

TOLERANCES

d_1	+0.000" - .002" (+.000mm -.050mm)
d_2	h6
r	+0.001" - .001" (+.025 -.025mm)
ball radius	+0.000" - .001" (+.000 -.025mm)

HIGH EFFICIENCY MILLING



Series V4S, V4R, V4B

NEW ITEMS

.1562" - .2188"
(3.967mm - 5.558mm)

Variable Helix End Mill - AlCrN-based Coated

Fräser mit Einer Variablen Spiralgeometrie - AlCrN-Basierende Beschichtet

Fresa de Hélice Variable - Recubrimiento Basado en AlCrN

Fraise Avec un Angle Hélice Variable - Revêtement à base de AlCrN

Fresa ad Elica Variabile - Rivestimento in Base AlCrN

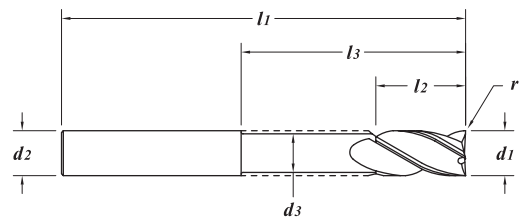
不等螺旋铣刀 - 涂层铝氮化铬



HIGH PERFORMANCE
END MILLS



Solid submicron grain carbide end mill - center cutting
Helix geometry varies of length of flutes
Variable flute design helps with chip evacuation in slots and pockets
Variable rake aids in chip formation
Recommended for titanium, Inconel, and stainless steel (<40 Hrc)
PCT (Polish Carbide Treatment) enhances tool life
Minimizes burr on part
12mm and larger tools offered with weldon flat
Smaller diameters can be modified with a flat within 48 hours
The combination of an extended flute length with a weldon flat may cause the flute washout to reach inside some end mill holders



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Hochleistungs- Vollhartmetallfräser aus Feinkornhartmetall - Zentrumschnitt
Empfohlen für Titan, Inconel, und Rostfreien Stahl (<40 Hrc)
PCT (Polish Carbide Treatment, Treatment zum Polieren Hartmetall) steigert die Stanzzeit bis zu
Reduziert die Gratbildung am Werkstück
Spiralgeometrie variiert auf der gesamten Spanabfuhr beim Schlitz- und Taschenfräsen
Variable Spannutgeometrie für eine bessere Spanabfuhr beim Schlitz- und Taschenfräsen
Variabler Winkel für bessere Spangeometrie
Ab Durchmesser 12 mm und grösser können die Werkzeuge mit Weldon-Spannfläche angeboten werden
Kleinere Durchmesser können innerhalb 48 Stunden mit einer Spannfläche geliefert werden
Die Kombination einer verlängerten Spannutlänge mit einer Weldon-Spannfläche kann die Ursache bei Spannut-Auswaschungen bei einigen Fräsespannfuttern sein



Fresa de submicrono sólido carburo de alto rendimiento - corte centrado
Recomendado para Titanio, Inconel, y Acero inoxidable (<40 Hrc)
PCT (Polish Carbide Treatment, Tratamiento de pulido) aumenta la vida de la hta. hasta
Minimiza las rebabas en la pieza
La geometría de la hélice varía a lo largo de la longitud del labio
El diseño del labio variable contribuye a la evacuación de la viruta en ranuras y cajeros
El labio con filo variable que contribuye a la buena formación de la viruta
Htas de Ø12 mm. y mayores disponibles con mango Weldon
Es posible añadir un plano Weldon en diámetros menores en 48 horas
La combinación de una gran longitud de corte con un mango con plano Weldon puede causar que el labio alcance el interior de algunos portaherramientas



Fraises carbure submicron - coupe au centre
Recommandé pour les titane, inconel, et aciers inoxydables (<40 Hrc)
PCT (le traitement pour polir le carbure) améliore la durée de vie de l'outil
Minimise les bavures sur la pièce
La géométrie de l'hélice varie sur la longueur de l'hélice
Variable des dents de coupe est d'aider à l'évacuation des copeaux de fentes et des poches
Un pas variable améliore la formation des copeaux
Des outils d'un dia. 12 mm ou supérieur sont disponibles avec une queue weldon
Les petits diamètres peuvent être modifiés avec une queue Weldon endéans 48 heures
La combinaison d'une grande longueur de goujure avec une queue Weldon peut causer des vibrations qui peuvent se prolonger dans le mandrin



Fresa sub-micrograno metallo duro - taglio al centro
Raccomandata per lavorazioni su titanio, inconel, e inox (<40 Hrc)
PCT (Polish Carbide Treatment, trattamento di lucidatura del metallo duro) incrementa la vita utensile
Non crea bava sul pezzo
La geometria dell'elica varia sulla lunghezza del tagliente
La geometria variabile del tagliente aiuta l'evacuazione del truciolo negli svuotamenti e nelle cave
L'angolo di spoglia variabile aiuta la formazione del truciolo
Dal diametro 12 mm in su disponibili con attacco weldon
Diametri più piccoli possono essere modificati in 48 ore
Estendere la lunghezza del tagliente su un attacco Weldon può causare la rottura dell'utensile in alcune applicazioni



超细晶粒整体硬质合金立铣刀 - 中心切削
推荐的加工材料：钛合金、不锈钢、(≤40HRC)
PCT(硬质合金抛光处理)使刀具寿命提高
使工件的毛刺最少
整个切削刃的螺旋角可变
切削刃螺旋角可变的设计有利于碎屑在加工槽和型腔中排出
可变的前角有利于碎屑的形成
12mm及以上刀具提供侧刃槽位设计
可在48小时内生产小直径的平底刀具
过长的刀具结合侧刃槽位的刀具可能会导致刀具夹头受到冲击而损坏

EDP#			d_1 †			d_2	l_1	l_2	r	l_3	d_3
(plain)	(weldon)		Decimal	Diameter	Metric	Shank Diameter	Overall Length	Flute Length	Corner Radius	Reach Length	Neck Diameter
NEW	50171	-	.1562	5/32"	3.967	1/4"	2"	1/2"	-	-	-
NEW	50172	-	.1562	5/32"	3.967	1/4"	2"	1/2"	.010"	-	-
NEW	50173	-	.1562	5/32"	3.967	1/4"	2"	1/2"	.015"	-	-
NEW	50174	-	.1562	5/32"	3.967	1/4"	2"	1/2"	.020"	-	-
NEW	50175	-	.1562	5/32"	3.967	1/4"	2"	1/2"	.030"	-	-
NEW	50176	-	.1562	5/32"	3.967	1/4"	2"	1/2"	BALL	-	-
NEW	50177	-	.1575		4.000	6.0	50	12	-	-	-
NEW	50178	-	.1575		4.000	6.0	50	12	0.20	-	-
NEW	50179	-	.1575		4.000	6.0	50	12	0.30	-	-
NEW	50180	-	.1575		4.000	6.0	50	12	0.50	-	-
NEW	50181	-	.1575		4.000	6.0	50	12	BALL	-	-
NEW	50182	-	.1875	3/16"	4.763	1/4"	2"	1/2"	-	-	-
NEW	50183	-	.1875	3/16"	4.763	1/4"	2"	1/2"	.010"	-	-
NEW	50184	-	.1875	3/16"	4.763	1/4"	2"	1/2"	.015"	-	-
NEW	50185	-	.1875	3/16"	4.763	1/4"	2"	1/2"	.020"	-	-
NEW	50186	-	.1875	3/16"	4.763	1/4"	2"	1/2"	.030"	-	-
NEW	50187	-	.1875	3/16"	4.763	1/4"	2"	1/2"	BALL	-	-
NEW	50188	-	.1969		5.000	6.0	65	20	-	-	-
NEW	50189	-	.1969		5.000	6.0	65	20	0.20	-	-
NEW	50190	-	.1969		5.000	6.0	65	20	0.30	-	-
NEW	50191	-	.1969		5.000	6.0	65	20	0.50	-	-
NEW	50192	-	.1969		5.000	6.0	65	20	BALL	-	-
NEW	50193	-	.2188	7/32"	5.558	1/4"	2-1/2"	3/4"	-	-	-
NEW	50194	-	.2188	7/32"	5.558	1/4"	2-1/2"	3/4"	.010"	-	-
NEW	50195	-	.2188	7/32"	5.558	1/4"	2-1/2"	3/4"	.015"	-	-
NEW	50196	-	.2188	7/32"	5.558	1/4"	2-1/2"	3/4"	.020"	-	-
NEW	50197	-	.2188	7/32"	5.558	1/4"	2-1/2"	3/4"	.030"	-	-
NEW	50198	-	.2188	7/32"	5.558	1/4"	2-1/2"	3/4"	BALL	-	-

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MATERIAL HARDNESS (Rc)

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continued →

Series V4S, V4R, V4B (continued)

.2362" - .2500"
(6.000mm - 6.350mm)

EDP#		$d1$ † Diameter		$d2$ Shank Diameter	$l1$ Overall Length	$l2$ Flute Length	r Corner Radius	$l3$ Reach Length	$d3$ Neck Diameter
		Decimal	Metric						
50236	-	.2362	6.000	6.0	65	12	-	-	-
50199	-	.2362	6.000	6.0	65	12	0.30	-	-
50200	-	.2362	6.000	6.0	65	12	0.50	-	-
50201	-	.2362	6.000	6.0	65	12	0.75	-	-
50202	-	.2362	6.000	6.0	65	12	1.00	-	-
50203	-	.2362	6.000	6.0	65	12	1.50	-	-
50252	-	.2362	6.000	6.0	65	12	BALL	-	-
50237	-	.2362	6.000	6.0	65	19	-	-	-
50204	-	.2362	6.000	6.0	65	19	0.30	-	-
50205	-	.2362	6.000	6.0	65	19	0.50	-	-
50206	-	.2362	6.000	6.0	65	19	1.00	-	-
50253	-	.2362	6.000	6.0	65	19	BALL	-	-
50540	-	.2500	1/4"	6.350	1/4"	2"	3/8"	-	-
50489	-	.2500	1/4"	6.350	1/4"	2"	3/8"	.010"	-
50490	-	.2500	1/4"	6.350	1/4"	2"	3/8"	.015"	-
50491	-	.2500	1/4"	6.350	1/4"	2"	3/8"	.020"	-
NEW	50708	-	.2500	1/4"	6.350	1/4"	2"	3/8"	.030"
NEW	50709	-	.2500	1/4"	6.350	1/4"	2"	3/8"	.040"
NEW	50710	-	.2500	1/4"	6.350	1/4"	2"	3/8"	.060"
NEW	50711	-	.2500	1/4"	6.350	1/4"	2"	3/8"	.090"
	50560	-	.2500	1/4"	6.350	1/4"	2"	3/8"	BALL
	50645	-	.2500	1/4"	6.350	1/4"	2"	1/2"	-
	50614	-	.2500	1/4"	6.350	1/4"	2"	1/2"	.010"
	50616	-	.2500	1/4"	6.350	1/4"	2"	1/2"	.015"
	50618	-	.2500	1/4"	6.350	1/4"	2"	1/2"	.020"
NEW	50712	-	.2500	1/4"	6.350	1/4"	2"	1/2"	.030"
NEW	50713	-	.2500	1/4"	6.350	1/4"	2"	1/2"	.040"
NEW	50714	-	.2500	1/4"	6.350	1/4"	2"	1/2"	.060"
NEW	50715	-	.2500	1/4"	6.350	1/4"	2"	1/2"	.090"
	50238	-	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	-
	50207	-	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.010"
	50208	-	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.015"
	50620	-	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.020"
	50209	-	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.030"
NEW	50716	-	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.040"
	50210	-	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.060"
NEW	50717	-	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	.090"
	50254	-	.2500	1/4"	6.350	1/4"	2-1/2"	3/4"	BALL
NEW	50653	-	.2500	1/4"	6.350	1/4"	3"	1-1/8"	-
	50493	-	.2500	1/4"	6.350	1/4"	3"	1-1/8"	.030"
NEW	50677	-	.2500	1/4"	6.350	1/4"	3"	1-1/8"	BALL

Series V4S, V4R, V4B (continued)

.2500" - .3150"
(6.350mm - 8.000mm)

HIGH PERFORMANCE
END MILLS

	EDP#		d_1 †			d_2	l_1	l_2	r	l_3	d_3
	(plain)	(weldon)	Decimal	Diameter	Metric	Shank Diameter	Overall Length	Flute Length	Corner Radius	Reach Length	Neck Diameter
NEW	50654	-	.2500	1/4"	6.350	1/4"	4"	1-1/2"	-	-	-
NEW	50681	-	.2500	1/4"	6.350	1/4"	4"	1-1/2"	BALL	-	-
NEW	50655	-	.2500	1/4"	6.350	1/4"	4"	1-3/4"	-	-	-
NEW	50718	-	.2500	1/4"	6.350	1/4"	4"	1-3/4"	.020"	-	-
NEW	50682	-	.2500	1/4"	6.350	1/4"	4"	1-3/4"	BALL	-	-
NEW	50656	-	.2500	1/4"	6.350	1/4"	4"	2"	-	-	-
NEW	50683	-	.2500	1/4"	6.350	1/4"	4"	2"	BALL	-	-
NEW	50651	-	.2500	1/4"	6.350	1/4"	3"	3/8"	-	1-1/8"	.237"
NEW	50678	-	.2500	1/4"	6.350	1/4"	3"	3/8"	BALL	1-1/8"	.237"
	50600	-	.2500	1/4"	6.350	1/4"	4"	3/8"	-	1-1/8"	.237"
	50211	-	.2500	1/4"	6.350	1/4"	4"	3/8"	.015"	1-1/4"	.230"
	50474	-	.2500	1/4"	6.350	1/4"	4"	3/8"	BALL	1-1/8"	.237"
NEW	50679	-	.2500	1/4"	6.350	1/4"	4"	3/8"	BALL	1-1/2"	.237"
NEW	50652	-	.2500	1/4"	6.350	1/4"	4"	3/8"	-	2"	.237"
NEW	50680	-	.2500	1/4"	6.350	1/4"	4"	3/8"	BALL	2"	.237"
NEW	50719	-	.2500	1/4"	6.350	1/4"	6"	3/8"	.010"	4"	.230"
NEW	50680	-	.2500	1/4"	6.350	1/4"	6"	3/8"	BALL	4"	.230"
NEW	50720	-	.3125	5/16"	7.937	5/16"	2"	3/8"	.030"	-	-
	50541	-	.3125	5/16"	7.937	5/16"	2"	7/16"	-	-	-
	50622	-	.3125	5/16"	7.937	5/16"	2"	7/16"	.010"	-	-
	50624	-	.3125	5/16"	7.937	5/16"	2"	7/16"	.015"	-	-
	50492	-	.3125	5/16"	7.937	5/16"	2"	7/16"	.020"	-	-
NEW	50721	-	.3125	5/16"	7.937	5/16"	2"	7/16"	.125"	-	-
	50561	-	.3125	5/16"	7.937	5/16"	2"	7/16"	BALL	-	-
	50239	-	.3125	5/16"	7.937	5/16"	2-1/2"	13/16"	-	-	-
	50626	-	.3125	5/16"	7.937	5/16"	2-1/2"	13/16"	.010"	-	-
	50628	-	.3125	5/16"	7.937	5/16"	2-1/2"	13/16"	.015"	-	-
	50212	-	.3125	5/16"	7.937	5/16"	2-1/2"	13/16"	.020"	-	-
	50213	-	.3125	5/16"	7.937	5/16"	2-1/2"	13/16"	.030"	-	-
NEW	50722	-	.3125	5/16"	7.937	5/16"	2-1/2"	13/16"	.060"	-	-
NEW	50723	-	.3125	5/16"	7.937	5/16"	2-1/2"	13/16"	.125"	-	-
	50255	-	.3125	5/16"	7.937	5/16"	2-1/2"	13/16"	BALL	-	-
NEW	50657	-	.3125	5/16"	7.937	5/16"	3"	1-1/4"	-	-	-
NEW	50724	-	.3125	5/16"	7.937	5/16"	3"	1-1/4"	.015"	-	-
NEW	50725	-	.3125	5/16"	7.937	5/16"	3"	1-1/4"	.030"	-	-
NEW	50726	-	.3125	5/16"	7.937	5/16"	3"	1-1/4"	.060"	-	-
NEW	50685	-	.3125	5/16"	7.937	5/16"	3"	1-1/4"	BALL	-	-
NEW	50658	-	.3125	5/16"	7.937	5/16"	3"	7/16"	-	1-1/2"	.295"
NEW	50686	-	.3125	5/16"	7.937	5/16"	3"	7/16"	BALL	1-1/2"	.295"
	50602	-	.3150		8.000	8.0	50	12	-	-	-
	50630	-	.3150		8.000	8.0	50	12	0.50	-	-
	50240	-	.3150		8.000	8.0	65	22	-	-	-
	50214	-	.3150		8.000	8.0	65	22	0.50	-	-
	50356	-	.3150		8.000	8.0	65	22	0.75	-	-
	50215	-	.3150		8.000	8.0	65	22	1.00	-	-
NEW	50727	-	.3150		8.000	8.0	65	22	1.20	-	-
	50357	-	.3150		8.000	8.0	65	22	1.50	-	-
	50358	-	.3150		8.000	8.0	65	22	2.00	-	-
NEW	50728	-	.3150		8.000	8.0	65	22	3.00	-	-
	50256	-	.3150		8.000	8.0	65	22	BALL	-	-

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MATERIAL HARDNESS (Rc)

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continued →

Series V4S, V4R, V4B (continued)

.3150" - .3937"
(8.000mm - 10.000mm)

	EDP#		d_1 †		d_2	l_1	l_2	r	l_3	d_3
	(plain)	(weldon)	Decimal	Diameter	Shank Diameter	Overall Length	Flute Length	Corner Radius	Reach Length	Neck Diameter
NEW	50659	-	.3150	8.000	8.0	75	32	-	-	-
NEW	50687	-	.3150	8.000	8.0	75	32	BALL	-	-
NEW	50660	-	.3150	8.000	8.0	100	12	-	50	7.50
NEW	50688	-	.3150	8.000	8.0	100	12	BALL	50	7.50
	50542	-	.3750	3/8"	9.525	3/8"	2"	1/2"	-	-
	50632	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.010"	-
NEW	50729	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.015"	-
	50494	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.020"	-
	50634	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.030"	-
NEW	50730	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.060"	-
NEW	50732	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.090"	-
NEW	50733	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.120"	-
NEW	50734	-	.3750	3/8"	9.525	3/8"	2"	1/2"	.125"	-
	50562	-	.3750	3/8"	9.525	3/8"	2"	1/2"	BALL	-
	50241	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	-	-
	50216	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.010"	-
NEW	50735	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.015"	-
	50217	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.020"	-
	50218	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.030"	-
NEW	50736	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.040"	-
	50219	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.060"	-
	50636	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.090"	-
NEW	50737	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.120"	-
NEW	50738	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	.125"	-
	50257	-	.3750	3/8"	9.525	3/8"	2-1/2"	1"	BALL	-
NEW	50661	-	.3750	3/8"	9.525	3/8"	3"	1-1/4"	-	-
NEW	50739	-	.3750	3/8"	9.525	3/8"	3"	1-1/4"	.015"	-
	50637	-	.3750	3/8"	9.525	3/8"	3"	1-1/4"	.030"	-
NEW	50740	-	.3750	3/8"	9.525	3/8"	3"	1-1/4"	.060"	-
NEW	50689	-	.3750	3/8"	9.525	3/8"	3"	1-1/4"	BALL	-
NEW	50662	-	.3750	3/8"	9.525	3/8"	4"	1-1/2"	-	-
NEW	50741	-	.3750	3/8"	9.525	3/8"	4"	1-1/2"	.015"	-
NEW	50742	-	.3750	3/8"	9.525	3/8"	4"	1-1/2"	.030"	-
NEW	50743	-	.3750	3/8"	9.525	3/8"	4"	1-1/2"	.060"	-
NEW	50744	-	.3750	3/8"	9.525	3/8"	4"	1-1/2"	.120"	-
NEW	50690	-	.3750	3/8"	9.525	3/8"	4"	1-1/2"	BALL	-
NEW	50745	-	.3750	3/8"	9.525	3/8"	6"	2-1/2"	.060	-
	50604	-	.3750	3/8"	9.525	3/8"	4"	1/2"	-	1-1/8"
	50220	-	.3750	3/8"	9.525	3/8"	4"	1/2"	.020"	1-7/8"
	50476	-	.3750	3/8"	9.525	3/8"	4"	1/2"	BALL	1-1/8"
	50606	-	.3937	10.000	10.0	50	14	-	-	.355"
	50638	-	.3937	10.000	10.0	50	14	0.50	-	-
	50242	-	.3937	10.000	10.0	70	22	-	-	-
NEW	50746	-	.3937	10.000	10.0	70	22	0.25	-	-
	50221	-	.3937	10.000	10.0	70	22	0.50	-	-
	50359	-	.3937	10.000	10.0	70	22	0.75	-	-
	50360	-	.3937	10.000	10.0	70	22	1.00	-	-
	50361	-	.3937	10.000	10.0	70	22	1.50	-	-
	50362	-	.3937	10.000	10.0	70	22	2.00	-	-
NEW	50747	-	.3937	10.000	10.0	70	22	3.00	-	-
	50258	-	.3937	10.000	10.0	70	22	BALL	-	-
	50608	-	.3937	10.000	10.0	70	26	-	-	-
NEW	50748	-	.3937	10.000	10.0	70	26	1.50	-	-
NEW	50663	-	.3937	10.000	10.0	70	30	-	-	-
NEW	50691	-	.3937	10.000	10.0	70	30	BALL	-	-

Series V4S, V4R, V4B (continued)

.3937" - .5000"
(10.000mm - 12.700mm)

HIGH PERFORMANCE
END MILLS

	EDP#		d_1 † Diameter		d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	r Corner Radius	l_3 Reach Length	d_3 Neck Diameter
	(plain)	(weldon)	Decimal	Metric						
NEW	50749	-	.3937	10.000	10.0	70	22	0.50	30	9.40
NEW	50750	-	.3937	10.000	10.0	100	12	0.30	50	9.40
NEW	50692	-	.3937	10.000	10.0	100	14	BALL	50	9.40
	50450	50449	.4724	12.000	12.0	75	26	-	-	-
	50363	50369	.4724	12.000	12.0	75	26	0.30	-	-
	50364	50370	.4724	12.000	12.0	75	26	0.50	-	-
	50365	50366	.4724	12.000	12.0	75	26	0.75	-	-
	50367	50371	.4724	12.000	12.0	75	26	1.00	-	-
	50372	50373	.4724	12.000	12.0	75	26	1.50	-	-
	50374	50375	.4724	12.000	12.0	75	26	2.00	-	-
	50470	-	.4724	12.000	12.0	75	26	BALL	-	-
	50243	50283	.4724	12.000	12.0	75	32	-	-	-
	50222	50270	.4724	12.000	12.0	75	32	0.50	-	-
	50223	50271	.4724	12.000	12.0	75	32	1.00	-	-
	50259	50291	.4724	12.000	12.0	75	32	BALL	-	-
NEW	50664	-	.4724	12.000	12.0	88	36	-	-	-
NEW	50751	-	.4724	12.000	12.0	88	36	0.30	-	-
NEW	50752	-	.4724	12.000	12.0	88	36	0.50	-	-
NEW	50753	-	.4724	12.000	12.0	88	36	1.00	-	-
NEW	50754	-	.4724	12.000	12.0	88	36	1.50	-	-
NEW	50755	-	.4724	12.000	12.0	88	36	3.00	-	-
NEW	50693	-	.4724	12.000	12.0	88	36	BALL	-	-
	50564	-	.4724	12.000	12.0	100	42	-	-	-
	50566	-	.4724	12.000	12.0	100	42	0.30	-	-
	50568	-	.4724	12.000	12.0	100	42	0.50	-	-
	50570	-	.4724	12.000	12.0	100	42	1.00	-	-
	50572	-	.4724	12.000	12.0	100	42	2.00	-	-
	50574	-	.4724	12.000	12.0	100	42	3.00	-	-
	50576	-	.4724	12.000	12.0	100	42	BALL	-	-
NEW	50665	-	.4724	12.000	12.0	100	48	-	-	-
NEW	50756	-	.4724	12.000	12.0	100	48	0.30	-	-
NEW	50757	-	.4724	12.000	12.0	100	48	0.50	-	-
NEW	50758	-	.4724	12.000	12.0	100	48	1.00	-	-
NEW	50759	-	.4724	12.000	12.0	100	48	1.50	-	-
NEW	50760	-	.4724	12.000	12.0	100	48	3.00	-	-
NEW	50761	-	.4724	12.000	12.0	100	48	4.00	-	-
NEW	50694	-	.4724	12.000	12.0	100	48	BALL	-	-
NEW	50695	-	.4724	12.000	12.0	100	14	BALL	50	11.40
	50543	-	.5000 1/2"	12.700	1/2"	2-1/2"	5/8"	-	-	-
	50640	-	.5000 1/2"	12.700	1/2"	2-1/2"	5/8"	.010"	-	-
NEW	50762	-	.5000 1/2"	12.700	1/2"	2-1/2"	5/8"	.015"	-	-
	50496	50497	.5000 1/2"	12.700	1/2"	2-1/2"	5/8"	.020"	-	-
	50642	-	.5000 1/2"	12.700	1/2"	2-1/2"	5/8"	.030"	-	-
NEW	50763	-	.5000 1/2"	12.700	1/2"	2-1/2"	5/8"	.060"	-	-
NEW	50764	-	.5000 1/2"	12.700	1/2"	2-1/2"	5/8"	.090"	-	-
NEW	50765	-	.5000 1/2"	12.700	1/2"	2-1/2"	5/8"	.120"	-	-
	50644	-	.5000 1/2"	12.700	1/2"	2-1/2"	5/8"	.125"	-	-
NEW	50766	-	.5000 1/2"	12.700	1/2"	2-1/2"	5/8"	.156"	-	-
NEW	50767	-	.5000 1/2"	12.700	1/2"	2-1/2"	5/8"	.190"	-	-
	50563	-	.5000 1/2"	12.700	1/2"	2-1/2"	5/8"	BALL	-	-

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MATERIAL HARDNESS (Rc)

0

continued →

Series V4S, V4R, V4B (continued)

.5000"
(12.700mm)

EDP#		$d1$ †			$d2$	$l1$	$l2$	r	$l3$	$d3$
(plain)	(weldon)	Decimal	Diameter	Metric	Shank Diameter	Overall Length	Flute Length	Corner Radius	Reach Length	Neck Diameter
50452	50453	.5000	1/2"	12.700	1/2"	3"	1"	-	-	-
50379	50380	.5000	1/2"	12.700	1/2"	3"	1"	.010"	-	-
NEW	50768	-	.5000	1/2"	1/2"	3"	1"	.015"	-	-
50381	50382	.5000	1/2"	12.700	1/2"	3"	1"	.020"	-	-
50383	50384	.5000	1/2"	12.700	1/2"	3"	1"	.030"	-	-
50385	50386	.5000	1/2"	12.700	1/2"	3"	1"	.060"	-	-
NEW	50769	-	.5000	1/2"	1/2"	3"	1"	.090"	-	-
NEW	50770	-	.5000	1/2"	1/2"	3"	1"	.120"	-	-
NEW	50771	-	.5000	1/2"	1/2"	3"	1"	.125"	-	-
NEW	50772	-	.5000	1/2"	1/2"	3"	1"	.190"	-	-
50472	50473	.5000	1/2"	12.700	1/2"	3"	1"	BALL	-	-
50244	50284	.5000	1/2"	12.700	1/2"	3"	1-1/4"	-	-	-
50224	50272	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.010"	-	-
NEW	50773	-	.5000	1/2"	1/2"	3"	1-1/4"	.015"	-	-
50225	50273	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.020"	-	-
50226	50274	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.030"	-	-
50227	50275	.5000	1/2"	12.700	1/2"	3"	1-1/4"	.060"	-	-
NEW	50774	-	.5000	1/2"	1/2"	3"	1-1/4"	.090"	-	-
NEW	50775	-	.5000	1/2"	1/2"	3"	1-1/4"	.120"	-	-
NEW	50776	-	.5000	1/2"	1/2"	3"	1-1/4"	.125"	-	-
NEW	50777	-	.5000	1/2"	1/2"	3"	1-1/4"	.156"	-	-
NEW	50778	-	.5000	1/2"	1/2"	3"	1-1/4"	.190"	-	-
50260	50292	.5000	1/2"	12.700	1/2"	3"	1-1/4"	BALL	-	-
NEW	50666	-	.5000	1/2"	1/2"	3-1/2"	1-1/2"	-	-	-
NEW	50779	-	.5000	1/2"	1/2"	3-1/2"	1-1/2"	.010"	-	-
NEW	50780	-	.5000	1/2"	1/2"	3-1/2"	1-1/2"	.015"	-	-
NEW	50781	-	.5000	1/2"	1/2"	3-1/2"	1-1/2"	.020"	-	-
NEW	50782	-	.5000	1/2"	1/2"	3-1/2"	1-1/2"	.030"	-	-
NEW	50783	-	.5000	1/2"	1/2"	3-1/2"	1-1/2"	.060"	-	-
NEW	50784	-	.5000	1/2"	1/2"	3-1/2"	1-1/2"	.090"	-	-
NEW	50785	-	.5000	1/2"	1/2"	3-1/2"	1-1/2"	.120"	-	-
NEW	50696	-	.5000	1/2"	1/2"	3-1/2"	1-1/2"	BALL	-	-
50578	50579	.5000	1/2"	12.700	1/2"	4"	1-5/8"	-	-	-
50580	50581	.5000	1/2"	12.700	1/2"	4"	1-5/8"	.010"	-	-
50582	50583	.5000	1/2"	12.700	1/2"	4"	1-5/8"	.020"	-	-
50584	50585	.5000	1/2"	12.700	1/2"	4"	1-5/8"	.030"	-	-
50586	50587	.5000	1/2"	12.700	1/2"	4"	1-5/8"	.040"	-	-
50588	50589	.5000	1/2"	12.700	1/2"	4"	1-5/8"	.060"	-	-
50590	50591	.5000	1/2"	12.700	1/2"	4"	1-5/8"	.120"	-	-
50592	50593	.5000	1/2"	12.700	1/2"	4"	1-5/8"	BALL	-	-
50646	-	.5000	1/2"	12.700	1/2"	4"	1-3/4"	-	-	-
50647	-	.5000	1/2"	12.700	1/2"	4"	2"	-	-	-
50245	50285	.5000	1/2"	12.700	1/2"	4"	2-1/8"	-	-	-
NEW	50786	-	.5000	1/2"	1/2"	4"	2-1/8"	.010"	-	-
NEW	50787	-	.5000	1/2"	1/2"	4"	2-1/8"	.015"	-	-
NEW	50788	-	.5000	1/2"	1/2"	4"	2-1/8"	.020"	-	-
NEW	50789	-	.5000	1/2"	1/2"	4"	2-1/8"	.030"	-	-
NEW	50790	-	.5000	1/2"	1/2"	4"	2-1/8"	.060"	-	-
NEW	50791	-	.5000	1/2"	1/2"	4"	2-1/8"	.090"	-	-
NEW	50792	-	.5000	1/2"	1/2"	4"	2-1/8"	.120"	-	-
NEW	50793	-	.5000	1/2"	1/2"	4"	2-1/8"	.125"	-	-
NEW	50794	-	.5000	1/2"	1/2"	4"	2-1/8"	.190"	-	-
50261	50293	.5000	1/2"	12.700	1/2"	4"	2-1/8"	BALL	-	-

Series V4S, V4R, V4B (continued)

.5000" - .6250"
(12.700mm - 15.875mm)

HIGH PERFORMANCE
END MILLS

	EDP#		d_1 †			d_2	l_1	l_2	r	l_3	d_3
	(plain)	(weldon)	Decimal	Diameter	Metric	Shank Diameter	Overall Length	Flute Length	Corner Radius	Reach Length	Neck Diameter
NEW	50668	-	.5000	1/2"	12.700	1/2"	6"	3"	-	-	-
NEW	50795	-	.5000	1/2"	12.700	1/2"	6"	3"	.020"	-	-
NEW	50796	-	.5000	1/2"	12.700	1/2"	6"	3"	.030"	-	-
NEW	50797	-	.5000	1/2"	12.700	1/2"	6"	3"	.060"	-	-
NEW	50798	-	.5000	1/2"	12.700	1/2"	6"	3"	.120"	-	-
NEW	50799	-	.5000	1/2"	12.700	1/2"	6"	3"	.190"	-	-
NEW	50699	-	.5000	1/2"	12.700	1/2"	6"	3"	BALL	-	-
	50610	-	.5000	1/2"	12.700	1/2"	4"	5/8"	-	2-1/4"	.475"
	50228	-	.5000	1/2"	12.700	1/2"	4"	5/8"	.020"	2-1/4"	.470"
NEW	50900	-	.5000	1/2"	12.700	1/2"	4"	5/8"	.030"	2-1/4"	.470"
NEW	50901	-	.5000	1/2"	12.700	1/2"	4"	5/8"	.060"	2-1/4"	.470"
NEW	50902	-	.5000	1/2"	12.700	1/2"	4"	5/8"	.120"	2-1/4"	.470"
	50478	-	.5000	1/2"	12.700	1/2"	4"	5/8"	BALL	2-1/4"	.475"
NEW	50667	-	.5000	1/2"	12.700	1/2"	6"	5/8"	-	3-1/8"	.475"
	50235	-	.5000	1/2"	12.700	1/2"	6"	5/8"	-	4-1/8"	.475"
	50594	-	.5000	1/2"	12.700	1/2"	6"	5/8"	.020"	4-1/8"	.470"
	50596	-	.5000	1/2"	12.700	1/2"	6"	5/8"	.030"	4-1/8"	.470"
NEW	50697	-	.5000	1/2"	12.700	1/2"	6"	5/8"	BALL	3-1/8"	.475"
	50598	-	.5000	1/2"	12.700	1/2"	6"	5/8"	BALL	4-1/8"	.475"
NEW	50698	-	.5000	1/2"	12.700	1/2"	6"	1"	BALL	4-1/2"	.475"
	50545	50546	.6250	5/8"	15.875	5/8"	3"	3/4"	-	-	-
NEW	50903	-	.6250	5/8"	15.875	5/8"	3"	3/4"	.010"	-	-
NEW	50904	-	.6250	5/8"	15.875	5/8"	3"	3/4"	.015"	-	-
	50498	50499	.6250	5/8"	15.875	5/8"	3"	3/4"	.020"	-	-
	50500	50501	.6250	5/8"	15.875	5/8"	3"	3/4"	.030"	-	-
	50502	50503	.6250	5/8"	15.875	5/8"	3"	3/4"	.060"	-	-
NEW	50905	-	.6250	5/8"	15.875	5/8"	3"	3/4"	.090"	-	-
NEW	50906	-	.6250	5/8"	15.875	5/8"	3"	3/4"	.120"	-	-
NEW	50907	-	.6250	5/8"	15.875	5/8"	3"	3/4"	.125"	-	-
NEW	50908	-	.6250	5/8"	15.875	5/8"	3"	3/4"	.156"	-	-
NEW	50909	-	.6250	5/8"	15.875	5/8"	3"	3/4"	.190"	-	-
NEW	50910	-	.6250	5/8"	15.875	5/8"	3"	3/4"	.250"	-	-
	50246	50286	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	-	-	-
NEW	50911	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.010"	-	-
NEW	50912	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.015"	-	-
	50229	50277	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.020"	-	-
	50534	50535	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.030"	-	-
	50536	50537	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.040"	-	-
	50538	50539	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.060"	-	-
NEW	50913	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.090"	-	-
	50230	50278	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.120"	-	-
NEW	50914	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.125"	-	-
NEW	50915	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.156"	-	-
NEW	50916	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.190"	-	-
NEW	50917	-	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	.250"	-	-
	50262	50294	.6250	5/8"	15.875	5/8"	3-1/2"	1-1/4"	BALL	-	-

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MATERIAL HARDNESS (Rc)

0

continued →

Series V4S, V4R, V4B (continued)

.6250" - .6299"
(15.875mm - 16.000mm)

	EDP#		d_1 † Diameter			d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	r Corner Radius	l_3 Reach Length	d_3 Neck Diameter
	(plain)	(weldon)	Decimal		Metric						
NEW	50669	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	-	-	-
NEW	50918	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.010"	-	-
NEW	50919	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.015"	-	-
NEW	50920	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.020"	-	-
NEW	50921	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.030"	-	-
NEW	50922	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.060"	-	-
NEW	50923	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.090"	-	-
NEW	50924	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.120"	-	-
NEW	50925	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.125"	-	-
NEW	50926	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.156"	-	-
NEW	50927	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.190"	-	-
NEW	50928	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	.250"	-	-
NEW	50700	-	.6250	5/8"	15.875	5/8"	4"	1-1/2"	BALL	-	-
	50612	-	.6250	5/8"	15.875	5/8"	4"	1-5/8"	-	-	-
NEW	50670	-	.6250	5/8"	15.875	5/8"	4"	1-3/4"	-	-	-
NEW	50701	-	.6250	5/8"	15.875	5/8"	4"	1-3/4"	BALL	-	-
	50547	-	.6299		16.000	16.0	75	19	-	-	-
	50504	-	.6299		16.000	16.0	75	19	0.50	-	-
	50506	-	.6299		16.000	16.0	75	19	1.00	-	-
	50508	-	.6299		16.000	16.0	75	19	3.00	-	-
NEW	50929	-	.6299		16.000	16.0	75	19	4.00	-	-
NEW	50930	-	.6299		16.000	16.0	75	19	5.00	-	-
NEW	50931	-	.6299		16.000	16.0	75	19	6.00	-	-
	50247	50287	.6299		16.000	16.0	88	32	-	-	-
	50231	50279	.6299		16.000	16.0	88	32	0.50	-	-
	50409	50410	.6299		16.000	16.0	88	32	0.75	-	-
	50411	50412	.6299		16.000	16.0	88	32	1.00	-	-
	50413	50414	.6299		16.000	16.0	88	32	1.50	-	-
	50415	50416	.6299		16.000	16.0	88	32	2.00	-	-
NEW	50932	-	.6299		16.000	16.0	88	32	2.50	-	-
	50417	50418	.6299		16.000	16.0	88	32	3.00	-	-
NEW	50933	-	.6299		16.000	16.0	88	32	4.00	-	-
NEW	50934	-	.6299		16.000	16.0	88	32	5.00	-	-
NEW	50935	-	.6299		16.000	16.0	88	32	6.00	-	-
	50263	50295	.6299		16.000	16.0	88	32	BALL	-	-
NEW	50671	-	.6299		16.000	16.0	100	48	-	-	-
NEW	50936	-	.6299		16.000	16.0	100	48	0.50	-	-
NEW	50937	-	.6299		16.000	16.0	100	48	1.00	-	-
NEW	50938	-	.6299		16.000	16.0	100	48	1.50	-	-
NEW	50939	-	.6299		16.000	16.0	100	48	2.00	-	-
NEW	50940	-	.6299		16.000	16.0	100	48	3.00	-	-
NEW	50941	-	.6299		16.000	16.0	100	48	4.00	-	-
NEW	50942	-	.6299		16.000	16.0	100	48	5.00	-	-
NEW	50943	-	.6299		16.000	16.0	100	48	6.00	-	-
NEW	50702	-	.6299		16.000	16.0	100	48	BALL	-	-

Series V4S, V4R, V4B (continued)

.7500"
(19.050mm)

HIGH PERFORMANCE
END MILLS

	EDP#		d_1 †			d_2	l_1	l_2	r	l_3	d_3
	(plain)	(weldon)	Decimal	Diameter	Metric	Shank Diameter	Overall Length	Flute Length	Corner Radius	Reach Length	Neck Diameter
	50548	-	.7500	3/4"	19.050	3/4"	3"	7/8"	-	-	-
NEW	50944	-	.7500	3/4"	19.050	3/4"	3"	7/8"	.010"	-	-
NEW	50945	-	.7500	3/4"	19.050	3/4"	3"	7/8"	.015"	-	-
NEW	50946	-	.7500	3/4"	19.050	3/4"	3"	7/8"	.020"	-	-
	50556	-	.7500	3/4"	19.050	3/4"	3"	7/8"	.030"	-	-
NEW	50947	-	.7500	3/4"	19.050	3/4"	3"	7/8"	.060"	-	-
NEW	50948	-	.7500	3/4"	19.050	3/4"	3"	7/8"	.120"	-	-
	50549	50550	.7500	3/4"	19.050	3/4"	4"	1"	-	-	-
NEW	50949	-	.7500	3/4"	19.050	3/4"	4"	1"	.010"	-	-
NEW	50950	-	.7500	3/4"	19.050	3/4"	4"	1"	.015"	-	-
	50510	50511	.7500	3/4"	19.050	3/4"	4"	1"	.020"	-	-
	50512	50513	.7500	3/4"	19.050	3/4"	4"	1"	.030"	-	-
	50514	50515	.7500	3/4"	19.050	3/4"	4"	1"	.060"	-	-
NEW	50951	-	.7500	3/4"	19.050	3/4"	4"	1"	.090"	-	-
NEW	50952	-	.7500	3/4"	19.050	3/4"	4"	1"	.120"	-	-
NEW	50953	-	.7500	3/4"	19.050	3/4"	4"	1"	.190"	-	-
NEW	50954	-	.7500	3/4"	19.050	3/4"	4"	1"	.250"	-	-
NEW	50955	-	.7500	3/4"	19.050	3/4"	4"	1"	.3125"	-	-
	50248	50288	.7500	3/4"	19.050	3/4"	4"	1-1/2"	-	-	-
NEW	50956	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.010"	-	-
NEW	50957	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.015"	-	-
	50516	50517	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.020"	-	-
	50232	50280	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.030"	-	-
	50518	50519	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.060"	-	-
NEW	50958	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.090"	-	-
	50520	50521	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.120"	-	-
NEW	50959	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.125"	-	-
NEW	50960	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.156"	-	-
NEW	50961	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.190"	-	-
NEW	50962	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.250"	-	-
NEW	50963	-	.7500	3/4"	19.050	3/4"	4"	1-1/2"	.3125"	-	-
	50264	50296	.7500	3/4"	19.050	3/4"	4"	1-1/2"	BALL	-	-
	50551	50552	.7500	3/4"	19.050	3/4"	4"	1-3/4"	-	-	-
NEW	50964	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.010"	-	-
NEW	50965	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.015"	-	-
	50522	50523	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.020"	-	-
	50524	50525	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.030"	-	-
	50526	50527	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.060"	-	-
NEW	50966	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.090"	-	-
NEW	50967	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.120"	-	-
NEW	50968	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.125"	-	-
NEW	50969	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.156"	-	-
NEW	50970	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.190"	-	-
NEW	50971	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.250"	-	-
NEW	50972	-	.7500	3/4"	19.050	3/4"	4"	1-3/4"	.3125"	-	-

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MATERIAL HARDNESS (Rc)

0

continued →

Series V4S, V4R, V4B (continued)

.7500" - .7874"
(19.050 - 20.000mm)

EDP#		$d1$ †			$d2$	$l1$	$l2$	r	$l3$	$d3$
(plain)	(weldon)	Decimal	Diameter	Metric	Shank Diameter	Overall Length	Flute Length	Corner Radius	Reach Length	Neck Diameter
	50553	50554	.7500	3/4"	19.050	3/4"	5"	2-1/8"	-	-
NEW	50973	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.010"	-
NEW	50974	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.015"	-
NEW	50975	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.020"	-
NEW	50976	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.030"	-
NEW	50977	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.060"	-
NEW	50978	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.090"	-
NEW	50979	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.120"	-
NEW	50980	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.125"	-
NEW	50981	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.156"	-
NEW	50982	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.190"	-
NEW	50983	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.250"	-
NEW	50984	-	.7500	3/4"	19.050	3/4"	5"	2-1/8"	.3125"	-
NEW	50672	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	-	-
NEW	50985	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.010"	-
NEW	50986	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.015"	-
NEW	50987	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.020"	-
NEW	50988	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.030"	-
NEW	50989	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.060"	-
NEW	50990	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.090"	-
NEW	50991	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.120"	-
NEW	50992	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.125"	-
NEW	50993	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.156"	-
NEW	50994	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.190"	-
NEW	50995	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.250"	-
NEW	50996	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	.3125"	-
NEW	50703	-	.7500	3/4"	19.050	3/4"	5"	2-1/2"	BALL	-
	50555	-	.7874		20.000	20.0	100	25	-	-
	50249	50289	.7874		20.000	20.0	100	38	-	-
NEW	50997	-	.7874		20.000	20.0	100	38	0.50	-
	50528	-	.7874		20.000	20.0	100	38	1.00	-
	50530	-	.7874		20.000	20.0	100	38	2.00	-
NEW	50998	-	.7874		20.000	20.0	100	38	2.50	-
	50532	-	.7874		20.000	20.0	100	38	3.00	-
NEW	50999	-	.7874		20.000	20.0	100	38	4.00	-
NEW	50121	-	.7874		20.000	20.0	100	38	5.00	-
NEW	50122	-	.7874		20.000	20.0	100	38	6.00	-
NEW	50123	-	.7874		20.000	20.0	100	38	8.00	-
	50265	50297	.7874		20.000	20.0	100	38	BALL	-
NEW	50673	-	.7874		20.000	20.0	100	48	-	-
NEW	50124	-	.7874		20.000	20.0	100	48	0.50	-
NEW	50125	-	.7874		20.000	20.0	100	48	1.00	-
NEW	50126	-	.7874		20.000	20.0	100	48	1.50	-
NEW	50127	-	.7874		20.000	20.0	100	48	2.00	-
NEW	50128	-	.7874		20.000	20.0	100	48	2.50	-
NEW	50129	-	.7874		20.000	20.0	100	48	3.00	-
NEW	50131	-	.7874		20.000	20.0	100	48	4.00	-
NEW	50132	-	.7874		20.000	20.0	100	48	5.00	-
NEW	50133	-	.7874		20.000	20.0	100	48	6.00	-
NEW	50134	-	.7874		20.000	20.0	100	48	8.00	-
NEW	50704	-	.7874		20.000	20.0	100	48	BALL	-

	EDP#		$d1$ †			$d2$	$l1$	$l2$	r	$l3$	$d3$
	(plain)	(weldon)	Decimal	Diameter	Metric	Shank Diameter	Overall Length	Flute Length	Corner Radius	Reach Length	Neck Diameter
NEW	50674	-	.7874		20.000	20.0	150	60	-	-	-
NEW	50135	-	.7874		20.000	20.0	150	60	0.50	-	-
NEW	50136	-	.7874		20.000	20.0	150	60	1.00	-	-
NEW	50137	-	.7874		20.000	20.0	150	60	3.00	-	-
NEW	50138	-	.7874		20.000	20.0	150	60	6.00	-	-
NEW	50705	-	.7874		20.000	20.0	150	60	BALL	-	-
	50250	50290	1.000	1"	25.400	1"	4"	1-1/2"	-	-	-
NEW	50139	-	1.000	1"	25.400	1"	4"	1-1/2"	.020"		
	50233	50281	1.000	1"	25.400	1"	4"	1-1/2"	.030"	-	-
NEW	50141	-	1.000	1"	25.400	1"	4"	1-1/2"	.060"	-	-
NEW	50142	-	1.000	1"	25.400	1"	4"	1-1/2"	.090"	-	-
NEW	50143	-	1.000	1"	25.400	1"	4"	1-1/2"	.120"	-	-
	50557	-	1.000	1"	25.400	1"	4"	1-1/2"	.125"	-	-
NEW	50144	-	1.000	1"	25.400	1"	4"	1-1/2"	.156"	-	-
NEW	50145	-	1.000	1"	25.400	1"	4"	1-1/2"	.190"	-	-
NEW	50146	-	1.000	1"	25.400	1"	4"	1-1/2"	.250"	-	-
NEW	50147	-	1.000	1"	25.400	1"	4"	1-1/2"	.3125"	-	-
NEW	50148	-	1.000	1"	25.400	1"	4"	1-1/2"	.375"	-	-
	50266	50298	1.000	1"	25.400	1"	4"	1-1/2"	BALL	-	-
NEW	50675	-	1.000	1"	25.400	1"	4-1/2"	2"	-	-	-
NEW	50149	-	1.000	1"	25.400	1"	4-1/2"	2"	.020"		
NEW	50151	-	1.000	1"	25.400	1"	4-1/2"	2"	.030"	-	-
NEW	50152	-	1.000	1"	25.400	1"	4-1/2"	2"	.060"	-	-
NEW	50153	-	1.000	1"	25.400	1"	4-1/2"	2"	.090"	-	-
NEW	50154	-	1.000	1"	25.400	1"	4-1/2"	2"	.120"	-	-
NEW	50155	-	1.000	1"	25.400	1"	4-1/2"	2"	.156"	-	-
NEW	50156	-	1.000	1"	25.400	1"	4-1/2"	2"	.190"	-	-
NEW	50157	-	1.000	1"	25.400	1"	4-1/2"	2"	.250"	-	-
NEW	50158	-	1.000	1"	25.400	1"	4-1/2"	2"	.3125"	-	-
NEW	50706	-	1.000	1"	25.400	1"	4-1/2"	2"	BALL	-	-
	50234	50282	1.000	1"	25.400	1"	5"	2-1/8"	.030"	-	-
NEW	50676	-	1.000	1"	25.400	1"	5"	2-1/2"	-	-	-
NEW	50159	-	1.000	1"	25.400	1"	5"	2-1/2"	.020"	-	-
NEW	50161	-	1.000	1"	25.400	1"	5"	2-1/2"	.030"	-	-
NEW	50162	-	1.000	1"	25.400	1"	5"	2-1/2"	.060"	-	-
NEW	50163	-	1.000	1"	25.400	1"	5"	2-1/2"	.090"	-	-
NEW	50164	-	1.000	1"	25.400	1"	5"	2-1/2"	.120"	-	-
NEW	50165	-	1.000	1"	25.400	1"	5"	2-1/2"	.156"	-	-
NEW	50166	-	1.000	1"	25.400	1"	5"	2-1/2"	.190"	-	-
NEW	50167	-	1.000	1"	25.400	1"	5"	2-1/2"	.250"	-	-
NEW	50168	-	1.000	1"	25.400	1"	5"	2-1/2"	.3125"	-	-
NEW	50707	-	1.000	1"	25.400	1"	5"	2-1/2"	BALL	-	-

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MATERIAL HARDNESS (Rc)

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VAN CUTSEM tools
Quality tools for metalworking

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GARR TOOL High Performance Milling Guide for V4

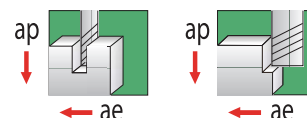
(High Efficiency Milling)

NOTE - DATA DOES NOT REFLECT CHIP THINNING. SEE GARR TOOL'S NEW CALCULATOR ON OUR WEBSITE.

SPINDLE INTERFACE MUST BE SCRUTINIZED WHEN USING 16mm DIAMETER AND LARGER END MILLS

ISO Material		HRC	M/Min. (Vc)	CHIPLOAD PER TOOTH (Fz)							
				6,0mm	8,0mm	10,0mm	12,0mm	16,0mm	20,0mm	25,0mm	
S	COBALT BASE ALLOYS / Kobaltlegierungen / Aleaciones del cobalto / Alliages de cobalt / Leghe del cobalto / 钴基合金										
	Haynes 25/188, Stellite 21, Cobalt Chrome	< 40 > 40	27 - 57 25 - 45	0,020 - 0,038 0,015 - 0,033	0,023 - 0,046 0,018 - 0,041	0,028 - 0,056 0,023 - 0,051	0,041 - 0,076 0,030 - 0,066	0,046 - 0,091 0,036 - 0,081	0,056 - 0,112 0,046 - 0,102	0,081 - 0,152 0,061 - 0,132	
	NICKEL BASE ALLOYS / Nickellegierungen / Aleaciones de níquel / Alliage de nickel / Leghe di nickel / 镍基合金										
	Inconel-625/718, Waspaloy, Invar, Rene, Hastelloy, Monel	< 40 > 40	27 - 57 25 - 45	0,020 - 0,038 0,015 - 0,033	0,023 - 0,046 0,018 - 0,041	0,028 - 0,056 0,023 - 0,051	0,041 - 0,076 0,030 - 0,066	0,046 - 0,091 0,036 - 0,081	0,056 - 0,112 0,046 - 0,102	0,081 - 0,152 0,061 - 0,132	
	IRON BASE ALLOYS / Eisenlegierungen / Aleaciones ferrosas / Alliages ferreux / Leghe ferrose / 铁基合金										
	A286, Discaloy, Haynes 556, Carpenter 22, Greek Ascology	< 40 > 40	27 - 57 25 - 45	0,020 - 0,038 0,015 - 0,033	0,023 - 0,046 0,018 - 0,041	0,028 - 0,056 0,023 - 0,051	0,041 - 0,076 0,030 - 0,066	0,046 - 0,091 0,036 - 0,081	0,056 - 0,112 0,046 - 0,102	0,081 - 0,152 0,061 - 0,132	
	TITANIUM ALLOYS / Titanlegierungen / Aleaciones de Titanio / Alliage de Titane / Leghe di Titanio / 钛合金										
	Commercially Pure, 6Al-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si		60 - 115	0,023 - 0,043	0,025 - 0,051	0,030 - 0,061	0,046 - 0,086	0,051 - 0,102	0,061 - 0,122	0,091 - 0,173	
	5553 / Beta Titanium		45 - 85	0,023 - 0,038	0,025 - 0,046	0,030 - 0,056	0,046 - 0,076	0,051 - 0,091	0,061 - 0,112	0,081 - 0,152	
	M	STAINLESS STEELS / Rostfreie Stähle / Acero Inoxidable / Acier Inoxydable / Acciaio Inox / 不锈钢合金									
13/8, 15/5, 17-4, pH Types		< 40 > 40	70 - 115 55 - 85	0,020 - 0,038 0,015 - 0,033	0,023 - 0,046 0,018 - 0,041	0,028 - 0,056 0,023 - 0,051	0,041 - 0,076 0,030 - 0,066	0,046 - 0,091 0,036 - 0,081	0,056 - 0,112 0,046 - 0,102	0,081 - 0,152 0,061 - 0,132	
300 Series, 304L, Nitronic 50, Duplex, Super-Austenitic		< 40 > 40	75 - 120 55 - 85	0,020 - 0,038 0,015 - 0,033	0,023 - 0,046 0,018 - 0,041	0,028 - 0,056 0,023 - 0,051	0,041 - 0,076 0,030 - 0,066	0,046 - 0,091 0,036 - 0,081	0,056 - 0,112 0,046 - 0,102	0,081 - 0,152 0,061 - 0,132	
400 Series - 403, 405, 420, 455		< 40 > 40	70 - 130 55 - 100	0,020 - 0,041 0,015 - 0,036	0,023 - 0,048 0,018 - 0,043	0,028 - 0,058 0,023 - 0,053	0,041 - 0,081 0,030 - 0,071	0,046 - 0,097 0,036 - 0,086	0,056 - 0,117 0,046 - 0,107	0,081 - 0,163 0,061 - 0,142	
HIGH STRENGTH TOOL STEELS / Hochfeste Werkzeugstähle / Herramienta aceros de alto dureza / Aciers à outils à haute résistance / Acciaio da utensili molto duro / 高强度工具钢											
A2, D2, P20, H13, S7, O1		< 40 > 40	70 - 120 45 - 100	0,020 - 0,041 0,015 - 0,033	0,028 - 0,048 0,025 - 0,041	0,033 - 0,058 0,030 - 0,051	0,041 - 0,081 0,030 - 0,066	0,056 - 0,097 0,051 - 0,081	0,066 - 0,142 0,061 - 0,102	0,102 - 0,163 0,091 - 0,132	
P	MEDIUM ALLOY TOOL STEELS / Mittel Legierte Werkzeugstähle / Aceros herramienta medios de la aleación / Aciers à outils alliés / Acciaio da utensili di media durezza / 中碳合金钢										
	4140, 4340, 52100, 6150, 8620	< 40 > 40	110 - 150 75 - 115	0,020 - 0,043 0,015 - 0,036	0,028 - 0,051 0,025 - 0,043	0,033 - 0,061 0,030 - 0,051	0,041 - 0,086 0,030 - 0,071	0,056 - 0,102 0,051 - 0,086	0,066 - 0,122 0,061 - 0,102	0,102 - 0,173 0,091 - 0,142	
	CARBON STEELS / Kohlenstoffstahl / Acero de carbón / Acier du carbone / Acciaio al carbonio / 碳钢										
	1000's - 1018, 1020, 12L14	< 40	115 - 180	0,025 - 0,046	0,028 - 0,053	0,033 - 0,064	0,051 - 0,091	0,056 - 0,107	0,066 - 0,127	0,102 - 0,183	
K	CAST MATERIAL / Gegossenes Material / Material bastidor vertidos / Matériaux fontes / Materiale fuso / 铸造件										
	Ductile Iron		110 - 160	0,025 - 0,046	0,033 - 0,056	0,038 - 0,066	0,051 - 0,091	0,066 - 0,112	0,076 - 0,132	0,102 - 0,183	
	Gray Iron		135 - 180	0,028 - 0,051	0,036 - 0,058	0,041 - 0,069	0,056 - 0,102	0,071 - 0,117	0,081 - 0,137	0,112 - 0,203	

	Slotting Pocket Milling	Profiling Side Milling
Axial (ap)	up to 1.5xD	up to 2xD
Radial (ae)	1xD	5% - 15% of Dia.



NOTE - ABOVE ARE STARTING PARAMETERS ONLY. HIGHER RESULTS MAY BE ACHIEVED WITH OPTIMUM CONDITIONS.