FG	-	-	0.118	0.256	0.748	1.002	0.803	0.006	-	43394

\*Maximum cutting depth  $a_p$  is limited relative to workpiece diameter to avoid contact between workpiece and toolholder

# HOLEMAKING REAMING



## NEW REAMING SHANKS OFFER BUILT-IN FLOATING & ADJUSTABILITY

# PRECIMASTER™ PLUS

Two new tool shank designs from Seco offer floating and adjustability for fully optimized, high-precision reaming operations. As an extension of the Precimaster Plus indexable-head reaming system, the new PMX-FL and PMX-AD shanks greatly improve hole surface finishes, eliminate runout and correct for misalignment without the need for special toolholders.

Seco's new shanks incorporate compact internal systems for such functionalities, eliminating the need for special toolholders for floating and adjustability functions. Compared to special toolholders, the new shanks also situate reamers closer to machine spindle noses for less tool overhang.

Seco's built-in floating system for static and turning-machine reaming applications is purely mechanical and much more stable than the common rubber or elastomer-type technology used on other similar tools. Also, the internal adjustment on Seco's new shank for rotating applications is mechanical in design and uses six screws to provide precise settings and effectively correct for spindle runout down to less than .0002" (0.005 mm).

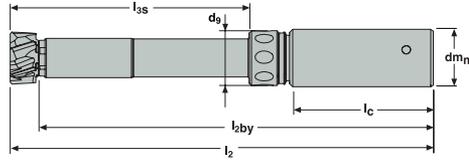
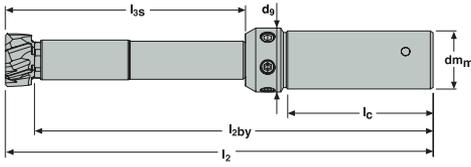
### PRODUCT OVERVIEW

- Compact design, less tool overhang
- Economical
- Accurate internal floating and adjusting systems
- High precision

### RANGE OVERVIEW

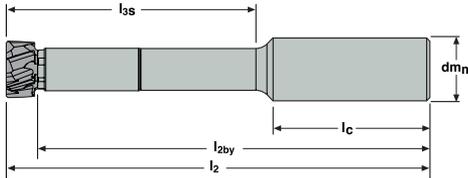
- PMX-FL floating shanks (static applications)
- PMX-AD adjustable shanks (rotating applications)
- Four sizes in each style for .3937" - 2.3818" (10 mm - 60.499 mm) diameters
- Runout compensation to less than .0002" (0.005 mm)
- Applicable to all materials

# HOLEMAKING REAMING



## NEW PRECIMASTER PLUS - ADJUSTABLE/FLOATING SHANKS FOR THROUGH AND BLIND HOLES

STYLE	D <sub>c</sub>	EDP	DESCRIPTION	DIMENSIONS MM					
				l <sub>2</sub>	l <sub>2by</sub>	l <sub>3s</sub>	l <sub>c</sub>	D <sub>m</sub>	d <sub>g</sub>
Metric									
ADJUSTABLE SHANKS FOR THROUGH HOLES	10-14.499	53479	PMX06T-AD-05700-16N1	117	110	57	48	16	18
	14.5-21.499	53483	PMX08T-AD-08200-20N1	147	137	82	50	20	22
	21.5-32.499	53486	PMX12T-AD-10400-25N1	179	167	104	56	25	28
	32.5-60.499	53488	PMX16T-AD-12700-32N1	214	200	127	60	32	34
ADJUSTABLE SHANKS FOR BLIND HOLES	10-14.499	53482	PMX06B-AD-05700-16N1	117	110	57	48	16	18
	14.5-21.499	53485	PMX08B-AD-08200-20N1	147	137	82	50	20	22
	21.5-32.499	53487	PMX12B-AD-10400-25N1	179	167	104	56	25	28
	32.5-60.499	53492	PMX16B-AD-12700-32N1	214	200	127	60	32	34
FLOATING SHANKS FOR THROUGH HOLES	10-14.499	53469	PMX06T-FL-05700-16N1	117	110	57	48	16	18
	14.5-21.499	53471	PMX08T-FL-08200-20N1	147	137	82	50	20	22
	21.5-32.499	53473	PMX12T-FL-10400-25N1	179	167	104	56	25	28
	32.5-60.499	53476	PMX16T-FL-12700-32N1	214	200	127	60	32	34
FLOATING SHANKS FOR BLIND HOLES	10-14.499	53470	PMX06B-FL-05700-16N1	117	110	57	48	16	18
	14.5-21.499	53472	PMX08B-FL-08200-20N1	147	137	82	50	20	22
	21.5-32.499	53475	PMX12B-FL-10400-25N1	179	167	104	56	25	28
	32.5-60.499	53478	PMX16B-FL-12700-32N1	214	200	127	60	32	34



## PRECIMASTER PLUS - SHANKS FOR THROUGH AND BLIND HOLES

D <sub>c</sub>	TOOL HOLDER MATERIAL	EDP	DESCRIPTION	DIMENSIONS MM				
				l <sub>2</sub>	l <sub>2by</sub>	l <sub>3s</sub>	l <sub>c</sub>	D <sub>m</sub>
Metric								
10.5 - 14.499	Steel	14352	PMX06-03700-12N1	84	77	37	45	12
	Steel	14353	PMX06-05700-12N1	104	97	57	45	12
	Steel	14354	PMX06-12000-12N1	167	160	120	45	12
	Carbide	14355	PMX06HM-12000-12N1	167	160	120	45	12
14.5 - 21.499	Steel	14356	PMX08-04600-20N1	99	89	46	50	20
	Steel	14357	PMX08-08200-20N1	135	125	82	50	20
	Steel	14358	PMX08-14500-20N1	198	188	145	50	20
	Carbide	14362	PMX08HM-14500-20N1	198	188	145	50	20
21.5 - 32.499	Steel	14363	PMX12-06800-25N1	127	115	68	56	25
	Steel	14364	PMX12-10400-25N1	163	151	104	56	25
	Steel	14365	PMX12-17000-25N1	229	217	170	56	25
	Carbide	14366	PMX12HM-17000-25N1	229	217	170	56	25
32.5 - 60.499	Steel	14367	PMX16-06300-32N1	124	110	63	61	32
	Steel	14368	PMX16-12700-32N1	188	174	127	61	32
	Steel	14370	PMX16-17000-32N1	231	217	170	61	32
	Carbide	14372	PMX16HM-17000-32N1	231	217	170	61	32



### YOUR SECO BENEFIT

- Optimized, stable, high-precision reaming
- Compact tool setup
- Reduced tooling inventory and cost
- Versatility and reliability
- Superior surface finishes
- Ease of use
- Longer tool life

For Cutting Data see pages 58-59

# PRODUCTIVITY COST ANALYSIS (PCA)

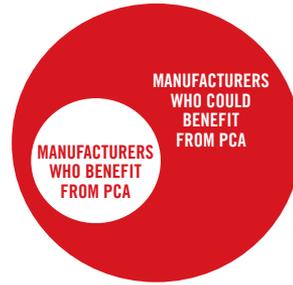
The process by which we work with our customers to evaluate their processes and identify areas where cost can be reduced and significant productivity gains can be made.



## HOW IS IT DONE?

# THE 3 STAGES OF PCA

By benchmarking the current process, we can identify where the greatest savings can be achieved. Once we have the benchmark data, we can begin to apply our extensive experience within our global metalcutting organization to create an optimized solution to suit the manufacturing environment.



Over **\$50M** in savings for our customers each year.

**STAGE 1**  
CURRENT METHOD  
TIME & COST  
BENCHMARK



**STAGE 2**  
INITIAL CHANGE  
TIME & COST  
CONVERSION

**STAGE 3**  
METHOD REVIEW  
TIME & COST  
PROCESS IMPROVEMENT

PRODUCTIVITY



**LONG TERM METHOD**  
TIME & COST  
CONTINUOUS IMPROVEMENT

**CONTACT YOUR LOCAL TECHNICAL SPECIALIST TO  
TAKE ADVANTAGE OF THIS MONEY SAVING TOOL.**



SMG v2 is the foundation for a new and accurate way of organizing work materials and choosing the correct speed, feed rate and depth of cut for any work material and any Seco tool. In addition to using a greater number of work material groups compared to our previous system, SMG v2 also incorporates a reference material - or standard - for each group. The machinability of all other materials within that group can be compared to the standard, allowing for adjustments to the cutting data and accounting for the unique characteristics of each material.

**THE USE OF SMG v2 IS ILLUSTRATED BELOW**

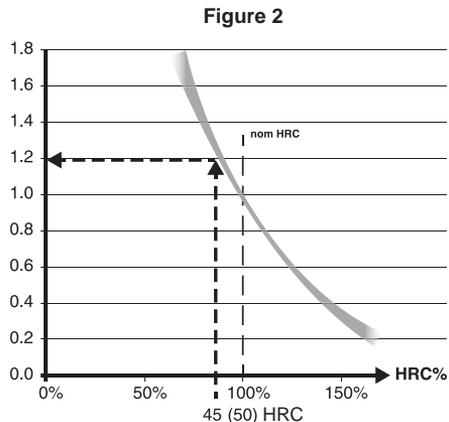
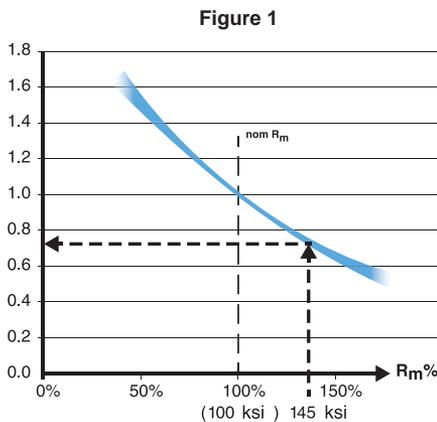
As shown in Table I, the reference material for work material group P4 is 1045, for P5 it is 4140 steel and for H5 it is 4140 hardened to 50 HRC. 4140 steel is available in a wide variety of hardness and tensile strengths. It will be expected that the machinability will vary with these properties.

SMG	DESCRIPTION	PROPERTIES (KSI)	REFERENCE	SMG	DESCRIPTION	PROPERTIES	REFERENCE
P4	Low alloy general structural steels, 0.25% < C < 0.67%wt	75 < UTS < 175	1045 UTS = 95 ksi	H5	Quenched & Tempered steels	38 < HRC < 56	4140 50 HRC
	Low alloy Quench & Temper steels						
P5	Structural steels, 0.25% < C < 0.67%wt Quench & Temper steels	80 < UTS < 175	4140 UTS = 100 ksi				

Table II gives some examples of 4140 in different conditions.

SMG	EN	W-Nr	AFNOR	BS	UNI	JIS	AISI / ASTM	GOST	CONDITION	UTS (ksi)	HRC <sub>nom</sub>
P5	42 CrMo 4	1.1201	42 CD 4	708 M 40	42 CrMo 4	SCM 440 (H)	4142, 4140	38HM	Annealed	100	
	42 CrMo 4	1.1201	42 CD 4	708 M 40	42 CrMo 4	SCM 440 (H)	4142, 4140	38HM	Quenched & Tempered	145	
H5	42 CrMo 4	1.1201	42 CD 4	708 M 40	42 CrMo 4	SCM 440 (H)	4142, 4140	38HM	Quenched & Tempered		45
	42 CrMo 4	1.1201	42 CD 4	708 M 40	42 CrMo 4	SCM 440 (H)	4142, 4140	38HM	Quenched & Tempered		50

The graphs indicate how the speed recommendation for a specific material can be adjusted to account for the different properties of the steel. As an example, consider 4140 with a tensile strength (UTS) of 145 ksi. The standard material for SMG P5 is 4140 steel with a tensile strength of 100 ksi. Since the material of interest is 45% stronger, the cutting speed will have to be reduced. Following the black arrows in Figure 1, it can be seen that a speed 75% of that recommended for 4140 at 100 ksi should be used. So if a cutting speed of 900 sf/min is suggested for a tool of interest when machining 4140 at 100 ksi, a speed of 675 sf/min (900 X 0.75) should be used if the 4140 has a tensile strength of 145 ksi.



If the 4140 is quenched and tempered to a hardness of 45 HRC, an accurate cutting speed can be obtained by using Figure 2. The standard material for SMG H5 is 4140 heat treated to a hardness of 50 HRC. Logically, a softer material, in this case 45 HRC, can be machined at a higher speed. Since the hardness, 45 HRC, is 90% that of the standard material, Figure 2 shows a speed 120% that of the standard could be used. If a speed of 200 sfpm is recommended when machining 4140 at 50 HRC, a speed of 240 sf/min (200 X 1.2) could be used if the 4140 is 45 HRC.

# SQUARE T4-12

## R217/220.94-12 - Insert selection

SMG		Recommended $a_p$ **	$f_z$		
			100%	30%	10%
P1	LOEX120708TR-M12 F40M	0.24	0.0071	0.0079	0.012
P2	LOEX120708TR-M12 F40M	0.24	0.0075	0.0079	0.013
P3	LOEX120708TR-M12 MP2500	0.24	0.0071	0.0075	0.012
P4	LOEX120708TR-M12 MP2500	0.24	0.0067	0.0075	0.012
P5	LOEX120708TR-M12 MP2500	0.24	0.0067	0.0075	0.011
P6	LOEX120708TR-M12 MP2500	0.24	0.0067	0.0071	0.011
P7	LOEX120708TR-M12 MP2500	0.24	0.0067	0.0071	0.011
P8	LOEX120708TR-M12 MP2500	0.24	0.0071	0.0075	0.012
P11	LOEX120708TR-M12 MP3000	0.24	0.0067	0.0071	0.011
M1	LOEX120708TR-M12 F40M	0.24	0.0075	0.0079	0.013
M2	LOEX120708TR-M12 F40M	0.24	0.0067	0.0075	0.011
M3	LOEX120708TR-M12 F40M	0.20	0.0055	0.0059	0.0087
M4	LOEX120708TR-M12 F40M	0.16	0.0047	0.0051	0.0079
M5	LOEX120708TR-M12 F40M	0.16	0.0047	0.0051	0.0079
K1	LOEX120708TR-MD13 MK2050	0.24	0.0079	0.0087	0.013
K2	LOEX120708TR-MD13 MK2050	0.24	0.0071	0.0079	0.012
K3	LOEX120708TR-MD13 MK2050	0.24	0.0071	0.0079	0.012
K4	LOEX120708TR-MD13 MK2050	0.24	0.0071	0.0079	0.012
K5	LOEX120708TR-MD13 MK2050	0.24	0.0067	0.0071	0.011
K6	LOEX120708TR-MD13 MK2050	0.24	0.0071	0.0079	0.012
K7	LOEX120708TR-MD13 MK2050	0.24	0.0067	0.0071	0.011
N1	LOEX120708TR-M12 F40M	0.24	0.0094	0.010	0.016
N2	LOEX120708TR-M12 F40M	0.24	0.0094	0.010	0.016
N3	LOEX120708TR-M12 F40M	0.24	0.0094	0.010	0.016
N11	LOEX120708TR-M12 F40M	0.24	0.0094	0.010	0.016
S1	LOEX120708TR-M12 T350M	0.16	0.0047	0.0051	0.0079
S2	LOEX120708TR-M12 T350M	0.16	0.0047	0.0051	0.0079
S3	LOEX120708TR-M12 T350M	0.16	0.0043	0.0047	0.0075
S11	LOEX120708TR-M12 MS2050	0.18	0.0055	0.0059	0.0094
S12	LOEX120708TR-M12 MS2050	0.18	0.0055	0.0059	0.0094
S13	LOEX120708TR-M12 MS2050	0.16	0.0047	0.0051	0.0079

\*\* For optimum tool life for slotting. For profiling, max  $a_p$  recommended for radial engagement ( $a_g$ ) 30% or less.

SMG = Seco Material Group

$f_z$  = in/tooth

$a_p$  = inch

$v_c$  = sf/min

$a_g/D_c$  = %

All cutting data are start values

# SQUARE T4-12

## R217/220.94-12 - Cutting data $v_c =$ (sf/min)

SMG	MP1500			MS2500			MP3000			T350M			MK1500			MK2050		
	100%	30%	10%	100%	30%	10%	100%	30%	10%	100%	30%	10%	100%	30%	10%	100%	30%	10%
P1	930	1225	1450	960	1275	1525	840	1100	1325	770	1025	1200	-	-	-	810	1075	1275
P2	910	1200	1425	920	1250	1450	800	1075	1250	740	990	1150	-	-	-	790	1050	1225
P3	790	1075	1250	810	1075	1275	700	940	1100	650	860	1025	-	-	-	690	930	1075
P4	700	940	1100	720	950	1125	630	830	970	580	760	890	-	-	-	610	820	950
P5	680	890	1075	690	910	1100	600	790	950	550	730	870	-	-	-	590	780	930
P6	760	1000	1200	780	1050	1225	670	900	1050	620	830	980	-	-	-	660	880	1050
P7	720	950	1125	730	980	1150	640	850	1000	580	780	920	-	-	-	630	830	980
P8	670	890	1050	680	910	1075	590	790	930	540	730	850	-	-	-	580	780	910
P11	700	920	1100	710	950	1125	620	830	970	570	760	900	-	-	-	610	800	960
M1	-	-	-	-	660	890	1025	600	800	940	570	760	890	-	-	-	-	-
M2	-	-	-	-	550	730	870	500	660	790	475	630	750	-	-	-	-	-
M3	-	-	-	-	450	600	710	405	540	640	385	510	610	-	-	-	-	-
K1	720	950	1125	730	980	1150	630	850	990	-	-	-	900	1200	1400	850	1125	1325
K2	640	850	1000	660	860	1025	570	750	900	-	-	-	810	1075	1275	760	1000	1200
K3	540	720	860	560	730	870	480	630	760	-	-	-	680	900	1075	650	850	1025
K4	520	690	820	530	700	830	460	610	720	-	-	-	650	860	1025	620	820	970
K5	315	420	495	330	430	510	285	375	440	-	-	-	395	530	620	375	500	590
K6	460	600	720	465	610	740	405	530	640	-	-	-	570	760	900	540	720	850
K7	405	540	640	420	550	650	365	475	560	-	-	-	510	680	800	480	640	750
N1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S1	-	-	-	-	-	-	150	200	230	140	185	220	-	-	-	-	-	-
S2	-	-	-	-	-	-	120	160	185	115	150	175	-	-	-	-	-	-
S3	-	-	-	-	-	-	105	140	165	100	135	155	-	-	-	-	-	-
S11	-	-	-	-	-	-	205	275	325	195	260	310	-	-	-	-	-	-
S12	-	-	-	-	-	-	120	160	190	115	150	180	-	-	-	-	-	-
S13	-	-	-	-	-	-	95	130	150	90	120	140	-	-	-	-	-	-

## R217/220.94-12 - Cutting data $v_c =$ (sf/min)

SMG	F40M			MM4500			MS2050			T25M		
	100%	30%	10%	100%	30%	10%	100%	30%	10%	100%	30%	10%
P1	670	880	1050	540	720	850	-	-	-	740	970	1150
P2	640	860	1000	520	700	810	-	-	-	710	950	1100
P3	560	750	880	455	610	710	-	-	-	620	830	970
P4	500	660	780	405	540	630	-	-	-	550	730	850
P5	480	630	760	390	510	610	-	-	-	530	700	830
P6	540	720	850	435	580	690	-	-	-	590	790	930
P7	510	680	800	410	550	650	-	-	-	560	750	880
P8	470	630	740	380	510	600	-	-	-	520	700	820
P11	495	660	780	400	540	630	-	-	-	540	730	860
M1	520	690	810	445	600	700	670	860	960	570	760	890
M2	430	570	680	375	490	590	560	700	800	475	630	750
M3	350	465	550	300	400	480	450	550	610	385	510	610
M4	275	365	425	240	315	370	340	405	445	305	400	470
M5	230	305	355	200	260	305	285	335	375	255	335	390
K1	510	680	800	-	-	-	-	-	-	560	750	880
K2	455	600	720	-	-	-	-	-	-	500	660	790
K3	385	510	610	-	-	-	-	-	-	425	560	670
K4	370	485	580	-	-	-	-	-	-	405	530	640
K5	225	300	355	-	-	-	-	-	-	250	330	390
K6	325	425	510	-	-	-	-	-	-	355	470	560
K7	290	380	450	-	-	-	-	-	-	320	420	495
N1	1850	2475	2950	-	-	-	-	-	-	-	-	-
N2	1500	2000	2375	-	-	-	-	-	-	-	-	-
N3	1000	1325	1575	-	-	-	-	-	-	-	-	-
N11	1150	1525	1800	-	-	-	-	-	-	-	-	-
S1	130	170	200	75	95	115	120	160	180	-	-	-
S2	105	135	160	60	80	90	100	130	145	-	-	-
S3	90	120	140	50	70	80	90	115	135	-	-	-
S11	175	235	280	100	135	160	155	210	250	-	-	-
S12	100	135	160	75	105	120	120	160	190	-	-	-
S13	85	110	130	65	85	95	105	135	155	-	-	-

# SQUARE T4-12 HELICAL

## R217/220.94-12 - Insert selection

SMG		$f_z$		
		100%	30%	10%
P1	LOEX120708TR-M12 F40M	0.0059	0.0063	0.0094
P2	LOEX120708TR-M12 F40M	0.0059	0.0063	0.0094
P3	LOEX120708TR-M12 F40M	0.0055	0.0059	0.0094
P4	LOEX120708TR-M12 F40M	0.0055	0.0059	0.0094
P5	LOEX120708TR-M12 MP2500	0.0055	0.0059	0.0087
P6	LOEX120708TR-M12 MP2500	0.0051	0.0059	0.0087
P7	LOEX120708TR-M12 MP2500	0.0051	0.0059	0.0087
P8	LOEX120708TR-M12 MP2500	0.0055	0.0059	0.0094
P11	LOEX120708TR-M12 T350M	0.0051	0.0059	0.0087
M1	LOEX120708TR-M12 F40M	0.0059	0.0063	0.0094
M2	LOEX120708TR-M12 F40M	0.0055	0.0059	0.0087
M3	LOEX120708TR-M12 F40M	0.0043	0.0047	0.0071
M4	LOEX120708TR-M12 F40M	0.0037	0.0039	0.0063
M5	LOEX120708TR-M12 F40M	0.0037	0.0039	0.0063
K1	LOEX120708TR-MD13 MK2050	0.0063	0.0067	0.010
K2	LOEX120708TR-MD13 MK2050	0.0059	0.0063	0.0094
K3	LOEX120708TR-MD13 MK2050	0.0059	0.0063	0.0094
K4	LOEX120708TR-MD13 MK2050	0.0059	0.0063	0.0094
K5	LOEX120708TR-MD13 MK2050	0.0051	0.0055	0.0087
K6	LOEX120708TR-MD13 MK2050	0.0059	0.0063	0.0094
K7	LOEX120708TR-MD13 MK2050	0.0051	0.0055	0.0087
S1	LOEX120708TR-M12 F40M	0.0037	0.0039	0.0063
S2	LOEX120708TR-M12 F40M	0.0037	0.0039	0.0063
S3	LOEX120708TR-M12 F40M	0.0035	0.0037	0.0059
S11	LOEX120708TR-M12 MS2050	0.0043	0.0047	0.0071
S12	LOEX120708TR-M12 MS2050	0.0043	0.0047	0.0071
S13	LOEX120708TR-M12 MS2050	0.0037	0.0039	0.0063

SMG = Seco Material Group

 $f_z$  = in/tooth $v_c$  = sf/min $a_e/D_c$  = %

All cutting data are start values

# SQUARE T4-12 HELICAL

R217/220.94-12 - Cutting data  $v_c = (sf/min)$

SMG	MK1500			MK2050			MM4500			MS2050		
	100%	30%	10%	100%	30%	10%	100%	30%	10%	100%	30%	10%
P1	-	-	-	500	560	600	410	470	510	-	-	-
P2	-	-	-	495	560	590	405	465	500	-	-	-
P3	-	-	-	465	520	560	375	435	470	-	-	-
P4	-	-	-	435	500	540	345	410	445	-	-	-
P5	-	-	-	425	490	530	335	400	440	-	-	-
P6	-	-	-	455	520	550	365	425	465	-	-	-
P7	-	-	-	445	500	540	355	410	450	-	-	-
P8	-	-	-	425	485	520	335	400	435	-	-	-
P11	-	-	-	440	495	540	345	405	445	-	-	-
M1	-	-	-	-	-	-	370	435	470	460	510	530
M2	-	-	-	-	-	-	325	390	430	415	460	485
M3	-	-	-	-	-	-	285	345	380	360	400	415
M4	-	-	-	-	-	-	230	290	325	295	325	345
M5	-	-	-	-	-	-	190	250	285	255	285	305
K1	520	590	620	510	570	610	-	-	-	-	-	-
K2	495	560	600	485	550	590	-	-	-	-	-	-
K3	460	520	560	445	510	550	-	-	-	-	-	-
K4	450	510	550	435	500	540	-	-	-	-	-	-
K5	345	405	440	335	395	430	-	-	-	-	-	-
K6	420	485	520	410	470	510	-	-	-	-	-	-
K7	400	460	495	385	450	485	-	-	-	-	-	-
S1	-	-	-	-	-	-	70	95	110	125	165	185
S2	-	-	-	-	-	-	55	75	90	100	135	150
S3	-	-	-	-	-	-	49	65	75	90	120	135
S11	-	-	-	-	-	-	95	130	155	165	215	250
S12	-	-	-	-	-	-	75	100	120	125	165	195
S13	-	-	-	-	-	-	60	80	95	110	140	160

R217/220.94-12 - Cutting data  $v_c = (sf/min)$

SMG	MP1500			MP2500			MP3000			T350M			F40M		
	100%	30%	10%	100%	30%	10%	100%	30%	10%	100%	30%	10%	100%	30%	10%
P1	530	590	630	510	580	620	500	570	600	485	550	590	455	520	560
P2	520	590	620	510	570	610	495	560	600	480	540	580	450	510	550
P3	495	550	590	480	540	580	470	530	570	450	510	550	420	485	520
P4	465	530	570	455	520	550	440	500	540	425	485	520	390	455	490
P5	455	520	560	445	510	550	430	495	530	415	475	520	380	445	485
P6	485	550	580	475	530	570	460	520	560	445	500	540	410	470	510
P7	475	530	570	460	520	560	450	510	550	430	490	530	400	460	495
P8	455	520	550	445	510	540	430	495	530	415	475	510	380	445	480
P11	470	530	570	455	510	550	440	500	540	425	480	520	395	450	490
M1	-	-	-	440	500	540	435	495	540	420	485	520	400	465	500
M2	-	-	-	395	460	500	390	455	495	380	445	485	360	420	460
M3	-	-	-	350	415	450	350	410	445	335	395	435	315	375	415
M4	-	-	-	300	360	395	295	355	390	280	345	380	260	325	360
M5	-	-	-	260	320	355	255	315	350	245	305	340	220	285	320
K1	475	540	570	460	520	560	445	510	550	-	-	-	400	460	500
K2	445	510	550	430	495	530	420	485	520	-	-	-	370	435	475
K3	410	475	510	395	460	500	385	445	485	-	-	-	335	395	435
K4	400	460	500	385	450	485	375	435	475	-	-	-	325	385	425
K5	295	355	395	280	345	380	270	330	370	-	-	-	220	285	320
K6	370	435	475	355	420	460	345	410	450	-	-	-	295	360	400
K7	350	410	445	335	395	435	325	385	420	-	-	-	275	335	375
S1	-	-	-	-	-	-	145	190	225	135	180	210	125	165	195
S2	-	-	-	-	-	-	115	155	180	110	145	170	100	135	155
S3	-	-	-	-	-	-	100	135	160	95	130	150	85	115	135
S11	-	-	-	-	-	-	200	260	295	190	250	285	170	230	265
S12	-	-	-	-	-	-	115	155	180	110	145	170	100	130	155
S13	-	-	-	-	-	-	95	125	145	90	120	135	80	105	125

## DOUBLE OCTO 05 CASSETTE

## R220.48-05 - Insert selection

SMG		$a_p$	$f_z$		
			100%	30%	10%
P1	ONMU050410ANTN-M10 MP2500	0.070	0.0085	0.0095	0.014
P2	ONMU050410ANTN-M10 MP2500	0.070	0.0085	0.0095	0.015
P3	ONMU050410ANTN-M10 MP2500	0.070	0.0085	0.0085	0.014
P4	ONMU050410ANTN-M10 MP2500	0.070	0.0080	0.0085	0.013
P5	ONMU050410ANTN-M10 MP2500	0.070	0.0080	0.0085	0.013
P6	ONMU050410ANTN-M10 MP2500	0.070	0.0080	0.0085	0.013
P7	ONMU050410ANTN-M10 MP2500	0.070	0.0080	0.0085	0.013
P8	ONMU050410ANTN-M10 MP1500	0.070	0.0085	0.0085	0.014
P11	ONMU050410ANTN-M10 MP1500	0.070	0.0080	0.0085	0.013
M1	ONMU050410ANTN-ME10 MS2050	0.070	0.0085	0.0095	0.015
M2	ONMU050410ANTN-ME10 MS2050	0.070	0.0080	0.0085	0.013
M3	ONMU050410ANTN-ME10 MS2050	0.055	0.0065	0.0070	0.011
M4	ONMU050410ANTN-M10 T350M	0.044	0.0055	0.0060	0.0095
M5	ONMU050410ANTN-M10 MM4500	0.044	0.0055	0.0060	0.0095
K1	ONMU050410ANTN-M10 MK2050	0.070	0.0085	0.0095	0.015
K2	ONMU050410ANTN-M10 MK2050	0.070	0.0080	0.0085	0.013
K3	ONMU050410ANTN-M10 MK2050	0.070	0.0080	0.0085	0.013
K4	ONMU050410ANTN-M10 MK2050	0.070	0.0080	0.0085	0.013
K5	ONMU050410ANTN-M10 MK2050	0.070	0.0070	0.0080	0.012
K6	ONMU050410ANTN-M10 MK2050	0.070	0.0080	0.0085	0.013
K7	ONMU050410ANTN-M10 MK2050	0.070	0.0070	0.0080	0.012
N1	ONMU050410ANTN-ME10 F40M	0.070	0.011	0.012	0.019
N2	ONMU050410ANTN-ME10 F40M	0.070	0.011	0.012	0.019
N3	ONMU050410ANTN-ME10 F40M	0.070	0.011	0.012	0.019
N11	ONMU050410ANTN-ME10 F40M	0.070	0.011	0.012	0.019
S1	ONMU050410ANTN-ME10 F40M	0.044	0.0055	0.0060	0.0095
S2	ONMU050410ANTN-ME10 F40M	0.044	0.0055	0.0060	0.0095
S3	ONMU050410ANTN-ME10 F40M	0.044	0.0050	0.0055	0.0085
S11	ONMU050410ANTN-ME10 MS2050	0.050	0.0065	0.0070	0.011
S12	ONMU050410ANTN-ME10 MS2050	0.050	0.0065	0.0070	0.011
S13	ONMU050410ANTN-ME10 MS2050	0.044	0.0055	0.0060	0.0095
H5	ONMU050410ANTN-M10 MP1500	0.055	0.0055	0.0060	0.0085
H8	ONMU050410ANTN-M10 MP1500	0.050	0.0044	0.0044	0.0070
H11	ONMU050410ANTN-M10 MP1500	0.055	0.0055	0.0060	0.0085
H12	ONMU050410ANTN-M10 MP1500	0.055	0.0055	0.0060	0.0085
H21	ONMU050410ANTN-M10 MP1500	0.050	0.0044	0.0044	0.0070

SMG = Seco Material Group

 $f_z$  = in/tooth $a_p$  = inch $v_c$  = sf/min $a_e/D_c$  = %

All cutting data are start values.

## DOUBLE OCTO 05 CASSETTE

R220.48-05 - Cutting data  $v_c =$  (sf/min)

SMG	MP1020			MP1500			MP2500			MP3000			T350M			F40M		
	100%	30%	10%	100%	30%	10%	100%	30%	10%	100%	30%	10%	100%	30%	10%	100%	30%	10%
P1	1050	1275	1450	1050	1400	1650	920	1225	1475	870	1175	1400	800	1075	1275	700	940	1125
P2	1025	1250	1375	1000	1350	1600	900	1200	1400	850	1150	1325	780	1050	1225	680	910	1075
P3	880	1125	1200	870	1200	1400	770	1050	1225	730	1000	1175	670	920	1075	580	800	930
P4	830	990	1100	790	1050	1250	700	930	1100	660	880	1050	610	810	960	530	710	840
P5	790	950	1050	750	1000	1200	670	890	1050	630	840	1000	580	780	920	500	670	800
P6	890	1075	1175	840	1125	1325	750	1000	1175	710	950	1125	650	870	1025	570	760	900
P7	840	1000	1100	800	1075	1250	710	940	1125	670	890	1050	610	820	970	530	710	840
P8	740	950	1025	730	1000	1175	650	890	1025	610	840	980	560	780	900	490	670	790
P11	820	980	1075	770	1025	1225	690	920	1075	650	870	1025	600	800	940	520	690	820
M1	-	-	-	-	-	-	650	870	1025	630	850	1000	600	810	950	550	730	860
M2	-	-	-	-	-	-	540	720	850	530	700	830	500	670	790	455	610	720
M3	-	-	-	-	-	-	435	570	680	425	560	670	405	530	630	365	485	580
M4	-	-	-	-	-	-	335	450	530	330	440	520	315	420	495	285	380	450
M5	-	-	-	-	-	-	280	375	440	275	370	435	260	350	410	235	315	375
K1	-	-	-	800	1075	1275	710	950	1125	670	900	1050	620	830	970	540	720	850
K2	-	-	-	710	950	1125	630	850	1000	600	800	950	550	740	870	480	640	760
K3	-	-	-	600	810	950	530	720	850	510	680	800	465	620	740	405	540	640
K4	-	-	-	580	770	910	510	680	810	485	650	760	445	590	700	385	520	610
K5	-	-	-	355	470	560	315	415	495	295	395	470	275	365	430	235	315	375
K6	-	-	-	510	680	800	450	600	710	425	570	670	390	520	620	340	455	540
K7	-	-	-	450	600	720	400	530	640	380	510	600	350	465	550	305	405	480
N1	-	-	-	-	-	-	2600	3525	4150	2475	3350	3925	-	-	-	1975	2675	3125
N2	-	-	-	-	-	-	2100	2850	3350	2000	2700	3175	-	-	-	1600	2150	2525
N3	-	-	-	-	-	-	1400	1900	2225	1325	1800	2100	-	-	-	1075	1450	1700
N11	-	-	-	-	-	-	1600	2175	2550	1525	2050	2425	-	-	-	1225	1650	1925
S1	-	-	-	-	-	-	165	220	255	155	205	240	145	195	230	135	180	210
S2	-	-	-	-	-	-	130	175	205	125	165	195	120	155	185	105	145	170
S3	-	-	-	-	-	-	115	155	180	110	145	170	105	140	165	95	125	150
S11	-	-	-	-	-	-	230	300	360	215	285	335	205	270	320	185	245	290
S12	-	-	-	-	-	-	130	175	205	125	165	195	120	155	185	105	140	170
S13	-	-	-	-	-	-	105	140	165	100	135	155	95	125	150	85	115	135
H5	-	-	-	165	225	265	135	180	215	130	175	210	130	170	205	110	150	180
H8	-	-	-	175	240	280	140	190	225	140	190	220	135	185	215	120	160	190
H11	-	-	-	210	285	340	170	230	275	165	225	265	165	220	260	140	190	230
H12	-	-	-	320	430	510	260	345	415	250	335	405	245	330	395	215	290	345
H21	-	-	-	175	240	280	140	190	225	140	190	220	135	185	215	120	160	190

## DOUBLE OCTO 05 CASSETTE

R220.48-05 - Cutting data  $v_c =$  (sf/min)

SMG	MK1500			MK2050			MM4500			MS2050		
	100%	30%	10%	100%	30%	10%	100%	30%	10%	100%	30%	10%
P1	-	-	-	910	1225	1450	560	760	900	840	1025	1150
P2	-	-	-	880	1175	1400	550	740	870	810	1000	1125
P3	-	-	-	760	1050	1225	475	650	760	700	860	960
P4	-	-	-	690	920	1075	430	570	680	630	760	840
P5	-	-	-	660	880	1025	410	550	650	600	730	800
P6	-	-	-	740	980	1175	460	610	730	670	820	900
P7	-	-	-	690	930	1100	435	580	680	630	770	850
P8	-	-	-	640	880	1025	400	550	640	590	730	810
P11	-	-	-	670	900	1075	420	560	670	620	750	830
M1	-	-	-	-	-	-	470	630	740	710	880	980
M2	-	-	-	-	-	-	390	520	620	580	710	790
M3	-	-	-	-	-	-	315	420	495	445	530	570
M4	-	-	-	-	-	-	245	330	385	325	370	405
M5	-	-	-	-	-	-	205	275	320	270	310	340
K1	1000	1350	1575	950	1275	1500	-	-	-	820	1025	1125
K2	900	1200	1425	850	1125	1350	-	-	-	720	880	970
K3	760	1025	1200	720	960	1125	-	-	-	610	740	820
K4	720	970	1150	680	920	1075	-	-	-	580	710	790
K5	445	590	700	420	560	670	-	-	-	350	420	455
K6	640	850	1000	600	810	950	-	-	-	510	630	690
K7	570	760	900	540	720	850	-	-	-	450	540	590
N1	-	-	-	-	-	-	-	-	-	-	-	-
N2	-	-	-	-	-	-	-	-	-	-	-	-
N3	-	-	-	-	-	-	-	-	-	-	-	-
N11	-	-	-	-	-	-	-	-	-	-	-	-
S1	-	-	-	-	-	-	75	100	120	135	180	205
S2	-	-	-	-	-	-	60	80	95	110	145	165
S3	-	-	-	-	-	-	55	70	85	100	130	150
S11	-	-	-	-	-	-	105	140	165	180	235	275
S12	-	-	-	-	-	-	80	105	125	140	180	210
S13	-	-	-	-	-	-	65	85	100	115	155	175
H5	-	-	-	-	-	-	-	-	-	-	-	-
H8	-	-	-	-	-	-	-	-	-	-	-	-
H11	-	-	-	-	-	-	-	-	-	-	-	-
H12	-	-	-	-	-	-	-	-	-	-	-	-
H21	-	-	-	-	-	-	-	-	-	-	-	-

# QUATTROMILL CLOSE PITCH

## R220.53-12 - Insert selection

SMG		$a_p$	$f_z$		
			100%	30%	10%
P1	SEMX1204AFTN-M15 MP2500	0.14	0.012	0.013	0.020
P2	SEMX1204AFTN-M15 MP2500	0.14	0.012	0.013	0.020
P3	SEMX1204AFTN-M15 MP2500	0.14	0.011	0.013	0.019
P4	SEMX1204AFTN-M15 MP2500	0.14	0.011	0.012	0.019
P5	SEMX1204AFTN-M15 MP2500	0.14	0.011	0.012	0.018
P6	SEMX1204AFTN-M15 MP2500	0.14	0.011	0.012	0.018
P7	SEMX1204AFTN-M15 T350M	0.14	0.011	0.012	0.018
P8	SEMX1204AFTN-M15 T350M	0.14	0.011	0.013	0.019
P11	SEMX1204AFTN-M15 T350M	0.14	0.011	0.012	0.018
M1	SEEX1204AFN-M10 MS2050	0.14	0.0080	0.0085	0.013
M2	SEEX1204AFN-M10 MS2050	0.14	0.0070	0.0080	0.012
M3	SEEX1204AFN-M10 MS2050	0.12	0.0060	0.0065	0.0095
M4	SEEX1204AFN-M10 T350M	0.080	0.0050	0.0055	0.0085
M5	SEEX1204AFTN-M14 MM4500	0.080	0.0070	0.0080	0.012
K1	SEMX1204AFTN-M15 MK2050	0.14	0.012	0.013	0.020
K2	SEMX1204AFTN-M15 MK2050	0.14	0.011	0.012	0.018
K3	SEMX1204AFTN-M15 MK2050	0.14	0.011	0.012	0.018
K4	SEMX1204AFTN-M15 MK2050	0.14	0.011	0.012	0.018
K5	SEMX1204AFTN-M15 MK2050	0.14	0.0095	0.011	0.017
K6	SEMX1204AFTN-M15 MK2050	0.14	0.011	0.012	0.018
K7	SEMX1204AFTN-M15 T350M	0.14	0.0095	0.011	0.017
N1	SEEX1204AFN-E08 H25	0.14	0.0080	0.0085	0.013
N2	SEEX1204AFN-E08 H25	0.14	0.0080	0.0085	0.013
N3	SEEX1204AFN-E08 F40M	0.14	0.0080	0.0085	0.013
N11	SEEX1204AFN-E08 H25	0.14	0.0080	0.0085	0.013
S1	SEEX1204AFTN-ME11 T350M	0.080	0.0055	0.0060	0.0095
S2	SEEX1204AFTN-ME11 T350M	0.080	0.0055	0.0060	0.0095
S3	SEEX1204AFTN-ME11 T350M	0.080	0.0050	0.0055	0.0085
S11	SEEX1204AFN-M10 MS2050	0.10	0.0060	0.0065	0.0095
S12	SEEX1204AFN-M10 MS2050	0.10	0.0060	0.0065	0.0095
S13	SEEX1204AFN-M10 MS2050	0.080	0.0050	0.0055	0.0085
H5	SEMX1204AFTN-MD19 MP1500	0.12	0.0085	0.0095	0.015
H8	SEMX1204AFTN-MD19 MP1500	0.10	0.0065	0.0075	0.011
H11	SEMX1204AFTN-MD19 MP1500	0.12	0.0085	0.0095	0.015
H12	SEMX1204AFTN-MD19 MP1500	0.12	0.0085	0.0095	0.015
H21	SEMX1204AFTN-MD19 MP1500	0.10	0.0065	0.0075	0.011

SMG = Seco Material Group

 $f_z$  = in/tooth $a_p$  = inch $v_c$  = sf/min $a_d/D_c$  = %

All cutting data are start values.

# QUATTROMILL CLOSE PITCH

R220.53-12 - Cutting data  $v_c =$  (sf/min)

SMG	MP1020			MP1500			MP2500			MP3000			T350M			F40M		
	100%	30%	10%	100%	30%	10%	100%	30%	10%	100%	30%	10%	100%	30%	10%	100%	30%	10%
P1	740	1025	1175	980	1350	1575	870	1175	1400	740	1000	1200	760	1025	1225	660	900	1075
P2	720	990	1100	950	1275	1550	850	1125	1375	720	970	1175	740	990	1200	640	860	1025
P3	680	850	1025	840	1125	1350	740	990	1200	630	850	1000	650	870	1025	560	750	900
P4	600	800	900	740	1000	1175	650	890	1050	550	760	910	570	780	910	495	680	790
P5	570	770	860	710	960	1150	630	850	1025	530	730	870	540	740	880	475	650	770
P6	640	860	1000	790	1075	1275	700	960	1125	610	820	970	610	830	990	530	730	860
P7	610	810	950	750	1025	1200	660	900	1075	570	770	920	580	790	940	500	680	810
P8	570	720	860	710	940	1125	630	840	1000	530	710	840	540	730	870	475	630	760
P11	590	790	920	730	990	1175	640	880	1050	560	750	890	560	760	910	485	660	790
M1	-	-	-	-	-	-	610	820	980	540	730	870	570	760	920	520	690	830
M2	-	-	-	-	-	-	500	690	820	440	610	720	470	640	760	425	580	690
M3	-	-	-	-	-	-	410	560	670	365	500	590	385	520	620	350	470	570
M4	-	-	-	-	-	-	320	425	520	280	380	460	300	395	480	275	360	440
M5	-	-	-	-	-	-	270	355	430	235	315	385	250	330	400	225	300	365
K1	-	-	-	760	1025	1225	670	900	1075	570	770	920	580	780	940	510	680	820
K2	-	-	-	670	910	1075	590	810	960	500	690	820	520	710	840	450	610	730
K3	-	-	-	570	770	920	500	680	810	425	580	690	435	600	710	380	520	620
K4	-	-	-	540	740	880	480	650	780	405	560	660	420	570	680	365	495	590
K5	-	-	-	340	450	540	300	395	475	250	345	405	260	345	415	225	300	360
K6	-	-	-	475	650	770	420	580	680	355	490	580	370	500	600	320	435	520
K7	-	-	-	435	570	690	385	510	610	320	440	520	335	445	530	290	385	460
N1	-	-	-	-	-	-	2450	3325	3925	2075	2825	3300	-	-	-	1850	2500	2975
N2	-	-	-	-	-	-	1975	2675	3175	1675	2275	2675	-	-	-	1500	2025	2400
N3	-	-	-	-	-	-	1325	1775	2125	1100	1525	1775	-	-	-	1000	1350	1600
N11	-	-	-	-	-	-	1500	2050	2425	1275	1725	2050	-	-	-	1150	1550	1825
S1	-	-	-	-	-	-	155	205	250	130	175	215	140	185	225	125	170	205
S2	-	-	-	-	-	-	125	165	205	105	140	175	115	150	180	105	135	165
S3	-	-	-	-	-	-	110	145	180	95	125	150	100	130	160	90	120	145
S11	-	-	-	-	-	-	215	290	350	185	250	300	195	260	315	175	235	285
S12	-	-	-	-	-	-	125	170	205	105	145	170	110	150	180	100	135	165
S13	-	-	-	-	-	-	100	135	160	85	115	140	90	120	145	80	110	130
H5	-	-	-	160	220	255	130	175	205	115	155	185	125	170	200	105	145	170
H8	-	-	-	175	230	275	140	185	220	125	165	200	135	175	215	115	155	185
H11	-	-	-	205	275	325	165	225	260	145	195	230	155	215	250	135	185	220
H12	-	-	-	305	420	490	250	335	395	220	295	350	235	325	380	205	280	330
H21	-	-	-	175	230	275	140	185	220	125	165	200	135	175	215	115	155	185

# QUATTROMILL CLOSE PITCH

## R220.53-12 - Cutting data $v_c =$ (sf/min)

SMG	MM4500			MK1500			MK2050			H25		
	100%	30%	10%	100%	30%	10%	100%	30%	10%	100%	30%	10%
P1	530	730	860	-	-	-	850	1175	1375	-	-	-
P2	520	700	840	-	-	-	830	1125	1350	-	-	-
P3	455	610	730	-	-	-	730	980	1175	-	-	-
P4	400	550	640	-	-	-	640	880	1025	-	-	-
P5	385	520	620	-	-	-	620	840	1000	-	-	-
P6	430	590	700	-	-	-	690	940	1125	-	-	-
P7	405	550	660	-	-	-	650	890	1050	-	-	-
P8	385	510	610	-	-	-	620	820	990	-	-	-
P11	395	540	640	-	-	-	630	860	1025	-	-	-
M1	445	600	720	-	-	-	-	-	-	-	-	-
M2	370	500	600	-	-	-	-	-	-	-	-	-
M3	300	405	490	-	-	-	-	-	-	-	-	-
M4	235	310	380	-	-	-	-	-	-	-	-	-
M5	195	260	315	-	-	-	-	-	-	-	-	-
K1	-	-	-	950	1275	1525	900	1200	1450	-	-	-
K2	-	-	-	840	1150	1350	800	1075	1300	-	-	-
K3	-	-	-	710	970	1150	670	920	1100	-	-	-
K4	-	-	-	680	930	1100	640	880	1050	-	-	-
K5	-	-	-	425	560	670	400	530	640	-	-	-
K6	-	-	-	600	820	970	570	770	920	-	-	-
K7	-	-	-	540	720	860	510	680	820	-	-	-
N1	-	-	-	-	-	-	-	-	-	2425	3275	3875
N2	-	-	-	-	-	-	-	-	-	1950	2650	3125
N3	-	-	-	-	-	-	-	-	-	1300	1750	2075
N11	-	-	-	-	-	-	-	-	-	1500	2000	2375
S1	70	95	115	-	-	-	-	-	-	-	-	-
S2	60	75	95	-	-	-	-	-	-	-	-	-
S3	50	70	80	-	-	-	-	-	-	-	-	-
S11	100	135	160	-	-	-	-	-	-	140	190	225
S12	75	105	125	-	-	-	-	-	-	110	145	175
S13	60	80	100	-	-	-	-	-	-	-	-	-

## PCBN

## PCBN, Finishing

SMG	CH0550		CBN060K		CH2540		CH3515	
	$v_c$	f	$v_c$	f	$v_c$	f	$v_c$	f
K2	-	-	490 - 1150	0.002 - 0.009	395 - 1075	0.002 - 0.010	-	-
K5	-	-	-	-	260 - 1650	0.002 - 0.009	-	-
H3	330 - 980	0.001 - 0.010	330 - 790	0.001 - 0.011	330 - 720	0.001 - 0.010	295 - 720	0.002 - 0.010
H5	330 - 820	0.001 - 0.010	295 - 720	0.001 - 0.011	295 - 660	0.001 - 0.010	295 - 720	0.002 - 0.010
H7	360 - 750	0.002 - 0.008	330 - 750	0.002 - 0.008	330 - 690	0.002 - 0.009	330 - 690	0.002 - 0.009
H8	330 - 720	0.001 - 0.008	295 - 720	0.001 - 0.008	230 - 660	0.001 - 0.007	230 - 660	0.001 - 0.007
H11	360 - 750	0.001 - 0.007	330 - 750	0.001 - 0.007	260 - 690	0.001 - 0.007	-	-
H21	-	-	-	-	-	-	490 - 750	0.004 - 0.024
H31	-	-	-	-	-	-	165 - 395	0.006 - 0.018
PM1	-	-	-	-	360 - 820	0.002 - 0.010	425 - 980	0.002 - 0.010
PM2	-	-	-	-	295 - 660	0.002 - 0.008	395 - 820	0.002 - 0.008
PM3	-	-	-	-	260 - 560	0.002 - 0.006	330 - 660	0.002 - 0.006
HF1	-	-	-	-	165 - 490	0.001 - 0.007	-	-
HF2	-	-	-	-	330 - 660	0.001 - 0.007	-	-

## PCBN, Plunging

SMG	CH0550		CBN060K		CH2540	
	$v_c$	f	$v_c$	f	$v_c$	f
K2	-	-	490 - 1150	0.002 - 0.009	395 - 1075	0.002 - 0.010
K5	-	-	-	-	260 - 1650	0.002 - 0.009
H3	890 - 1475	0.001 - 0.004	890 - 1400	0.001 - 0.004	820 - 1375	0.001 - 0.004
H5	820 - 1375	0.001 - 0.004	820 - 1300	0.001 - 0.004	750 - 1275	0.001 - 0.004
H7	980 - 1650	0.001 - 0.003	980 - 1575	0.001 - 0.004	980 - 1550	0.001 - 0.004
H8	395 - 950	0.001 - 0.004	395 - 890	0.001 - 0.004	330 - 890	0.001 - 0.004
H11	360 - 750	0.001 - 0.007	330 - 750	0.001 - 0.007	260 - 690	0.001 - 0.007
H21	-	-	-	-	-	-
H31	-	-	-	-	-	-
PM1	-	-	-	-	360 - 820	0.002 - 0.010
PM2	-	-	-	-	490 - 820	0.001 - 0.005
PM3	-	-	-	-	330 - 660	0.001 - 0.005
HF1	-	-	-	-	165 - 490	0.001 - 0.007
HF2	-	-	-	-	330 - 660	0.001 - 0.007

SMG = Seco Material Group

 $v_c$  = sf/min

f = in/rev

All cutting data are start values

# SN200R, 400R, 500R

		SLOT MILLING											
ISO GROUP	SMG	$a_e \times D_c$ (max)	$v_c$ (sf / min)		Zn = 2								
					1/16	3/32	1/8	5/32	3/16	1/4	5/16	3/8	1/2
P	M/A/D 1 - 2	1.00	984	n [rev/min]	60157	40105	30079	24062	20052	15039	12031	10026	7520
				fz [in]	0.0021	0.0031	0.0041	0.0052	0.0062	0.0083	0.0103	0.0124	0.0165
		820	1148	vf [in/min]	248	248	248	248	248	248	248	248	248
	ap max.			0.0040	0.0060	0.0080	0.0100	0.0120	0.0140	0.0160	0.0180	0.0200	
	M/A/D 3 - 4	1.00	738	n [rev/min]	45118	30079	22559	18047	15039	11280	9024	7520	5640
				fz [in]	0.0019	0.0028	0.0038	0.0047	0.0056	0.0075	0.0094	0.0113	0.0150
		656	820	vf [in/min]	169	169	169	169	169	169	169	169	169
	ap max.			0.0040	0.0060	0.0080	0.0100	0.0120	0.0140	0.0160	0.0180	0.0200	
	M/A/D 5 - 6	1.00	574	n [rev/min]	35092	23395	17546	14036	11697	8773	7018	5849	4386
fz [in]				0.0017	0.0025	0.0034	0.0042	0.0051	0.0068	0.0084	0.0101	0.0135	
492		656	vf [in/min]	118	118	118	118	118	118	118	118	118	
	ap max.		0.0040	0.0060	0.0080	0.0100	0.0120	0.0140	0.0160	0.0180	0.0200		
P	M/A/D 7a	1.00	312	n [rev/min]	19050	12700	9525	7620	6350	4762	3810	3175	2381
				fz [in]	0.0015	0.0023	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090	0.0120
		262	361	vf [in/min]	57	57	57	57	57	57	57	57	57
ap max.	0.0032			0.0048	0.0064	0.0080	0.0096	0.0112	0.0128	0.0144	0.0160		
M	E/M/A 8 - 9	1.00	410	n [rev/min]	25066	16710	12533	10026	8355	6266	5013	4178	3133
				fz [in]	0.0015	0.0023	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090	0.0120
		361	459	vf [in/min]	75	75	75	75	75	75	75	75	75
	ap max.			0.0032	0.0048	0.0064	0.0080	0.0096	0.0112	0.0128	0.0144	0.0160	
	E/M/A 10 - 11	1.00	312	n [rev/min]	19050	12700	9525	7620	6350	4762	3810	3175	2381
				fz [in]	0.0015	0.0023	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090	0.0120
262		361	vf [in/min]	57	57	57	57	57	57	57	57		
	ap max.		0.0032	0.0048	0.0064	0.0080	0.0096	0.0112	0.0128	0.0144	0.0160		
K	E/M/A 12 - 13	1.00	574	n [rev/min]	35092	23395	17546	14036	11697	8773	7018	5849	4386
				fz [in]	0.0019	0.0028	0.0038	0.0047	0.0056	0.0075	0.0094	0.0113	0.0150
		492	656	vf [in/min]	132	132	132	132	132	132	132	132	
	ap max.			0.0040	0.0060	0.0080	0.0100	0.0120	0.0140	0.0160	0.0180	0.0200	
	E/M/A 14 - 15	1.00	410	n [rev/min]	25066	16710	12533	10026	8355	6266	5013	4178	3133
				fz [in]	0.0017	0.0025	0.0034	0.0042	0.0051	0.0068	0.0084	0.0101	0.0135
328		492	vf [in/min]	85	85	85	85	85	85	85	85		
	ap max.		0.0040	0.0060	0.0080	0.0100	0.0120	0.0140	0.0160	0.0180	0.0200		
S	E 19	1.00	164	n [rev/min]	10026	6684	5013	4010	3342	2507	2005	1671	1253
				fz [in]	0.0011	0.0017	0.0023	0.0028	0.0034	0.0045	0.0056	0.0068	0.0090
		131	197	vf [in/min]	23	23	23	23	23	23	23	23	
	ap max.			0.0020	0.0030	0.0040	0.0050	0.0060	0.0070	0.0080	0.0090	0.0100	
	E 20	1.00	164	n [rev/min]	10026	6684	5013	4010	3342	2507	2005	1671	1253
				fz [in]	0.0011	0.0017	0.0023	0.0028	0.0034	0.0045	0.0056	0.0068	0.0090
		131	197	vf [in/min]	23	23	23	23	23	23	23	23	
	ap max.			0.0020	0.0030	0.0040	0.0050	0.0060	0.0070	0.0080	0.0090	0.0100	
	E 21	1.00	98	n [rev/min]	6016	4010	3008	2406	2005	1504	1203	1003	752
				fz [in]	0.0011	0.0017	0.0023	0.0028	0.0034	0.0045	0.0056	0.0068	0.0090
		66	131	vf [in/min]	14	14	14	14	14	14	14	14	
	ap max.			0.0020	0.0030	0.0040	0.0050	0.0060	0.0070	0.0080	0.0090	0.0100	
E 22	1.00	377	n [rev/min]	23060	15374	11530	9224	7687	5765	4612	3843	2883	
			fz [in]	0.0011	0.0017	0.0023	0.0028	0.0034	0.0045	0.0056	0.0068	0.0090	
	328	427	vf [in/min]	52	52	52	52	52	52	52	52		
ap max.			0.0020	0.0030	0.0040	0.0050	0.0060	0.0070	0.0080	0.0090	0.0100		

# SN200R, 400R, 500R

		SLOT MILLING											
ISO GROUP	SMG	a <sub>e</sub> x Dc (max)	v <sub>c</sub> (sf / min)	Zn = 4						Zn = 5			
				1/8	5/32	3/16	1/4	5/16	3/8	1/2	3/8	1/2	
P	M/A/D 1 - 2	1.00	984	n [rev/min]	30079	24062	20052	15039	12031	10026	7520	10026	7520
				fz [in]	0.0041	0.0052	0.0062	0.0083	0.0103	0.0124	0.0165	0.0124	0.0165
			820	1148	vf [in/min]	496	496	496	496	496	496	496	620
	ap max.	0.0080			0.0100	0.0120	0.0140	0.0160	0.0180	0.0200	0.0180	0.0200	
	M/A/D 3 - 4	1.00	738	n [rev/min]	22559	18047	15039	11280	9024	7520	5640	7520	5640
				fz [in]	0.0038	0.0047	0.0056	0.0075	0.0094	0.0113	0.0150	0.0113	0.0150
			656	820	vf [in/min]	338	338	338	338	338	338	338	423
	ap max.	0.0080			0.0100	0.0120	0.0140	0.0160	0.0180	0.0200	0.0180	0.0200	
	M/A/D 5 - 6	1.00	574	n [rev/min]	17546	14036	11697	8773	7018	5849	4386	5849	4386
fz [in]				0.0034	0.0042	0.0051	0.0068	0.0084	0.0101	0.0135	0.0101	0.0135	
492			656	vf [in/min]	237	237	237	237	237	237	237	296	296
	ap max.	0.0080		0.0100	0.0120	0.0140	0.0160	0.0180	0.0200	0.0180	0.0200		
P	M/A/D 7a	1.00	312	n [rev/min]	9525	7620	6350	4762	3810	3175	2381	3175	2381
				fz [in]	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090	0.0120	0.0090	0.0120
			262	361	vf [in/min]	114	114	114	114	114	114	114	143
ap max.	0.0064	0.0080			0.0096	0.0012	0.0128	0.0144	0.0160	0.0144	0.0160		
M	E/M/A 8 - 9	1.00	410	n [rev/min]	12533	10026	8355	6266	5013	4178	3133	4178	3133
				fz [in]	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090	0.0120	0.0090	0.0120
			361	459	vf [in/min]	150	150	150	150	150	150	150	188
	ap max.	0.0064			0.0080	0.0096	0.0012	0.0128	0.0144	0.0160	0.0144	0.0160	
	E/M/A 10 - 11	1.00	312	n [rev/min]	9525	7620	6350	4762	3810	3175	2381	3175	2381
				fz [in]	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090	0.0120	0.0090	0.0120
262			361	vf [in/min]	114	114	114	114	114	114	114	143	143
	ap max.	0.0064		0.0080	0.0096	0.0012	0.0128	0.0144	0.0160	0.0144	0.0160		
K	E/M/A 12 - 13	1.00	574	n [rev/min]	17546	14036	11697	8773	7018	5849	4386	5849	4386
				fz [in]	0.0038	0.0047	0.0056	0.0075	0.0094	0.0113	0.0150	0.0113	0.0150
			492	656	vf [in/min]	263	263	263	263	263	263	263	329
	ap max.	0.0080			0.0100	0.0120	0.0140	0.0160	0.0180	0.0200	0.0180	0.0200	
	E/M/A 14 - 15	1.00	410	n [rev/min]	12533	10026	8355	6266	5013	4178	3133	4178	3133
				fz [in]	0.0034	0.0042	0.0051	0.0068	0.0084	0.0101	0.0135	0.0101	0.0135
328			492	vf [in/min]	169	169	169	169	169	169	169	211	211
	ap max.	0.0080		0.0100	0.0120	0.0140	0.0160	0.0180	0.0200	0.0180	0.0200		
S	E 19	1.00	164	n [rev/min]	5013	4010	3342	2507	2005	1671	1253	1671	1253
				fz [in]	0.0023	0.0028	0.0034	0.0045	0.0056	0.0068	0.0090	0.0068	0.0090
			131	197	vf [in/min]	45	45	45	45	45	45	45	56
	ap max.	0.0040			0.0050	0.0060	0.0070	0.0080	0.0090	0.0100	0.0090	0.0100	
	E 20	1.00	164	n [rev/min]	5013	4010	3342	2507	2005	1671	1253	1671	1253
				fz [in]	0.0023	0.0028	0.0034	0.0045	0.0056	0.0068	0.0090	0.0068	0.0090
			131	197	vf [in/min]	45	45	45	45	45	45	45	56
	ap max.	0.0040			0.0050	0.0060	0.0070	0.0080	0.0090	0.0100	0.0090	0.0100	
	E 21	1.00	98	n [rev/min]	3008	2406	2005	1504	1203	1003	752	1003	752
				fz [in]	0.0023	0.0028	0.0034	0.0045	0.0056	0.0068	0.0090	0.0068	0.0090
			66	131	vf [in/min]	27	27	27	27	27	27	27	34
	ap max.	0.0040			0.0050	0.0060	0.0070	0.0080	0.0090	0.0100	0.0090	0.0100	
E 22	1.00	377	n [rev/min]	11530	9224	7687	5765	4612	3843	2883	3843	2883	
			fz [in]	0.0023	0.0028	0.0034	0.0045	0.0056	0.0068	0.0090	0.0068	0.0090	
		328	427	vf [in/min]	104	104	104	104	104	104	104	130	130
ap max.	0.0040			0.0050	0.0060	0.0070	0.0080	0.0090	0.0100	0.0090	0.0100		

# SN200R, 400R, 500R

ISO GROUP	SMG	x Dc <sup>2</sup>	v <sub>c</sub> (sf / min)	SIDE MILLING										
					Zn = 2									
					1/16	3/32	1/8	5/32	3/16	1/4	5/16	3/8	1/2	
P	M/A/D 1 - 2	0.30	984	n [rev/min]	60157	40105	30079	24062	20052	15039	12031	10026	7520	
				fz [in]	0.0034	0.0052	0.0069	0.0086	0.0103	0.0138	0.0172	0.0206	0.0275	
			820	1148	vf [in/min]	414	414	414	414	414	414	414	414	414
	ap max.	0.0040			0.0060	0.0080	0.0100	0.0120	0.0140	0.0160	0.0180	0.0200		
	M/A/D 3 - 4	0.30	738	n [rev/min]	45118	30079	22559	18047	15039	11280	9024	7520	5640	
				fz [in]	0.0031	0.0047	0.0063	0.0078	0.0094	0.0125	0.0156	0.0188	0.0250	
			656	820	vf [in/min]	282	282	282	282	282	282	282	282	282
	ap max.	0.0040			0.0060	0.0080	0.0100	0.0120	0.0140	0.0160	0.0180	0.0200		
	M/A/D 5 - 6	0.30	574	n [rev/min]	35092	23395	17546	14036	11697	8773	7018	5849	4386	
fz [in]				0.0028	0.0042	0.0056	0.0070	0.0084	0.0113	0.0141	0.0169	0.0225		
492			656	vf [in/min]	197	197	197	197	197	197	197	197	197	
	ap max.	0.0040		0.0060	0.0080	0.0100	0.0120	0.0140	0.0160	0.0180	0.0200			
P	M/A/D 7a	0.30	312	n [rev/min]	19050	12700	9525	7620	6350	4762	3810	3175	2381	
				fz [in]	0.0025	0.0038	0.0050	0.0063	0.0075	0.0100	0.0125	0.0150	0.0200	
			262	361	vf [in/min]	95	95	95	95	95	95	95	95	95
ap max.	0.0032	0.0048			0.0064	0.0080	0.0096	0.0112	0.0128	0.0144	0.0160			
M	E/M/A 8 - 9	0.30	410	n [rev/min]	25066	16710	12533	10026	8355	6266	5013	4178	3133	
				fz [in]	0.0025	0.0038	0.0050	0.0063	0.0075	0.0100	0.0125	0.0150	0.0200	
			361	459	vf [in/min]	125	125	125	125	125	125	125	125	125
	ap max.	0.0032			0.0048	0.0064	0.0080	0.0096	0.0112	0.0128	0.0144	0.0160		
	E/M/A 10 - 11	0.30	459	n [rev/min]	28073	18716	14037	11229	9358	7018	5615	4679	3509	
				fz [in]	0.0025	0.0038	0.0050	0.0063	0.0075	0.0100	0.0125	0.0150	0.0200	
262			361	vf [in/min]	140	140	140	140	140	140	140	140	140	
	ap max.	0.0032		0.0048	0.0064	0.0080	0.0096	0.0112	0.0128	0.0144	0.0160			
K	E/M/A 12 - 13	0.30	574	n [rev/min]	35092	23395	17546	14036	11697	8773	7018	5849	4386	
				fz [in]	0.0025	0.0038	0.0050	0.0063	0.0075	0.0100	0.0125	0.0150	0.0200	
			492	656	vf [in/min]	175	175	175	175	175	175	175	175	175
	ap max.	0.0040			0.0060	0.0080	0.0100	0.0120	0.0140	0.0160	0.0180	0.0200		
	E/M/A 14 - 15	0.30	410	n [rev/min]	25066	16710	12533	10026	8355	6266	5013	4178	3133	
				fz [in]	0.0019	0.0028	0.0038	0.0047	0.0056	0.0075	0.0094	0.0113	0.0150	
328			492	vf [in/min]	94	94	94	94	94	94	94	94	94	
	ap max.	0.0040		0.0060	0.0080	0.0100	0.0120	0.0140	0.0160	0.0180	0.0200			
S	E 19	0.30	164	n [rev/min]	10026	6684	5013	4010	3342	2507	2005	1671	1253	
				fz [in]	0.0015	0.0023	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090	0.0120	
			131	197	vf [in/min]	30	30	30	30	30	30	30	30	30
	ap max.	0.0020			0.0030	0.0040	0.0050	0.0060	0.0070	0.0080	0.0090	0.0100		
	E 20	0.30	164	n [rev/min]	10026	6684	5013	4010	3342	2507	2005	1671	1253	
				fz [in]	0.0015	0.0023	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090	0.0120	
			131	197	vf [in/min]	30	30	30	30	30	30	30	30	30
	ap max.	0.0020			0.0030	0.0040	0.0050	0.0060	0.0070	0.0080	0.0090	0.0100		
	E 21	0.30	98	n [rev/min]	6016	4010	3008	2406	2005	1504	1203	1003	752	
				fz [in]	0.0015	0.0023	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090	0.0120	
			66	131	vf [in/min]	18	18	18	18	18	18	18	18	18
	ap max.	0.0020			0.0030	0.0040	0.0050	0.0060	0.0070	0.0080	0.0090	0.0100		
E 22	0.30	377	n [rev/min]	23060	15374	11530	9224	7687	5765	4612	3843	2883		
			fz [in]	0.0022	0.0033	0.0044	0.0055	0.0066	0.0088	0.0109	0.0131	0.0175		
		328	427	vf [in/min]	101	101	101	101	101	101	101	101	101	
ap max.	0.0020			0.0030	0.0040	0.0050	0.0060	0.0070	0.0080	0.0090	0.0100			

# SN200R, 400R, 500R

ISO GROUP	SMG	x Dc <sup>2</sup>	v <sub>c</sub> (sf / min)	SIDE MILLING											
				Zn = 4				Zn = 5							
				1/8	5/32	3/16	1/4	5/16	3/8	1/2	3/8	1/2			
P	M/A/D 1 - 2	0.30	984	n [rev/min]	30079	24062	20052	15039	12031	10026	7520	10026	7520		
				fz [in]	0.0069	0.0086	0.0103	0.0138	0.0172	0.0206	0.0275	0.0206	0.0275		
			820	1148	vf [in/min]	827	827	827	827	827	827	827	1034	1034	
					ap max.	0.0080	0.0100	0.0120	0.0140	0.0160	0.0180	0.0200	0.0180	0.0200	
			738	820	n [rev/min]	22559	18047	15039	11280	9024	7520	5640	7520	5640	
					fz [in]	0.0063	0.0078	0.0094	0.0125	0.0156	0.0188	0.0250	0.0188	0.0250	
	M/A/D 3 - 4	0.30	656	820	vf [in/min]	564	564	564	564	564	564	564	705	705	
					ap max.	0.0080	0.0100	0.0120	0.0140	0.0160	0.0180	0.0200	0.0180	0.0200	
			574	656	n [rev/min]	17546	14036	11697	8773	7018	5849	4386	5849	4386	
					fz [in]	0.0056	0.0070	0.0084	0.0113	0.0141	0.0169	0.0225	0.0169	0.0225	
			492	656	vf [in/min]	395	395	395	395	395	395	395	395	493	493
					ap max.	0.0080	0.0100	0.0120	0.0140	0.0160	0.0180	0.0200	0.0180	0.0200	
312	361	n [rev/min]	9525	7620	6350	4762	3810	3175	2381	3175	2381				
		fz [in]	0.0050	0.0063	0.0075	0.0100	0.0125	0.0150	0.0200	0.0150	0.0200				
P	M/A/D 7a	0.30	262	361	vf [in/min]	190	190	190	190	190	190	190	238	238	
					ap max.	0.0064	0.0080	0.0096	0.0012	0.0128	0.0144	0.0160	0.0144	0.0160	
M	E/M/A 8 - 9	0.30	410	459	n [rev/min]	12533	10026	8355	6266	5013	4178	3133	4178	3133	
					fz [in]	0.0050	0.0063	0.0075	0.0100	0.0125	0.0150	0.0200	0.0150	0.0200	
			361	459	vf [in/min]	251	251	251	251	251	251	251	313	313	
	ap max.	0.0064			0.0080	0.0096	0.0012	0.0128	0.0144	0.0160	0.0144	0.0160			
	E/M/A 10 - 11	0.30	459	361	n [rev/min]	14037	11229	9358	7018	5615	4679	3509	4679	3509	
					fz [in]	0.0050	0.0063	0.0075	0.0100	0.0125	0.0150	0.0200	0.0150	0.0200	
262			361	vf [in/min]	281	281	281	281	281	281	281	351	351		
	ap max.	0.0064		0.0080	0.0096	0.0012	0.0128	0.0144	0.0160	0.0144	0.0160				
K	E/M/A 12 - 13	0.30	574	656	n [rev/min]	17546	14036	11697	8773	7018	5849	4386	5849	4386	
					fz [in]	0.0050	0.0063	0.0075	0.0100	0.0125	0.0150	0.0200	0.0150	0.0200	
			492	656	vf [in/min]	351	351	351	351	351	351	351	439	439	
	ap max.	0.0080			0.0100	0.0120	0.0140	0.0160	0.0180	0.0200	0.0180	0.0200			
	E/M/A 14 - 15	0.30	410	492	n [rev/min]	12533	10026	8355	6266	5013	4178	3133	4178	3133	
					fz [in]	0.0038	0.0047	0.0056	0.0075	0.0094	0.0113	0.0150	0.0113	0.0150	
328			492	vf [in/min]	188	188	188	188	188	188	188	235	235		
	ap max.	0.0080		0.0100	0.0120	0.0140	0.0160	0.0180	0.0200	0.0180	0.0200				
S	E 19	0.30	164	197	n [rev/min]	5013	4010	3342	2507	2005	1671	1253	1671	1253	
					fz [in]	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090	0.0120	0.0090	0.0120	
			131	197	vf [in/min]	60	60	60	60	60	60	60	75	75	
					ap max.	0.0040	0.0050	0.0060	0.0070	0.0080	0.0090	0.0100	0.0090	0.0100	
	E 20	0.30	164	197	n [rev/min]	5013	4010	3342	2507	2005	1671	1253	1671	1253	
					fz [in]	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090	0.0120	0.0090	0.0120	
			131	197	vf [in/min]	60	60	60	60	60	60	60	75	75	
					ap max.	0.0040	0.0050	0.0060	0.0070	0.0080	0.0090	0.0100	0.0090	0.0100	
	E 21	0.30	98	131	n [rev/min]	3008	2406	2005	1504	1203	1003	752	1003	752	
					fz [in]	0.0030	0.0038	0.0045	0.0060	0.0075	0.0090	0.0120	0.0090	0.0120	
			66	131	vf [in/min]	36	36	36	36	36	36	36	45	45	
					ap max.	0.0040	0.0050	0.0060	0.0070	0.0080	0.0090	0.0100	0.0090	0.0100	
E 22	0.30	377	427	n [rev/min]	11530	9224	7687	5765	4612	3843	2883	3843	2883		
				fz [in]	0.0044	0.0055	0.0066	0.0088	0.0109	0.0131	0.0175	0.0131	0.0175		
		328	427	vf [in/min]	202	202	202	202	202	202	202	252	252		
				ap max.	0.0040	0.0050	0.0060	0.0070	0.0080	0.0090	0.0100	0.0090	0.0100		

# SN200R, 400R, 500R

		PLUNGE MILLING												
ISO GROUP	SMG	x Dc <sup>2</sup>	v <sub>c</sub> (sf / min)		Zn = 2									
					1/16	3/32	1/8	5/32	3/16	1/4	5/16	3/8	1/2	
P	M/A/D 1 - 2	0.30	699	n [rev/min]	42712	28475	21356	17084	14237	10678	8542	7119	5339	
				fz [in]	0.0006	0.0009	0.0013	0.0016	0.0019	0.0025	0.0031	0.0038	0.0050	
			576	822	vf [in/min]	53	53	53	53	53	53	53	53	53
	M/A/D 3 - 4	0.30	518	n [rev/min]	31683	21122	15841	12673	10561	7921	6337	5280	3960	
				fz [in]	0.0006	0.0009	0.0013	0.0016	0.0019	0.0025	0.0031	0.0038	0.0050	
			459	577	vf [in/min]	40	40	40	40	40	40	40	40	40
		M/A/D 5 - 6	0.30	410	n [rev/min]	25066	16710	12533	10026	8355	6266	5013	4178	3133
					fz [in]	0.0006	0.0009	0.0013	0.0016	0.0019	0.0025	0.0031	0.0038	0.0050
				361	459	vf [in/min]	31	31	31	31	31	31	31	31
P	M/A/D 7a	0.30	213	n [rev/min]	13034	8689	6517	5213	4345	3259	2607	2172	1629	
				fz [in]	0.0004	0.0007	0.0009	0.0011	0.0013	0.0018	0.0022	0.0026	0.0035	
			180	246	vf [in/min]	11	11	11	11	11	11	11	11	11
M	E/M/A 8 - 9	0.30	289	n [rev/min]	17646	11764	8823	7058	5882	4412	3529	2941	2206	
				fz [in]	0.0004	0.0007	0.0009	0.0011	0.0013	0.0018	0.0022	0.0026	0.0035	
			246	331	vf [in/min]	15	15	15	15	15	15	15	15	15
	E/M/A 10 - 11	0.30	246	n [rev/min]	15039	10026	7520	6016	5013	3760	3008	2507	1880	
				fz [in]	0.0004	0.0007	0.0009	0.0011	0.0013	0.0018	0.0022	0.0026	0.0035	
			180	246	vf [in/min]	13	13	13	13	13	13	13	13	13
K	E/M/A 12 - 13	0.30	410	n [rev/min]	25066	16710	12533	10026	8355	6266	5013	4178	3133	
				fz [in]	0.0004	0.0007	0.0009	0.0011	0.0013	0.0018	0.0022	0.0026	0.0035	
			361	459	vf [in/min]	22	22	22	22	22	22	22	22	22
	E/M/A 14 - 15	0.30	295	n [rev/min]	18047	12031	9024	7219	6016	4512	3609	3008	2256	
				fz [in]	0.0004	0.0006	0.0008	0.0009	0.0011	0.0015	0.0019	0.0023	0.0030	
			230	361	vf [in/min]	14	14	14	14	14	14	14	14	14
S	E 19	0.30	115	n [rev/min]	7018	4679	3509	2807	2339	1755	1404	1170	877	
				fz [in]	0.0004	0.0006	0.0008	0.0009	0.0011	0.0015	0.0019	0.0023	0.0030	
			98	131	vf [in/min]	5	5	5	5	5	5	5	5	
	E 20	0.30	115	n [rev/min]	7018	4679	3509	2807	2339	1755	1404	1170	877	
				fz [in]	0.0004	0.0006	0.0008	0.0009	0.0011	0.0015	0.0019	0.0023	0.0030	
			98	131	vf [in/min]	5	5	5	5	5	5	5	5	
		E 21	0.30	75	n [rev/min]	4612	3075	2306	1845	1537	1153	922	769	577
					fz [in]	0.0004	0.0006	0.0008	0.0009	0.0011	0.0015	0.0019	0.0023	0.0030
				49	102	vf [in/min]	3	3	3	3	3	3	3	3
	E 22	0.30	262	n [rev/min]	16042	10695	8021	6417	5347	4010	3208	2674	2005	
				fz [in]	0.0004	0.0007	0.0009	0.0011	0.0013	0.0018	0.0022	0.0026	0.0035	
			230	295	vf [in/min]	14	14	14	14	14	14	14	14	

\*E = Emulsion M = Mist spray A = Air \*\*Reduce ap 20% and Feed per tooth 15% when using 5 x D version

\*\*Reduce ap 40% and Feed per tooth 30% when using 7 x D version \*\*\*pd: plunge depth

# JABRO JS554

## Cutting data - JS554 Slotting

SMG		$a_p / D_c$	$f_z$										$v_c$
			3	4	5	6	8	10	12	16	20	25	
P1	M/A/D/E	1	0.018	0.024	0.03	0.036	0.048	0.06	0.07	0.095	0.12	0.15	180 (160 - 200)
P2	M/A/D/E	1	0.018	0.024	0.03	0.036	0.048	0.06	0.07	0.095	0.12	0.15	170 (150 - 190)
P3	M/A/D/E	1	0.018	0.024	0.03	0.036	0.048	0.06	0.07	0.095	0.12	0.15	160 (140 - 180)
P4	M/A/D/E	1	0.018	0.024	0.03	0.036	0.048	0.06	0.07	0.095	0.12	0.15	150 (130 - 170)
P5	M/A/D/E	1	0.018	0.024	0.03	0.036	0.048	0.06	0.07	0.095	0.12	0.15	140 (100 - 160)
P6	M/A/D/E	1	0.018	0.024	0.03	0.036	0.048	0.06	0.07	0.095	0.12	0.15	155 (110 - 180)
P7	M/A/D/E	1	0.018	0.024	0.03	0.036	0.048	0.06	0.07	0.095	0.12	0.15	150 (105 - 170)
P8	M/A/D/E	1	0.018	0.024	0.03	0.036	0.048	0.06	0.07	0.095	0.12	0.15	140 (100 - 160)
P11	M/A/D/E	1	0.018	0.024	0.03	0.036	0.048	0.06	0.07	0.095	0.12	0.15	145 (105 - 165)
M1	E	0.8	0.012	0.016	0.02	0.024	0.032	0.04	0.048	0.065	0.08	0.1	80 (70 - 90)
M2	E	0.8	0.012	0.016	0.02	0.024	0.032	0.04	0.048	0.065	0.08	0.1	65 (55 - 75)
M3	E	0.6	0.0095	0.013	0.016	0.019	0.026	0.032	0.038	0.05	0.065	0.08	50 (40 - 60)
M4	E	0.44	0.0095	0.013	0.016	0.019	0.026	0.032	0.038	0.05	0.065	0.08	37 (30 - 45)
M5	E	0.44	0.0095	0.013	0.016	0.019	0.026	0.032	0.038	0.05	0.065	0.08	31 (25 - 37)
K1	E	1	0.015	0.02	0.026	0.03	0.04	0.05	0.06	0.08	0.1	0.13	160 (140 - 180)
K2	E	1	0.015	0.02	0.026	0.03	0.04	0.05	0.06	0.08	0.1	0.13	140 (120 - 155)
K3	E	1	0.015	0.02	0.026	0.03	0.04	0.05	0.06	0.08	0.1	0.13	115 (105 - 130)
K4	E	1	0.015	0.02	0.026	0.03	0.04	0.05	0.06	0.08	0.1	0.13	110 (100 - 125)
K5	E	0.7	0.015	0.02	0.026	0.03	0.04	0.05	0.06	0.08	0.1	0.13	140 (120 - 160)
K6	E	0.7	0.015	0.02	0.026	0.03	0.04	0.05	0.06	0.08	0.1	0.13	160 (140 - 180)
K7	E	0.7	0.015	0.02	0.026	0.03	0.04	0.05	0.06	0.08	0.1	0.13	160 (140 - 180)
N1	E	0.5	0.015	0.02	0.026	0.03	0.04	0.05	0.06	0.08	0.1	0.13	620 (520 - 730)
N2	E	0.5	0.015	0.02	0.026	0.03	0.04	0.05	0.06	0.08	0.1	0.13	350 (295 - 410)
N11	E	0.6	0.018	0.024	0.03	0.036	0.048	0.06	0.07	0.095	0.12	0.15	300 (250 - 350)
S1	E	0.3	0.0095	0.013	0.016	0.019	0.026	0.032	0.038	0.05	0.065	0.08	40 (30 - 50)
S2	E	0.3	0.0095	0.013	0.016	0.019	0.026	0.032	0.038	0.05	0.065	0.08	32 (24 - 40)
S3	E	0.3	0.0095	0.013	0.016	0.019	0.026	0.032	0.038	0.05	0.065	0.08	25 (15 - 35)
S11	E	0.5	0.012	0.016	0.02	0.024	0.032	0.04	0.05	0.065	0.08	0.1	85 (60 - 110)
S12	E	0.5	0.012	0.016	0.02	0.024	0.032	0.04	0.05	0.065	0.08	0.1	65 (48 - 85)
S13	E	0.44	0.012	0.016	0.02	0.024	0.032	0.04	0.05	0.065	0.08	0.1	50 (37 - 65)
H5	M/A/D	0.44	0.0075	0.01	0.012	0.015	0.02	0.024	0.028	0.036	0.042	0.05	49 (39 - 60)
H8	M/A/D	0.4	0.006	0.008	0.01	0.012	0.016	0.02	0.024	0.032	0.04	0.05	50 (41 - 60)
H11	M/A/D	0.44	0.0075	0.01	0.012	0.015	0.02	0.024	0.028	0.036	0.042	0.05	65 (50 - 75)
H12	M/A/D	0.44	0.0075	0.01	0.012	0.015	0.02	0.024	0.028	0.036	0.042	0.05	95 (75 - 115)
H21	M/A/D	0.4	0.006	0.008	0.01	0.012	0.016	0.02	0.024	0.032	0.04	0.05	50 (41 - 60)
TS1	A	0.7	0.03	0.04	0.05	0.06	0.08	0.1	0.12	0.15	0.17	0.19	250 (150 - 350)
TP1	A	0.7	0.03	0.04	0.05	0.06	0.08	0.1	0.12	0.15	0.17	0.19	250 (150 - 350)
GR1	A	0.8	0.03	0.04	0.05	0.06	0.08	0.1	0.12	0.15	0.17	0.19	500 (400 - 600)

SMG = Seco material group

Coolant = A=air D=dry E=emulsion M=mist spray

$v_c$  = m/min

$f_z$  = mm

$a_p$  (mm)/ $D_c$  (mm)= factor

All cutting data are target values

# JABRO JS554

## Cutting data - JS554 Side milling roughing $a_p/D_c = 0.4$

SMG		$a_p / D_c$	$f_z$										$v_c$	
			3	4	5	6	8	10	12	16	20	25		
P1	M/A/D/E	1	0.03	0.04	0.05	0.06	0.08	0.1	0.12	0.15	0.17	0.19	200	(180 - 220)
P2	M/A/D/E	1	0.03	0.04	0.05	0.06	0.08	0.1	0.12	0.15	0.17	0.19	190	(165 - 210)
P3	M/A/D/E	1	0.028	0.038	0.048	0.055	0.075	0.095	0.11	0.14	0.16	0.18	180	(155 - 200)
P4	M/A/D/E	1	0.028	0.038	0.046	0.055	0.075	0.095	0.11	0.14	0.16	0.18	170	(145 - 190)
P5	M/A/D/E	1	0.028	0.036	0.046	0.055	0.075	0.09	0.11	0.13	0.16	0.18	160	(115 - 180)
P6	M/A/D/E	1	0.028	0.036	0.046	0.055	0.075	0.09	0.11	0.13	0.15	0.17	180	(130 - 205)
P7	M/A/D/E	1	0.028	0.036	0.046	0.055	0.075	0.09	0.11	0.13	0.15	0.17	170	(120 - 195)
P8	M/A/D/E	1	0.028	0.038	0.048	0.055	0.075	0.095	0.11	0.14	0.16	0.18	155	(110 - 180)
P11	M/A/D/E	1	0.028	0.036	0.046	0.055	0.075	0.09	0.11	0.13	0.15	0.17	165	(115 - 190)
M1	E	1	0.018	0.024	0.03	0.036	0.048	0.06	0.07	0.09	0.1	0.12	90	(80 - 105)
M2	E	1	0.017	0.022	0.028	0.034	0.044	0.055	0.065	0.08	0.095	0.11	75	(65 - 85)
M3	E	0.9	0.015	0.02	0.026	0.03	0.04	0.05	0.06	0.075	0.085	0.095	55	(45 - 70)
M4	E	0.7	0.013	0.018	0.022	0.026	0.036	0.044	0.055	0.065	0.075	0.085	44	(35 - 55)
M5	E	0.7	0.013	0.018	0.022	0.026	0.036	0.044	0.055	0.065	0.075	0.085	36	(29 - 44)
K1	E	1.2	0.024	0.032	0.04	0.048	0.065	0.08	0.095	0.12	0.14	0.16	180	(160 - 205)
K2	E	1.2	0.022	0.03	0.038	0.044	0.06	0.075	0.09	0.11	0.13	0.14	160	(140 - 180)
K3	E	1.2	0.022	0.03	0.038	0.044	0.06	0.075	0.09	0.11	0.13	0.14	135	(120 - 150)
K4	E	1.2	0.022	0.03	0.038	0.044	0.06	0.075	0.09	0.11	0.13	0.14	130	(110 - 145)
K5	E	1	0.024	0.032	0.04	0.048	0.065	0.08	0.095	0.12	0.14	0.16	160	(135 - 180)
K6	E	1	0.028	0.036	0.046	0.055	0.07	0.09	0.11	0.13	0.15	0.17	175	(155 - 195)
K7	E	1	0.024	0.032	0.04	0.048	0.065	0.08	0.095	0.12	0.14	0.16	180	(160 - 205)
N1	E	1	0.024	0.032	0.04	0.048	0.065	0.08	0.095	0.12	0.14	0.16	700	(580 - 820)
N2	E	1	0.024	0.032	0.04	0.048	0.065	0.08	0.095	0.12	0.14	0.16	395	(330 - 460)
N11	E	1.2	0.024	0.032	0.04	0.048	0.065	0.08	0.095	0.12	0.14	0.16	350	(290 - 410)
S11	E	0.7	0.018	0.024	0.03	0.036	0.048	0.06	0.07	0.09	0.1	0.12	100	(70 - 130)
S12	E	0.7	0.018	0.024	0.03	0.036	0.048	0.06	0.07	0.09	0.1	0.12	75	(55 - 100)
S13	E	0.6	0.016	0.022	0.026	0.032	0.042	0.055	0.065	0.08	0.09	0.1	60	(43 - 80)
TS1	A	1.1	0.03	0.04	0.05	0.06	0.08	0.1	0.12	0.15	0.17	0.2	315	(190 - 440)
TP1	A	1.1	0.03	0.04	0.05	0.06	0.08	0.1	0.12	0.15	0.17	0.2	315	(190 - 440)
GR1	A	1.2	0.03	0.04	0.05	0.06	0.08	0.1	0.12	0.15	0.17	0.2	630	(500 - 750)

SMG = Seco material group Coolant = A=air D=dry E=emulsion M=mist spray  $v_c$  = m/min  $f_z$  = mm  $a_p$  (mm)/ $D_c$  (mm)=factor  $a_e$  (mm)/ $D_c$  (mm)=factor All cutting data are target values

### Recalculation (all values are percentages of original (100%) cutting data.)

STRAIGHT	Use original standard version side rough cutting data then recalculate parameters!									Use original standard version slotting cutting data then recalculate parameters!						
	Slotting		Side Rough			Side Finish				Ramping		Helical		Drilling		
				$a_p$	$f_z$	$a_e$ (% of $D_c$ )	$f_z$	$a_p$	$v_c$	$a_p$	$f_z$	$a_p/360^\circ$ (% of $D_c$ )	hole $\phi$ ( $\geq$ % of $D_c$ )	$f_z$	$a_p$ (% of $D_c$ )	
										$\leq 30^\circ$ max ramping angle						
JS554 Standard (2) L (3)	100 40	100 60	100 38	100 105	100 200	110 110	3 3	53 53	150 250	100 50	100 50	100 60	3 3	130 130	X X	X X

# JABRO JHF980

## Cutting data - JHF980 Slotting

SMG		a <sub>p</sub> / D <sub>c1</sub>	f <sub>z</sub>										v <sub>c</sub>
			1	1.5	2	3	4	5	6	8	10	12	
P1	E/M/A	0.090	0.032	0.050	0.065	0.10	0.13	0.16	0.20	0.26	0.32	0.38	340 (300 - 375)
P2	E/M/A	0.090	0.034	0.050	0.065	0.10	0.13	0.17	0.20	0.26	0.34	0.40	325 (290 - 360)
P3	E/M/A	0.090	0.032	0.048	0.065	0.095	0.13	0.16	0.19	0.26	0.32	0.38	285 (250 - 315)
P4	E/M/A	0.090	0.030	0.046	0.060	0.095	0.12	0.15	0.19	0.24	0.30	0.36	255 (225 - 280)
P5	E/M/A	0.090	0.030	0.046	0.060	0.090	0.12	0.15	0.18	0.24	0.30	0.36	240 (215 - 270)
P6	E/M/A	0.090	0.030	0.046	0.060	0.090	0.12	0.15	0.18	0.24	0.30	0.36	270 (240 - 300)
P7	E/M/A	0.090	0.030	0.046	0.060	0.090	0.12	0.15	0.18	0.24	0.30	0.36	255 (230 - 285)
P8	E/M/A	0.090	0.032	0.048	0.065	0.095	0.13	0.16	0.19	0.26	0.32	0.38	240 (210 - 265)
P11	E/M/A	0.090	0.030	0.046	0.060	0.090	0.12	0.15	0.18	0.24	0.30	0.36	250 (220 - 275)
M1	E/M/A	0.065	0.024	0.038	0.050	0.075	0.10	0.12	0.15	0.20	0.24	0.30	175 (150 - 195)
M2	E/M/A	0.065	0.024	0.036	0.048	0.070	0.095	0.12	0.14	0.19	0.24	0.28	140 (125 - 155)
M3	E/M/A	0.065	0.019	0.028	0.038	0.060	0.075	0.095	0.12	0.15	0.19	0.22	110 (100 - 125)
M4	E/M/A	0.065	0.017	0.026	0.034	0.050	0.070	0.085	0.10	0.14	0.17	0.20	85 (75 - 95)
M5	E/M/A	0.065	0.017	0.026	0.034	0.050	0.070	0.085	0.10	0.14	0.17	0.20	70 (60 - 80)
K1	E/M/A	0.090	0.034	0.050	0.065	0.10	0.13	0.17	0.20	0.26	0.34	0.40	185 (155 - 210)
K2	E/M/A	0.090	0.030	0.046	0.060	0.090	0.12	0.15	0.18	0.24	0.30	0.36	165 (140 - 185)
K3	E/M/A	0.090	0.030	0.046	0.060	0.090	0.12	0.15	0.18	0.24	0.30	0.36	140 (120 - 160)
K4	E/M/A	0.090	0.030	0.046	0.060	0.090	0.12	0.15	0.18	0.24	0.30	0.36	130 (115 - 150)
K5	E/M/A	0.090	0.028	0.040	0.055	0.080	0.11	0.14	0.16	0.22	0.28	0.32	80 (70 - 90)
K6	E/M/A	0.090	0.030	0.046	0.060	0.090	0.12	0.15	0.18	0.24	0.30	0.36	115 (100 - 135)
K7	E/M/A	0.090	0.028	0.040	0.055	0.080	0.11	0.14	0.16	0.22	0.28	0.32	100 (85 - 115)
S1	E	0.040	0.020	0.030	0.040	0.060	0.080	0.10	0.12	0.16	0.20	0.24	55 (44 - 65)
S2	E	0.040	0.020	0.030	0.040	0.060	0.080	0.10	0.12	0.16	0.20	0.24	55 (44 - 65)
S3	E	0.040	0.018	0.028	0.036	0.055	0.070	0.090	0.11	0.14	0.18	0.22	33 (22 - 44)
S11	E	0.040	0.018	0.028	0.036	0.055	0.070	0.090	0.11	0.14	0.18	0.22	165 (145 - 185)
S12	E	0.040	0.018	0.028	0.036	0.055	0.070	0.090	0.11	0.14	0.18	0.22	125 (110 - 145)
S13	E	0.040	0.016	0.024	0.032	0.048	0.065	0.080	0.095	0.13	0.16	0.19	100 (85 - 115)
H5	M/A/D	0.065	0.024	0.038	0.050	0.075	0.10	0.12	0.15	0.20	0.24	0.30	105 (90 - 125)
H8	M/A/D	0.065	0.024	0.034	0.046	0.070	0.095	0.12	0.14	0.19	0.24	0.28	105 (90 - 125)
H21	M/A/D	0.065	0.024	0.034	0.046	0.070	0.095	0.12	0.14	0.19	0.24	0.28	105 (90 - 125)
H31	M/A/D	0.065	0.020	0.030	0.040	0.060	0.080	0.10	0.12	0.16	0.20	0.24	85 (70 - 95)

SMG = Seco material group Coolant = A=air D=dry E=emulsion M=mist spray v<sub>c</sub> = m/min f<sub>z</sub> = mm a<sub>p</sub> (mm)/D<sub>c1</sub> (mm)= factor All cutting data are target values

# JABRO JHF980

## Cutting data - JHF980 Side milling $a_p/D_{c1} = 0,3$

SMG		$a_p / D_{c1}$	$f_z$										$v_c$
			1	1.5	2	3	4	5	6	8	10	12	
P1	E/M/A	0.090	0.036	0.055	0.070	0.10	0.14	0.18	0.20	0.28	0.36	0.42	495 (440 - 550)
P2	E/M/A	0.090	0.036	0.055	0.070	0.10	0.14	0.18	0.20	0.28	0.36	0.42	485 (430 - 540)
P3	E/M/A	0.090	0.034	0.050	0.070	0.10	0.14	0.17	0.20	0.28	0.34	0.42	420 (370 - 465)
P4	E/M/A	0.090	0.034	0.050	0.070	0.10	0.14	0.17	0.20	0.28	0.34	0.40	370 (330 - 410)
P5	E/M/A	0.090	0.034	0.050	0.065	0.10	0.13	0.17	0.20	0.26	0.34	0.40	350 (315 - 390)
P6	E/M/A	0.090	0.034	0.050	0.065	0.10	0.13	0.17	0.20	0.26	0.34	0.40	395 (350 - 440)
P7	E/M/A	0.090	0.034	0.050	0.065	0.10	0.13	0.17	0.20	0.26	0.34	0.40	375 (330 - 415)
P8	E/M/A	0.090	0.034	0.050	0.070	0.10	0.14	0.17	0.20	0.28	0.34	0.42	350 (315 - 390)
P11	E/M/A	0.090	0.034	0.050	0.065	0.10	0.13	0.17	0.20	0.26	0.34	0.40	360 (320 - 400)
M1	E/M/A	0.065	0.024	0.038	0.050	0.075	0.10	0.12	0.15	0.20	0.24	0.30	250 (220 - 280)
M2	E/M/A	0.065	0.024	0.038	0.050	0.075	0.10	0.12	0.15	0.20	0.24	0.30	205 (180 - 225)
M3	E/M/A	0.065	0.022	0.032	0.042	0.065	0.085	0.11	0.13	0.17	0.22	0.26	160 (140 - 175)
M4	E/M/A	0.065	0.019	0.028	0.038	0.055	0.075	0.095	0.11	0.15	0.19	0.22	120 (105 - 135)
M5	E/M/A	0.065	0.019	0.028	0.038	0.055	0.075	0.095	0.11	0.15	0.19	0.22	100 (90 - 115)
K1	E/M/A	0.090	0.036	0.055	0.070	0.10	0.14	0.18	0.20	0.28	0.36	0.42	270 (235 - 310)
K2	E/M/A	0.090	0.034	0.050	0.065	0.10	0.13	0.17	0.20	0.26	0.34	0.40	235 (205 - 270)
K3	E/M/A	0.090	0.034	0.050	0.065	0.10	0.13	0.17	0.20	0.26	0.34	0.40	200 (170 - 230)
K4	E/M/A	0.090	0.034	0.050	0.065	0.10	0.13	0.17	0.20	0.26	0.34	0.40	190 (165 - 220)
K5	E/M/A	0.090	0.030	0.046	0.060	0.090	0.12	0.15	0.18	0.24	0.30	0.36	115 (100 - 135)
K6	E/M/A	0.090	0.034	0.050	0.065	0.10	0.13	0.17	0.20	0.26	0.34	0.40	170 (145 - 195)
K7	E/M/A	0.090	0.030	0.046	0.060	0.090	0.12	0.15	0.18	0.24	0.30	0.36	150 (130 - 170)
H5	M/A/D	0.065	0.024	0.038	0.050	0.075	0.10	0.12	0.15	0.20	0.24	0.30	155 (130 - 180)
H8	M/A/D	0.065	0.024	0.038	0.050	0.075	0.10	0.12	0.15	0.20	0.24	0.30	155 (130 - 180)
H21	M/A/D	0.065	0.024	0.038	0.050	0.075	0.10	0.12	0.15	0.20	0.24	0.30	155 (130 - 180)
H31	M/A/D	0.065	0.022	0.034	0.044	0.065	0.090	0.11	0.13	0.18	0.22	0.26	120 (100 - 135)

SMG = Seco material group Coolant = A=air D=dry E=emulsion M=mist spray  $v_c$ = m/min  $f_z$  = mm  $a_p$  (mm)/ $D_c$  (mm)= factor  $a_e$  (mm)/ $D_{c1}$  (mm)= factor All cutting data are target values

## Recalculation (all values are percentages of original (100%) cutting data.)

STRAIGHT	Use original standard version side rough cutting data then recalculate parameters!									Use original standard version slotting cutting data then recalculate parameters!								
	Slotting		Side Rough			Side Finish				Ramping		Helical			Plunging			
				$v_c$	$f_z$	$a_p$	$v_c$	$a_e$ (% of $D_c$ )	$f_z$	$a_p$		$f_z$	$f_z$	$a_p/360^\circ$ (% of $D_c$ )	hole $\phi$ ( $\geq$ % of $D_c$ )	$v_c$	$a_e$ (% of $D_c$ )	$f_z$
	$v_c$	$f_z$	$v_c$	$f_z$	$a_p$	$v_c$	$a_e$ (% of $D_c$ )	$f_z$	$a_p$	$\leq 1,5^\circ$ max ramping angle					$v_c$	$a_e$ (% of $D_c$ )	$f_z$	plunge depth (% of $D_{c1}$ )
JHF980 K+ Standard (1, 2)	100	100	100	100	100	X	X	X	X	100	100	100	3	130	70	30	33	200
ML (3)	80	85	80	85	80	X	X	X	X	80	85	85	3	130	70	30	33	200
TL (4)	50	70	50	70	60	X	X	X	X	60	70	70	3	130	70	30	33	200

## PRECIMASTER PLUS

## PM Plus...-EB45

SMG		$a_p$ on (Ø) inch		f (in/rev)		$V_c$ (sf/min)				
		z=6	z=8	z=6	z=8	H15	CP20	RX2000	CF	RX1500
P1	PMX5/PMX6-EB45	.004-.008	.004-.012	.012-.035	.016-.047	80 (50-100)	195 (100-330)	260 (100-490)	590 (295-655)	720 (395-985)
P2	PMX5/PMX6-EB45	.004-.008	.004-.012	.012-.035	.016-.047	80 (50-100)	195 (100-330)	260 (100-490)	590 (295-655)	720 (395-985)
P3	PMX5/PMX6-EB45	.004-.008	.004-.012	.012-.035	.016-.047	80 (50-100)	195 (100-330)	260 (100-490)	590 (295-655)	720 (395-985)
P4	PMX5/PMX6-EB45	.004-.008	.004-.012	.008-.028	.012-.039	65 (35-80)	165 (100-260)	195 (100-395)	395 (260-490)	590 (295-655)
P5	PMX5/PMX6-EB45	.004-.008	.004-.012	.008-.028	.012-.039	65 (35-80)	165 (100-260)	195 (100-395)	395 (260-490)	590 (295-655)
P6	PMX5/PMX6-EB45	.004-.008	.004-.012	.008-.028	.012-.039	65 (35-80)	165 (100-260)	195 (100-395)	395 (260-490)	590 (295-655)
P7	PMX5/PMX6-EB45	.004-.008	.004-.012	.008-.028	.012-.039	65 (35-80)	165 (100-260)	195 (100-395)	395 (260-490)	590 (295-655)
P8	PMX5/PMX6-EB45	.004-.008	.004-.012	.008-.028	.012-.039	50 (35-65)	115 (65-195)	130 (65-260)	260 (195-395)	395 (260-590)
P11	PMX5/PMX6-EB45	.004-.008	.004-.012	.008-.028	.012-.039	50 (35-65)	115 (65-195)	130 (65-260)	260 (195-395)	395 (260-590)
M1	PMX5/PMX6-EB45	.003-.006	.004-.008	.008-.024	.012-.031	40 (30-50)	80 (50-130)	115 (65-230)	-	-
M2	PMX5/PMX6-EB45	.003-.006	.004-.008	.008-.024	.012-.031	-	80 (50-130)	115 (65-230)	-	-
M3	PMX5/PMX6-EB45	.003-.006	.004-.008	.008-.024	.012-.031	-	80 (50-130)	115 (65-230)	-	-
M4	PMX5/PMX6-EB45	.003-.006	.004-.008	.008-.024	.012-.031	-	65 (35-100)	80 (50-165)	-	-
M5	PMX5/PMX6-EB45	.003-.006	.004-.008	.008-.024	.012-.031	-	65 (35-100)	80 (50-165)	-	-
K1	PMX5/PMX6-EB45	.004-.008	.004-.010	.012-.035	.016-.047	80 (50-100)	195 (130-330)	260 (100-490)	-	720 (395-985)
K2	PMX5/PMX6-EB45	.004-.008	.004-.010	.012-.035	.016-.047	-	80 (65-130)	130 (100-230)	-	260 (165-330)
K3	PMX5/PMX6-EB45	.004-.008	.004-.010	.012-.035	.016-.047	80 (50-100)	195 (130-330)	260 (100-490)	-	720 (395-985)
K4	PMX5/PMX6-EB45	.004-.008	.004-.010	.012-.035	.016-.047	80 (50-100)	150 (100-230)	230 (130-395)	330 (230-490)	490 (260-655)
K5	PMX5/PMX6-EB45	.004-.008	.004-.010	.012-.035	.016-.047	80 (50-100)	150 (100-230)	230 (130-395)	330 (230-490)	490 (260-655)
K6	PMX5/PMX6-EB45	.004-.008	.004-.010	.012-.035	.016-.047	-	195 (130-330)	260 (100-490)	-	720 (395-985)
K7	PMX5/PMX6-EB45	.004-.008	.004-.010	.012-.035	.016-.047	-	195 (130-330)	260 (100-490)	-	720 (395-985)
N1	PMX5/PMX6-EB45	.004-.008	.004-.012	.012-.035	.016-.047	165 (100-330)	-	260 (100-490)	-	-
N2	PMX5/PMX6-EB45	.004-.008	.004-.012	.012-.035	.016-.047	165 (100-330)	-	260 (100-490)	-	-
N3	PMX5/PMX6-EB45	.004-.008	.004-.012	.012-.035	.016-.047	165 (100-330)	-	260 (100-490)	-	-
N11	PMX5/PMX6-EB45	.004-.008	.004-.012	.012-.035	.016-.047	165 (100-330)	-	260 (100-490)	-	-
S1	PMX5/PMX6-EB45	.003-.006	.004-.006	.008-.024	.012-.031	-	65 (35-80)	65 (35-80)	-	-
S2	PMX5/PMX6-EB45	.003-.006	.004-.006	.008-.024	.012-.031	-	65 (35-80)	65 (35-80)	-	-
S3	PMX5/PMX6-EB45	.003-.006	.004-.006	.008-.024	.012-.031	-	65 (35-80)	65 (35-80)	-	-
S11	PMX5/PMX6-EB45	.003-.006	.004-.006	.008-.024	.012-.031	65 (50-100)	100 (50-130)	130 (65-165)	-	-
S12	PMX5/PMX6-EB45	.003-.006	.004-.006	.008-.024	.012-.031	65 (50-100)	100 (50-130)	130 (65-165)	-	-
S13	PMX5/PMX6-EB45	.003-.006	.004-.006	.008-.024	.012-.031	65 (50-100)	100 (50-130)	130 (65-165)	-	-
H3	PMX5/PMX6-EB45	.003-.006	.004-.006	.008-.016	.012-.024	-	-	35 (25-50)	-	-
H5	PMX5/PMX6-EB45	.003-.006	.004-.006	.008-.016	.012-.024	-	-	35 (25-50)	-	-
H7	PMX5/PMX6-EB45	.003-.006	.004-.006	.008-.016	.012-.024	-	-	35 (25-50)	-	-
H8	PMX5/PMX6-EB45	.003-.006	.004-.006	.008-.016	.012-.024	-	-	35 (25-50)	-	-
H11	PMX5/PMX6-EB45	.003-.006	.004-.006	.008-.016	.012-.024	-	-	35 (25-50)	-	-
H12	PMX5/PMX6-EB45	.003-.006	.004-.006	.008-.016	.012-.024	-	-	35 (25-50)	-	-
H21	PMX5/PMX6-EB45	.003-.006	.004-.006	.008-.016	.012-.024	-	-	35 (25-50)	-	-
H31	PMX5/PMX6-EB45	.003-.006	.004-.006	.008-.016	.012-.024	-	-	35 (25-50)	-	-
PM1	PMX5/PMX6-EB45	.004-.008	.004-.012	.012-.035	.016-.047	-	165 (100-260)	230 (130-330)	-	-
PM2	PMX5/PMX6-EB45	.004-.008	.004-.012	.012-.035	.016-.047	-	165 (100-260)	230 (130-330)	-	-
PM3	PMX5/PMX6-EB45	.004-.008	.004-.012	.012-.035	.016-.047	-	165 (100-260)	230 (130-330)	-	-
TS1	PMX5/PMX6-EB45	.004-.006	.004-.008	.012-.035	.016-.047	65 (50-80)	-	130 (65-195)	-	-
TS2	PMX5/PMX6-EB45	.004-.006	.004-.008	.012-.035	.016-.047	65 (50-80)	-	130 (65-195)	-	-
TS3	PMX5/PMX6-EB45	.004-.006	.004-.008	.012-.035	.016-.047	65 (50-80)	-	130 (65-195)	-	-
TS4	PMX5/PMX6-EB45	.004-.006	.004-.008	.012-.035	.016-.047	65 (50-80)	-	130 (65-195)	-	-
TP1	PMX5/PMX6-EB45	.004-.006	.004-.008	.012-.035	.016-.047	65 (50-80)	-	130 (65-195)	-	-
TP2	PMX5/PMX6-EB45	.004-.006	.004-.008	.012-.035	.016-.047	65 (50-80)	-	130 (65-195)	-	-
TP3	PMX5/PMX6-EB45	.004-.006	.004-.008	.012-.035	.016-.047	65 (50-80)	-	130 (65-195)	-	-
TP4	PMX5/PMX6-EB45	.004-.006	.004-.008	.012-.035	.016-.047	65 (50-80)	-	130 (65-195)	-	-
GR1	PMX5/PMX6-EB45	.004-.012	.004-.016	.012-.035	.016-.047	130 (260-65)	-	195 (100-395)	-	-

SMG = Seco material group  $a_p$  = inch f = in/rev  $v_c$  = sf/min All cutting data are start values.

## PRECIMASTER PLUS

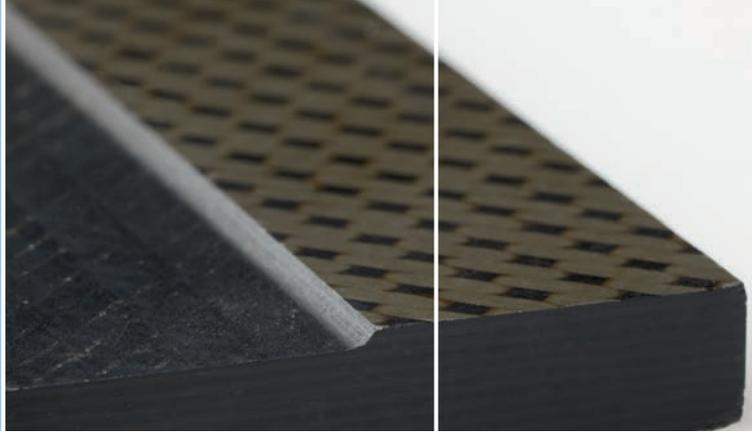
## PM Plus...-EB845

SMG		$a_p$ on ( $\beta$ ) inch		$f$ (in/rev)		$V_c$ (sf/min)				
		z=6	z=8	z=6	z=8	H15	CP20	RX2000	CF	RX1500
P3	PMX5/PMX6-EB845	.004-.008	.004-.012	.008-.035	.012-.047	-	195 (100-330)	260 (100-490)	590 (295-655)	720 (395-985)
P4	PMX5/PMX6-EB845	.004-.008	.004-.012	.008-.028	.012-.035	-	165 (100-260)	195 (100-395)	395 (260-490)	590 (295-655)
P5	PMX5/PMX6-EB845	.004-.008	.004-.012	.008-.028	.012-.035	65 (35-80)	165 (100-260)	195 (100-395)	395 (260-490)	590 (295-655)
P6	PMX5/PMX6-EB845	.004-.008	.004-.012	.008-.028	.012-.035	65 (35-80)	165 (100-260)	195 (100-395)	395 (260-490)	590 (295-655)
P7	PMX5/PMX6-EB845	.004-.008	.004-.012	.008-.028	.012-.035	65 (35-80)	165 (100-260)	195 (100-395)	395 (260-490)	590 (295-655)
P8	PMX5/PMX6-EB845	.004-.008	.004-.012	.008-.028	.012-.035	50 (35-65)	115 (65-195)	130 (65-260)	260 (195-395)	395 (260-590)
P11	PMX5/PMX6-EB845	.004-.008	.004-.012	.008-.028	.012-.035	50 (35-65)	115 (65-195)	130 (65-260)	260 (195-395)	395 (260-590)
M1	PMX5/PMX6-EB845	.003-.006	.004-.008	.008-.024	.012-.031	40 (30-50)	80 (50-130)	115 (65-230)	-	-
M2	PMX5/PMX6-EB845	.003-.006	.004-.008	.008-.024	.012-.031	-	80 (50-130)	115 (65-230)	-	-
M3	PMX5/PMX6-EB845	.003-.006	.004-.008	.008-.024	.012-.031	-	80 (50-130)	115 (65-230)	-	-
M4	PMX5/PMX6-EB845	.003-.006	.004-.008	.008-.024	.012-.031	-	65 (35-100)	80 (50-165)	-	-
M5	PMX5/PMX6-EB845	.003-.006	.004-.008	.008-.024	.012-.031	-	65 (35-100)	80 (50-165)	-	-
K1	PMX5/PMX6-EB845	.004-.008	.004-.010	.012-.035	.012-.047	80 (50-100)	195 (130-330)	260 (100-490)	-	720 (395-985)
K2	PMX5/PMX6-EB845	.004-.008	.004-.010	.012-.035	.012-.047	-	80 (65-130)	130 (100-230)	-	260 (165-330)
K3	PMX5/PMX6-EB845	.004-.008	.004-.010	.012-.035	.012-.047	80 (50-100)	195 (130-330)	260 (100-490)	-	720 (395-985)
K4	PMX5/PMX6-EB845	.004-.008	.004-.010	.012-.035	.012-.047	80 (50-100)	150 (100-230)	230 (130-395)	330 (230-490)	490 (260-655)
K5	PMX5/PMX6-EB845	.004-.008	.004-.010	.012-.035	.012-.047	80 (50-100)	150 (100-230)	230 (130-395)	330 (230-490)	490 (260-655)
K6	PMX5/PMX6-EB845	.004-.008	.004-.010	.012-.035	.012-.047	-	195 (130-330)	260 (100-490)	-	720 (395-985)
K7	PMX5/PMX6-EB845	.004-.008	.004-.010	.012-.035	.012-.047	-	195 (130-330)	260 (100-490)	-	720 (395-985)
S1	PMX5/PMX6-EB845	.003-.006	.004-.006	.008-.024	.012-.031	-	65 (35-80)	65 (35-80)	-	-
S2	PMX5/PMX6-EB845	.003-.006	.004-.006	.008-.024	.012-.031	-	65 (35-80)	65 (35-80)	-	-
S3	PMX5/PMX6-EB845	.003-.006	.004-.006	.008-.024	.012-.031	-	65 (35-80)	65 (35-80)	-	-
S11	PMX5/PMX6-EB845	.003-.006	.004-.006	.008-.024	.012-.031	65 (50-100)	100 (50-130)	130 (65-165)	-	-
S12	PMX5/PMX6-EB845	.003-.006	.004-.006	.008-.024	.012-.031	65 (50-100)	100 (50-130)	130 (65-165)	-	-
S13	PMX5/PMX6-EB845	.003-.006	.004-.006	.008-.024	.012-.031	65 (50-100)	100 (50-130)	130 (65-165)	-	-
H3	PMX5/PMX6-EB845	.003-.006	.004-.006	.008-.016	.012-.022	-	-	35 (25-50)	-	-
H5	PMX5/PMX6-EB845	.003-.006	.004-.006	.008-.016	.012-.022	-	-	35 (25-50)	-	-
H7	PMX5/PMX6-EB845	.003-.006	.004-.006	.008-.016	.012-.022	-	-	35 (25-50)	-	-
H8	PMX5/PMX6-EB845	.003-.006	.004-.006	.008-.016	.012-.022	-	-	35 (25-50)	-	-
H11	PMX5/PMX6-EB845	.003-.006	.004-.006	.008-.016	.012-.022	-	-	35 (25-50)	-	-
H12	PMX5/PMX6-EB845	.003-.006	.004-.006	.008-.016	.012-.022	-	-	35 (25-50)	-	-
H21	PMX5/PMX6-EB845	.003-.006	.004-.006	.008-.016	.012-.022	-	-	35 (25-50)	-	-
H31	PMX5/PMX6-EB845	.003-.006	.004-.006	.008-.016	.012-.022	-	-	35 (25-50)	-	-
PM1	PMX5/PMX6-EB845	.004-.008	.004-.012	.008-.024	.012-.031	-	165 (100-260)	230 (130-330)	-	-
PM2	PMX5/PMX6-EB845	.004-.008	.004-.012	.008-.024	.012-.031	-	165 (100-260)	230 (130-330)	-	-
PM3	PMX5/PMX6-EB845	.004-.008	.004-.012	.008-.024	.012-.031	-	165 (100-260)	230 (130-330)	-	-

## PM Plus...-EB25

SMG		$a_p$ on ( $\beta$ ) inch		$f$ (in/rev)		$V_c$ (sf/min)				
		z=6	z=8	z=6	z=8	H15	CP20	RX2000	CF	RX1500
P1	PMX5/PMX6-EB25	.004-.008	.004-.012	.031-.071	.039-.094	80 (50-100)	195 (100-330)	260 (100-490)	590 (295-655)	720 (395-985)
P2	PMX5/PMX6-EB25	.004-.008	.004-.012	.031-.071	.039-.094	80 (50-100)	195 (100-330)	260 (100-490)	590 (295-655)	720 (395-985)
P3	PMX5/PMX6-EB25	.004-.008	.004-.012	.031-.071	.039-.094	80 (50-100)	195 (100-330)	260 (100-490)	590 (295-655)	720 (395-985)
P4	PMX5/PMX6-EB25	.004-.008	.004-.012	.031-.071	.039-.094	65 (35-80)	165 (100-260)	195 (100-395)	395 (260-490)	590 (295-655)
P5	PMX5/PMX6-EB25	.004-.008	.004-.012	.031-.071	.039-.094	65 (35-80)	165 (100-260)	195 (100-395)	395 (260-490)	590 (295-655)
P6	PMX5/PMX6-EB25	.004-.008	.004-.012	.031-.071	.039-.094	65 (35-80)	165 (100-260)	195 (100-395)	395 (260-490)	590 (295-655)
P7	PMX5/PMX6-EB25	.004-.008	.004-.012	.031-.071	.039-.094	65 (35-80)	165 (100-260)	195 (100-395)	395 (260-490)	590 (295-655)
M1	PMX5/PMX6-EB25	.003-.006	.004-.008	.031-.047	.039-.079	-	80 (50-130)	115 (65-230)	-	-
K1	PMX5/PMX6-EB25	.004-.008	.004-.010	.031-.087	.039-.110	80 (50-100)	195 (130-330)	260 (100-490)	-	720 (395-985)
K2	PMX5/PMX6-EB25	.004-.008	.004-.010	.031-.071	.039-.094	-	80 (65-130)	130 (100-230)	-	260 (165-330)
K3	PMX5/PMX6-EB25	.004-.008	.004-.010	.031-.087	.039-.110	80 (50-100)	195 (130-330)	260 (100-490)	-	720 (395-985)
K4	PMX5/PMX6-EB25	.004-.008	.004-.010	.031-.087	.039-.110	80 (50-100)	150 (100-230)	230 (130-395)	330 (230-490)	490 (260-655)
K5	PMX5/PMX6-EB25	.004-.008	.004-.010	.031-.087	.039-.110	80 (50-100)	150 (100-230)	230 (130-395)	330 (230-490)	490 (260-655)
K6	PMX5/PMX6-EB25	.004-.008	.004-.010	.031-.071	.039-.094	-	195 (130-330)	260 (100-490)	-	720 (395-985)
K7	PMX5/PMX6-EB25	.004-.008	.004-.010	.031-.071	.039-.094	-	195 (130-330)	260 (100-490)	-	720 (395-985)
N1	PMX5/PMX6-EB25	.004-.008	.004-.012	.031-.087	.039-.110	165 (100-330)	-	-	-	-
N2	PMX5/PMX6-EB25	.004-.008	.004-.012	.031-.087	.039-.110	165 (100-330)	-	-	-	-
N3	PMX5/PMX6-EB25	.004-.008	.004-.012	.031-.087	.039-.110	165 (100-330)	-	-	-	-
N11	PMX5/PMX6-EB25	.004-.008	.004-.012	.031-.087	.039-.110	165 (100-330)	-	-	-	-
PM1	PMX5/PMX6-EB25	.004-.008	.004-.012	.020-.071	.031-.079	-	165 (100-260)	230 (130-330)	-	-
PM2	PMX5/PMX6-EB25	.004-.008	.004-.012	.020-.071	.031-.079	-	165 (100-260)	230 (130-330)	-	-
PM3	PMX5/PMX6-EB25	.004-.008	.004-.012	.020-.071	.031-.079	-	165 (100-260)	230 (130-330)	-	-

# SMG V2



## 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

**Free-cutting, austenitic and duplex stainless steels**

SMG	DESCRIPTION	PROPERTIES UTS = Ultimate tensile strength (ksi)	REFERENCE MATERIAL (ANSI)
M1	Free-cutting austenitic stainless steels	72.5 < UTS < 100	303
M2	Low alloy austenitic stainless steels	75 < UTS < 100	304
M3	Medium alloy austenitic stainless steels	90 < UTS < 140	316 L
M4	High alloy austenitic and duplex stainless steels	85 < UTS < 95	2205 Duplex
M5	Difficult high alloy austenitic and duplex stainless steels	100 < UTS < 120	2507 Super duplex

**Cast irons**

SMG	DESCRIPTION	PROPERTIES UTS = Ultimate tensile strength (ksi)	REFERENCE MATERIAL (ANSI)
K1	Grey cast irons (GCI)	20 < UTS < 40	A48 35 B
K2	Compacted graphite irons (CGI)	50 < UTS < 73	Grade 400-15
K3	Malleable cast irons (MCI)	60 < UTS < 70	A220 60004
K4	Nodular cast irons (SGI)	80 < UTS < 120	80-55-06
K5	Austempered ductile irons (ADI)	130 < UTS < 230	1050/700/7
K6	Austenitic lamellar cast irons	24 < UTS < 29	A436 Type 1 (Ni-Resist 1)
K7	Austenitic nodular cast irons	54 < UTS < 60	A439 Type D-2M (Ni-Resist D-2M)

**Non-ferrous metals**

SMG	DESCRIPTION	PROPERTIES UTS = Ultimate tensile strength (ksi)	REFERENCE MATERIAL (ANSI)
N1	Aluminum alloys, Si < 9%	30 < UTS < 90	7075-T6
N2	Aluminum alloys, 9% < Si < 16%	40 < UTS < 55	413.2 Si = 12%
N3	Aluminum alloys, Si > 16%	30 < UTS < 80	AlSi17Cu5
N11	Copper alloys	35 < UTS < 90	UNS C38500

**Superalloys and titanium**

SMG	DESCRIPTION	PROPERTIES UTS = Ultimate tensile strength (ksi)	REFERENCE MATERIAL (ANSI)
S1	Iron based superalloys	90 < UTS < 170	Discalloy
S2	Cobalt based superalloys	103 < UTS < 145	Stellite 21
S3	Nickel based superalloys	120 < UTS < 190	Inconel 718
S11	Titanium, low alloyed, ( $\alpha$ )	35 < UTS < 100	Ti
S12	Titanium, medium alloyed, ( $\alpha$ + $\beta$ )	108 < UTS < 160	TiAl6V4
S13	Titanium, high alloyed, (near $\beta$ and $\beta$ )	120 < UTS < 180	Ti10V2Fe3Al

**Hard materials**

SMG	DESCRIPTION	HARDNESS	REFERENCE MATERIAL (ANSI)
H3	Case hardened steels	58 < HRC < 62	5115 60 HRC
H5	Quenched & Tempered steels	38 < HRC < 56	4140 50 HRC
H7	Quenched & Tempered steels Bearing steels	56 < HRC < 64	52100 60 HRC
H8	Tool steels High Speed Steels	38 < HRC < 64	H13 50 HRC
H11	Martensitic stainless steels	38 < HRC < 50	420 45 HRC
H12	Precipitation hardened stainless steels	33 < HRC < 50	17-4PH 35 HRC
H21	Manganese steels	23 < HRC < 64	Hadfield, High manganese steel 50 HRC
H31	White cast irons	50 < HRC < 64	A532 ID, White cast iron 55 HRC

**Other difficult materials**

SMG	DESCRIPTION	PROPERTIES UTS = Ultimate tensile strength (ksi)	REFERENCE MATERIAL (ANSI)
PM1	Low alloy PM materials		F-0008 Fe-0.7C
PM2	Medium alloy PM materials		FLC-4608 Fe2Cu1.8Ni0.5Mo0.2Mn0.8C
PM3	High alloy PM materials Exhaust valve seat materials		
HF1	Hard facing alloys Welded or plasma deposited iron based alloys		
HF2	Hard facing alloys Welded or plasma deposited cobalt and nickel based alloys		
CC1	Sintered tungsten carbide		G50

**Plastics and Composites**

SMG	DESCRIPTION	PROPERTIES UTS = Ultimate tensile strength (ksi)	REFERENCE MATERIAL (ANSI)
TS1	Thermosetting polymers		Urea formaldehyde (UF)
TS2	Thermosetting Carbon fibre composites		T300 T700 T800 HTA-S IMA - Epoxy (M21)...
TS3	Thermosetting Glass fibre composites		Epoxy - HX..(42..)/E glass (7781...)...
TS4	Thermosetting Aramide fibre composites		Kevlar 49
TP1	Thermoplastic polymers		Polycarbonate (PC)
TP2	Thermoplastic Carbon fibre composites		PPS/PEEK - T300..
TP3	Thermoplastic Glass fibre composites		PPS/PEEK - E glass or A glass...
TP4	Thermoplastic Aramide fibre composites		

**Graphite**

SMG	DESCRIPTION	PROPERTIES UTS = Ultimate tensile strength (ksi)	REFERENCE MATERIAL (ANSI)
GR1	Graphite		R 8500



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