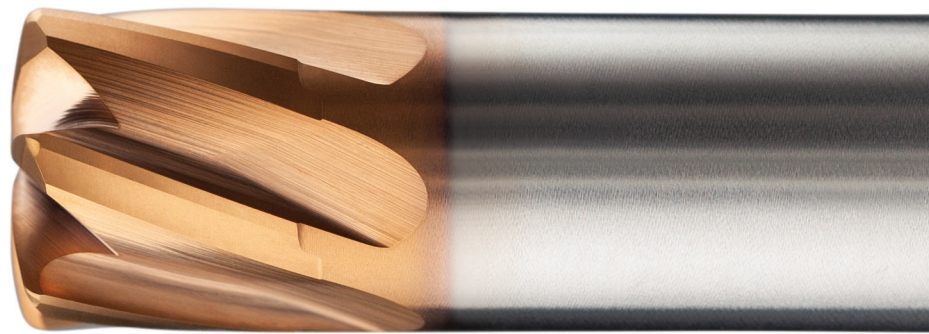




 **OSAWA**
SORMA CUTTING SOLUTIONS



OSW23 UPDATE
·SEPTEMBER·



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CARBIDE DRILLS

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TYPHOON CV

HIGH PERFORMANCE - GENERAL PURPOSE

🇬🇧 The tool of choice for multi-purpose drilling on ISO P, M, K, N below 1100 N/mm².

🇮🇹 La soluzione ideale per la foratura di materiali ISO P, M, K, N sino a 1100 N/mm².

🇩🇪 Die optimale Lösung für das Bohren der Materialien ISO P, M, K, N bis zu 1100 N/mm².

🇫🇷 La solution idéale pour le perçage de matériaux ISO P, M, K, N jusqu'à 1100 N/mm².

🇪🇸 La solución ideal para el taladrado de materiales ISO P, M, K, N hasta 1100 N/mm².

🇷🇺 Идеальное решение для сверления материалов по ISO P, M, K, N до 1100 Н/мм².



- Unique split point: reduces thrust, provides better self centering
- Split gash design: low drilling resistance and short chips for easier ejection
- Optimized Chisel: long and stable tool life
- Wide flutes by new grinding technology: smooth chips ejection
- Special curved edge design: reduces cutting force
- Small chamfer: reduces corner chipping problem
- Special edge treatment: extends tool life



- Point de séparation unique: réduit la poussée, permet un meilleur auto-centrage.
- Grande goujure centrale: faible résistance au perçage et copeaux courts pour une éjection plus facile
- Arête de coupe transversale optimisée : durée de vie de l'outil longue et stable
- Des goujures larges grâce à une nouvelle technologie de meulage : éjection des copeaux optimale
- Conception spéciale de l'arête avec bord incurvé : réduit la force de coupe
- Petit chanfrein : réduit les problèmes d'écaillage dans les coins
- Traitement spécial des arêtes : prolonge la durée de vie de l'outil



- Affilatura a croce: riduce lo sforzo di taglio e migliora la capacità di centraggio
- Ampio scarico frontale: basso sforzo di taglio e trucioli corti per evacuazione più efficiente
- Tagliente trasversale ottimizzato: incremento durata e affidabilità
- Gole più ampie grazie alla nuova tecnologia di affilatura: ottima evacuazione dei trucioli
- Tagliente curvilineo: Riduce lo sforzo di taglio
- Smusso per protezione degli spigoli: riduzione dei problemi di scheggiatura
- Onatura precisa: maggiore durata dell'utensile



- Afilado a cruz: reduce el esfuerzo de corte y mejora el autocentrado
- Amplio descargue frontal: evacuación de viruta más eficiente gracias a bajos esfuerzos de corte y generación de viruta corta
- Filo de corte transversal mejorado Aumento de la vida útil y fiabilidad
- Ranuras más anchas gracias a la nueva tecnología de afilado: Excelente evacuación de viruta
- Filo de corte curvilíneo Reduce el esfuerzo de corte
- Chafflán para protección de los bordes: Reducción de problemas de astillado
- Tratamiento especial del filo: aumenta la vida útil de la herramienta



- Kreuzanschliff: reduziert die Schnittkraft und verbessert die Zentrierung
- Grosse Freifläche auf der Spitze: Geringer Bohrwiderstand und kurze Späne für eine effizientere Spanabfuhr
- Optimierte Querkante: Verbesserte Standzeit und Leistung
- Größere Nuten, dank einer neuen Schleiftechnologie: optimale Spanabfuhr
- Gekurvte Schneide: Reduzierter Schneidaufwand
- Kantenschutz: vermindert Absplitterungen
- Spezieller Kantenschnitt: Verlängerte Standzeit



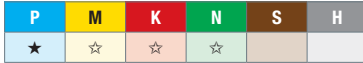
- Крестовая заточка: Снижает усилие резания и улучшает центрирование
- Дизайн режущей части: Низкое усилие резания и короткая стружка для более эффективного удаления
- Оптимизированная поперечная режущая кромка: Повышенная долговечность и надежность
- Более широкие канавки благодаря новой технологии заточки: Превосходное удаление стружки
- Криволинейная режущая кромка: Снижает усилие резания
- Фаска для защиты кромки: Уменьшает проблему сколов кромки
- Специальная обработка края: Более продолжительный срок службы инструмента

353CV

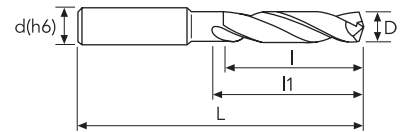
General purpose



353CV replaces 343TA.
353CV will be gradually available as soon as 343TA stock is phased out



★ 1st choice ☆ suitable



D(m7)	D Tol.	d(h6)	l	l1	L	EDP No.	Stock
1.00	+0.012/+0.002	3	5	7	45	353CV0100	●
1.10	+0.012/+0.002	3	5	7	45	353CV0110	●
1.20	+0.012/+0.002	3	5	7	45	353CV0120	●
1.30	+0.012/+0.002	3	5	7	45	353CV0130	●
1.40	+0.012/+0.002	3	5	7	45	353CV0140	●
1.50	+0.012/+0.002	3	10	13	50	353CV0150	●
1.60	+0.012/+0.002	3	10	13	50	353CV0160	●
1.70	+0.012/+0.002	3	10	13	50	353CV0170	●
1.80	+0.012/+0.002	3	10	13	50	353CV0180	●
1.90	+0.012/+0.002	3	10	13	50	353CV0190	●
2.00	+0.012/+0.002	4	12	17	55	353CV0200	●
2.10	+0.012/+0.002	4	12	17	55	353CV0210	●
2.20	+0.012/+0.002	4	12	17	55	353CV0220	●
2.30	+0.012/+0.002	4	12	17	55	353CV0230	●
2.40	+0.012/+0.002	4	12	17	55	353CV0240	●
2.50	+0.012/+0.002	4	12	17	55	353CV0250	●
2.60	+0.012/+0.002	4	12	17	55	353CV0260	●
2.70	+0.012/+0.002	4	12	17	55	353CV0270	●
2.80	+0.012/+0.002	4	12	17	55	353CV0280	●
2.90	+0.012/+0.002	4	12	17	55	353CV0290	●
3.00	+0.012/+0.002	6	14	20	62	353CV0300	●
3.10	+0.016/+0.004	6	14	20	62	353CV0310	●
3.20	+0.016/+0.004	6	14	20	62	353CV0320	●
3.30	+0.016/+0.004	6	14	20	62	353CV0330	●
3.40	+0.016/+0.004	6	14	20	62	353CV0340	●
3.50	+0.016/+0.004	6	14	20	62	353CV0350	●
3.60	+0.016/+0.004	6	14	20	62	353CV0360	●
3.70	+0.016/+0.004	6	14	20	62	353CV0370	●
3.80	+0.016/+0.004	6	17	24	66	353CV0380	●
3.90	+0.016/+0.004	6	17	24	66	353CV0390	●
4.00	+0.016/+0.004	6	17	24	66	353CV0400	●
4.10	+0.016/+0.004	6	17	24	66	353CV0410	●
4.20	+0.016/+0.004	6	17	24	66	353CV0420	●
4.30	+0.016/+0.004	6	17	24	66	353CV0430	●
4.40	+0.016/+0.004	6	17	24	66	353CV0440	●
4.50	+0.016/+0.004	6	17	24	66	353CV0450	●
4.60	+0.016/+0.004	6	17	24	66	353CV0460	●
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4.80	+0.016/+0.004	6	20	28	66	353CV0480	●

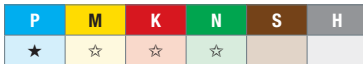
● stock standard ○ non-standard stock ▽ stock exhaustion

353CV

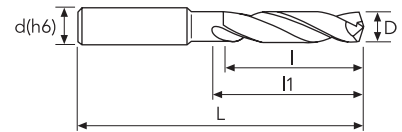
General purpose



353CV replaces 343TA.
353CV will be gradually available as soon as 343TA stock is phased out



★ 1st choice ☆ suitable



D(m7)	D Tol.	d(h6)	l	l1	L	EDP No.	Stock
4.90	+0.016/+0.004	6	20	28	66	353CV0490	●
5.00	+0.016/+0.004	6	20	28	66	353CV0500	●
5.10	+0.016/+0.004	6	20	28	66	353CV0510	●
5.20	+0.016/+0.004	6	20	28	66	353CV0520	●
5.30	+0.016/+0.004	6	20	28	66	353CV0530	●
5.40	+0.016/+0.004	6	20	28	66	353CV0540	●
5.50	+0.016/+0.004	6	20	28	66	353CV0550	●
5.60	+0.016/+0.004	6	20	28	66	353CV0560	●
5.70	+0.016/+0.004	6	20	28	66	353CV0570	●
5.80	+0.016/+0.004	6	20	28	66	353CV0580	●
5.90	+0.016/+0.004	6	20	28	66	353CV0590	●
6.00	+0.016/+0.004	6	20	28	66	353CV0600	●
6.10	+0.021/+0.006	8	24	34	79	353CV0610	●
6.20	+0.021/+0.006	8	24	34	79	353CV0620	●
6.30	+0.021/+0.006	8	24	34	79	353CV0630	●
6.40	+0.021/+0.006	8	24	34	79	353CV0640	●
6.50	+0.021/+0.006	8	24	34	79	353CV0650	●
6.60	+0.021/+0.006	8	24	34	79	353CV0660	●
6.70	+0.021/+0.006	8	24	34	79	353CV0670	●
6.80	+0.021/+0.006	8	24	34	79	353CV0680	●
6.90	+0.021/+0.006	8	24	34	79	353CV0690	●
7.00	+0.021/+0.006	8	24	34	79	353CV0700	●
7.10	+0.021/+0.006	8	29	41	79	353CV0710	●
7.20	+0.021/+0.006	8	29	41	79	353CV0720	●
7.30	+0.021/+0.006	8	29	41	79	353CV0730	●
7.40	+0.021/+0.006	8	29	41	79	353CV0740	●
7.50	+0.021/+0.006	8	29	41	79	353CV0750	●
7.60	+0.021/+0.006	8	29	41	79	353CV0760	●
7.70	+0.021/+0.006	8	29	41	79	353CV0770	●
7.80	+0.021/+0.006	8	29	41	79	353CV0780	●
7.90	+0.021/+0.006	8	29	41	79	353CV0790	●
8.00	+0.021/+0.006	8	29	41	79	353CV0800	●
8.10	+0.021/+0.006	10	35	47	89	353CV0810	●
8.20	+0.021/+0.006	10	35	47	89	353CV0820	●
8.30	+0.021/+0.006	10	35	47	89	353CV0830	●
8.40	+0.021/+0.006	10	35	47	89	353CV0840	●
8.50	+0.021/+0.006	10	35	47	89	353CV0850	●
8.60	+0.021/+0.006	10	35	47	89	353CV0860	●
8.70	+0.021/+0.006	10	35	47	89	353CV0870	●

● stock standard ○ non-standard stock ▽ stock exhaustion

353CV

	Material Group ISO 513	P1 P2 P3	P7	M1	K1	N1 N2	
	Hardness/Rm	<800 N/mm ²	<700 N/mm ²	<750 N/mm ²	150÷200 HB		
Vc (m/min)	80+100	35+45	35+45	80+100	140+180		
D (mm)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	
1	0.050	0.035	0.035	0.050	0.065		
2	0.070	0.049	0.049	0.070	0.091		
3	0.086	0.060	0.060	0.086	0.112		
4	0.126	0.088	0.088	0.126	0.164		
5	0.131	0.092	0.092	0.131	0.170		
6	0.145	0.102	0.102	0.145	0.189		
7	0.165	0.116	0.116	0.165	0.215		
8	0.185	0.130	0.130	0.185	0.241		
9	0.205	0.144	0.144	0.205	0.267		
10	0.224	0.157	0.157	0.224	0.291		
11	0.244	0.171	0.171	0.244	0.317		
12	0.263	0.184	0.184	0.263	0.342		
13	0.282	0.197	0.197	0.282	0.367		
14	0.302	0.211	0.211	0.302	0.393		
15	0.315	0.221	0.221	0.315	0.410		
16	0.336	0.235	0.235	0.336	0.437		





TYPHOON GA-HGA

HIGH PERFORMANCE - GENERAL APPLICATION

🇬🇧 3xD, 5xD and 8xD with Weldon shank for general application on ISO P, M, K

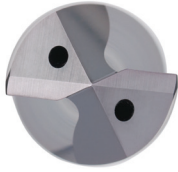
🇮🇹 3xD, 5xD e 8xD con gambo weldon per applicazioni generali su ISO P, M, K.

🇩🇪 3xD, 5xD und 8xD mit Weldon Schaft für allgemeine Anwendung auf ISO P, M, K

🇫🇷 3xD, 5xD et 8xD avec tige Weldon pour application générale sur ISO P, M, K

🇪🇸 3xD, 5xD y 8xD con mango Weldon para aplicación general en ISO P, M, K

🇷🇺 3xD, 5xD и 8xD с хвостовиком Weldon для общего применения по ISO P, M, K.



- Self-centering geometry: accurate holes
- Made of sub-micron grain carbide and new PV400 coating for better wear resistance (lower cost per hole).
- Straight cutting edge design and unique edge treatment technology allow higher reliability.
- Optimized core diameter guarantees the straightness of the hole and wide flutes design allows smooth chip ejection



- Géométrie auto-centrée pour trous précis
- Fabriqué en carbure à grains submicroniques et nouveau revêtement PV400 pour une meilleure résistance à l'usure (coût inférieur par trou).
- La conception du bord droit et la technologie unique de traitement des bords permettent une plus grande fiabilité.
- Le diamètre optimisé du noyau garantit la rectitude du trou et la conception de cannelures larges permet une éjection en douceur des copeaux.



- Affilatura autocentrante per fori precisi
- In metallo duro con grano sub-micron e nuovo rivestimento PV400 per migliore resistenza all'usura (inferiore costo per foro)
- Tagliente diritto e esclusivo processo di onatura del bordo per elevata affidabilità
- Il diametro del nocciolo ottimizzato assicura la realizzazione di fori dritti; le scanalature ampie, garantiscono migliore evacuazione dei trucioli



- Afilado autocentrante para agujeros precisos
- Hecho de carburo de grano submicrónico y nuevo recubrimiento PV400 para una mayor resistencia al desgaste (menor costo por agujero).
- El diseño de filo de corte recto y la tecnología única de tratamiento de filo dan una mayor estabilidad.
- El diámetro del núcleo optimizado garantiza la rectitud del agujero y el diseño de ranuras anchas permiten una expulsión suave de la viruta.



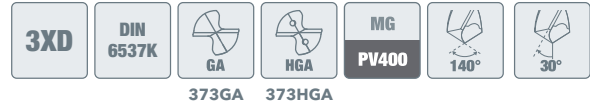
- Selbstzentrierender Schliff für präzise Bohrungen
- Aus VHM Mikrokörnung und neue PV400 Beschichtung um bessere Verschleissbeständigkeit zu ermöglichen.
- Gerades Schnittkantendesign und optimaler Schliff für eine hohe Zuverlässigkeit des Werkzeugs.
- Optimierter Kerndurchmesser für gerade Bohrungen, breite Spannuten zur Verbesserung der Spanabfuhr.



- Самоцентрирующаяся заточка для получения точных отверстий
- Изготовлены из твёрдого сплава с субмикронным зерном и новым покрытием PV400 для лучшей износостойкости (более низкая стоимость отверстия).
- Прямая режущая кромка и уникальная технология обработки кромок обеспечивают более высокую надежность.
- Оптимизированный диаметр сердцевины гарантирует прямолинейность отверстия, а конструкция с широкими канавками обеспечивает беспрепятственный выброс стружки.

373GA-HGA

General application, Weldon shank



373GA



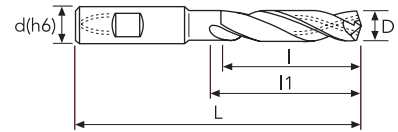
373HGA

P	M	K	N	S	H
★	☆	★			
★	★	★			

373GA

373HGA

★ 1st choice ☆ suitable

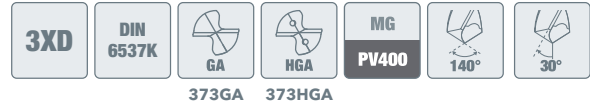


D(m7)	D Tol.	d(h6)	l	l1	L	373GA EDP No.	Stock	373HGA EDP No.	Stock
3.0	+0.004/+0.016	6	14	20	62	373GA0300	●	373HGA0300	●
3.1	+0.004/+0.016	6	14	20	62	373GA0310	●	373HGA0310	●
3.2	+0.004/+0.016	6	14	20	62	373GA0320	●	373HGA0320	●
3.3	+0.004/+0.016	6	14	20	62	373GA0330	●	373HGA0330	●
3.4	+0.004/+0.016	6	14	20	62	373GA0340	●	373HGA0340	●
3.5	+0.004/+0.016	6	14	20	62	373GA0350	●	373HGA0350	●
3.6	+0.004/+0.016	6	14	20	62	373GA0360	●	373HGA0360	●
3.7	+0.004/+0.016	6	14	20	62	373GA0370	●	373HGA0370	●
3.8	+0.004/+0.016	6	17	24	66	373GA0380	●	373HGA0380	●
3.9	+0.004/+0.016	6	17	24	66	373GA0390	●	373HGA0390	●
4.0	+0.004/+0.016	6	17	24	66	373GA0400	●	373HGA0400	●
4.1	+0.004/+0.016	6	17	24	66	373GA0410	●	373HGA0410	●
4.2	+0.004/+0.016	6	17	24	66	373GA0420	●	373HGA0420	●
4.3	+0.004/+0.016	6	17	24	66	373GA0430	●	373HGA0430	●
4.4	+0.004/+0.016	6	17	24	66	373GA0440	●	373HGA0440	●
4.5	+0.004/+0.016	6	17	24	66	373GA0450	●	373HGA0450	●
4.6	+0.004/+0.016	6	17	24	66	373GA0460	●	373HGA0460	●
4.7	+0.004/+0.016	6	17	24	66	373GA0470	●	373HGA0470	●
4.8	+0.004/+0.016	6	20	28	66	373GA0480	●	373HGA0480	●
4.9	+0.004/+0.016	6	20	28	66	373GA0490	●	373HGA0490	●
5.0	+0.004/+0.016	6	20	28	66	373GA0500	●	373HGA0500	●
5.1	+0.004/+0.016	6	20	28	66	373GA0510	●	373HGA0510	●
5.2	+0.004/+0.016	6	20	28	66	373GA0520	●	373HGA0520	●
5.3	+0.004/+0.016	6	20	28	66	373GA0530	●	373HGA0530	●
5.4	+0.004/+0.016	6	20	28	66	373GA0540	●	373HGA0540	●
5.5	+0.004/+0.016	6	20	28	66	373GA0550	●	373HGA0550	●
5.6	+0.004/+0.016	6	20	28	66	373GA0560	●	373HGA0560	●
5.7	+0.004/+0.016	6	20	28	66	373GA0570	●	373HGA0570	●
5.8	+0.004/+0.016	6	20	28	66	373GA0580	●	373HGA0580	●
5.9	+0.004/+0.016	6	20	28	66	373GA0590	●	373HGA0590	●
6.0	+0.004/+0.016	6	20	28	66	373GA0600	●	373HGA0600	●
6.1	+0.006/+0.021	8	24	34	79	373GA0610	●	373HGA0610	●
6.2	+0.006/+0.021	8	24	34	79	373GA0620	●	373HGA0620	●
6.3	+0.006/+0.021	8	24	34	79	373GA0630	●	373HGA0630	●
6.4	+0.006/+0.021	8	24	34	79	373GA0640	●	373HGA0640	●
6.5	+0.006/+0.021	8	24	34	79	373GA0650	●	373HGA0650	●
6.6	+0.006/+0.021	8	24	34	79	373GA0660	●	373HGA0660	●
6.7	+0.006/+0.021	8	24	34	79	373GA0670	●	373HGA0670	●
6.8	+0.006/+0.021	8	24	34	79	373GA0680	●	373HGA0680	●

● stock standard ○ non-standard stock

373GA-HGA

General application, Weldon shank



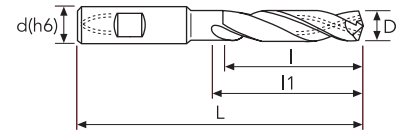
373GA



373HGA

P	M	K	N	S	H	
★	☆	★				373GA
★	★	★				373HGA

★ 1st choice ☆ suitable

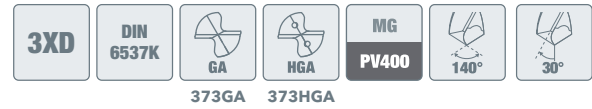


D(m7)	D Tol.	d(h6)	l	l1	L	373GA EDP No.	Stock	373HGA EDP No.	Stock
6.9	+0.006/+0.021	8	24	34	79	373GA0690	●	373HGA0690	●
7.0	+0.006/+0.021	8	24	34	79	373GA0700	●	373HGA0700	●
7.1	+0.006/+0.021	8	29	41	79	373GA0710	●	373HGA0710	●
7.2	+0.006/+0.021	8	29	41	79	373GA0720	●	373HGA0720	●
7.3	+0.006/+0.021	8	29	41	79	373GA0730	●	373HGA0730	●
7.4	+0.006/+0.021	8	29	41	79	373GA0740	●	373HGA0740	●
7.5	+0.006/+0.021	8	29	41	79	373GA0750	●	373HGA0750	●
7.6	+0.006/+0.021	8	29	41	79	373GA0760	●	373HGA0760	●
7.7	+0.006/+0.021	8	29	41	79	373GA0770	●	373HGA0770	●
7.8	+0.006/+0.021	8	29	41	79	373GA0780	●	373HGA0780	●
7.9	+0.006/+0.021	8	29	41	79	373GA0790	●	373HGA0790	●
8.0	+0.006/+0.021	8	29	41	79	373GA0800	●	373HGA0800	●
8.1	+0.006/+0.021	10	35	47	89	373GA0810	●	373HGA0810	●
8.2	+0.006/+0.021	10	35	47	89	373GA0820	●	373HGA0820	●
8.3	+0.006/+0.021	10	35	47	89	373GA0830	●	373HGA0830	●
8.4	+0.006/+0.021	10	35	47	89	373GA0840	●	373HGA0840	●
8.5	+0.006/+0.021	10	35	47	89	373GA0850	●	373HGA0850	●
8.6	+0.006/+0.021	10	35	47	89	373GA0860	●	373HGA0860	●
8.7	+0.006/+0.021	10	35	47	89	373GA0870	●	373HGA0870	●
8.8	+0.006/+0.021	10	35	47	89	373GA0880	●	373HGA0880	●
8.9	+0.006/+0.021	10	35	47	89	373GA0890	●	373HGA0890	●
9.0	+0.006/+0.021	10	35	47	89	373GA0900	●	373HGA0900	●
9.1	+0.006/+0.021	10	35	47	89	373GA0910	●	373HGA0910	●
9.2	+0.006/+0.021	10	35	47	89	373GA0920	●	373HGA0920	●
9.3	+0.006/+0.021	10	35	47	89	373GA0930	●	373HGA0930	●
9.4	+0.006/+0.021	10	35	47	89	373GA0940	●	373HGA0940	●
9.5	+0.006/+0.021	10	35	47	89	373GA0950	●	373HGA0950	●
9.6	+0.006/+0.021	10	35	47	89	373GA0960	●	373HGA0960	●
9.7	+0.006/+0.021	10	35	47	89	373GA0970	●	373HGA0970	●
9.8	+0.006/+0.021	10	35	47	89	373GA0980	●	373HGA0980	●
9.9	+0.006/+0.021	10	35	47	89	373GA0990	●	373HGA0990	●
10.0	+0.006/+0.021	10	35	47	89	373GA1000	●	373HGA1000	●
10.1	+0.007/+0.025	12	40	55	102	373GA1010	●	373HGA1010	●
10.2	+0.007/+0.025	12	40	55	102	373GA1020	●	373HGA1020	●
10.3	+0.007/+0.025	12	40	55	102	373GA1030	●	373HGA1030	●
10.4	+0.007/+0.025	12	40	55	102	373GA1040	●	373HGA1040	●
10.5	+0.007/+0.025	12	40	55	102	373GA1050	●	373HGA1050	●
10.6	+0.007/+0.025	12	40	55	102	373GA1060	●	373HGA1060	●
10.7	+0.007/+0.025	12	40	55	102	373GA1070	●	373HGA1070	●

● stock standard ○ non-standard stock

373GA-HGA

General application, Weldon shank



373GA



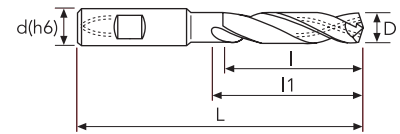
373HGA

P	M	K	N	S	H
★	☆	★			
★	★	★			

373GA

373HGA


★ 1st choice ☆ suitable




D(m7)	D Tol.	d(h6)	l	l1	L	373GA EDP No.	Stock	373HGA EDP No.	Stock
10.8	+0.007/+0.025	12	40	55	102	373GA1080	●	373HGA1080	●
10.9	+0.007/+0.025	12	40	55	102	373GA1090	●	373HGA1090	●
11.0	+0.007/+0.025	12	40	55	102	373GA1100	●	373HGA1100	●
11.1	+0.007/+0.025	12	40	55	102	373GA1110	●	373HGA1110	●
11.2	+0.007/+0.025	12	40	55	102	373GA1120	●	373HGA1120	●
11.3	+0.007/+0.025	12	40	55	102	373GA1130	●	373HGA1130	●
11.4	+0.007/+0.025	12	40	55	102	373GA1140	●	373HGA1140	●
11.5	+0.007/+0.025	12	40	55	102	373GA1150	●	373HGA1150	●
11.6	+0.007/+0.025	12	40	55	102	373GA1160	●	373HGA1160	●
11.7	+0.007/+0.025	12	40	55	102	373GA1170	●	373HGA1170	●
11.8	+0.007/+0.025	12	40	55	102	373GA1180	●	373HGA1180	●
11.9	+0.007/+0.025	12	40	55	102	373GA1190	●	373HGA1190	●
12.0	+0.007/+0.025	12	40	55	102	373GA1200	●	373HGA1200	●
12.1	+0.007/+0.025	14	43	60	107	373GA1210	○	373HGA1210	●
12.2	+0.007/+0.025	14	43	60	107	373GA1220	●	373HGA1220	●
12.3	+0.007/+0.025	14	43	60	107	373GA1230	○		
12.4	+0.007/+0.025	14	43	60	107	373GA1240	○		
12.5	+0.007/+0.025	14	43	60	107	373GA1250	●	373HGA1250	●
12.6	+0.007/+0.025	14	43	60	107	373GA1260	○		
12.7	+0.007/+0.025	14	43	60	107	373GA1270	●	373HGA1270	●
12.8	+0.007/+0.025	14	43	60	107	373GA1280	●	373HGA1280	●
12.9	+0.007/+0.025	14	43	60	107	373GA1290	○		
13.0	+0.007/+0.025	14	43	60	107	373GA1300	●	373HGA1300	●
13.5	+0.007/+0.025	14	43	60	107	373GA1350	●	373HGA1350	●
13.7	+0.007/+0.025	14	43	60	107	373GA1370	●	373HGA1370	○
13.8	+0.007/+0.025	14	43	60	107	373GA1380	●	373HGA1380	○
14.0	+0.007/+0.025	14	43	60	107	373GA1400	●	373HGA1400	●
14.2	+0.007/+0.025	16	45	65	115	373GA1420	●	373HGA1420	●
14.5	+0.007/+0.025	16	45	65	115	373GA1450	●	373HGA1450	●
14.7	+0.007/+0.025	16	45	65	115	373GA1470	●	373HGA1470	○
14.8	+0.007/+0.025	16	45	65	115	373GA1480	●	373HGA1480	●
15.0	+0.007/+0.025	16	49	65	115	373GA1500	●	373HGA1500	●
15.2	+0.007/+0.025	16	49	65	115	373GA1520	●	373HGA1520	●
15.3	+0.007/+0.025	16	49	65	115	373GA1530	●	373HGA1530	●
15.5	+0.007/+0.025	16	49	65	115	373GA1550	●	373HGA1550	●
15.7	+0.007/+0.025	16	49	65	115	373GA1570	●	373HGA1570	○
15.8	+0.007/+0.025	16	49	65	115	373GA1580	●	373HGA1580	●
16.0	+0.007/+0.025	16	49	65	115	373GA1600	●	373HGA1600	●
16.5	+0.007/+0.025	18	52	73	123	373GA1650	●	373HGA1650	●

● stock standard ○ non-standard stock


373GA

	Material Group ISO 513	P1	P2	P3 P4	P5 P6	P7	P8
	Hardness/Rm	<500 N/mm ²	500÷700 N/mm ²	600÷1000 N/mm ²	900÷1480 N/mm ²	<750 N/mm ²	850÷1200 N/mm ²
	Vc (m/min)	70÷90	60÷80	60÷80	50÷70	40÷60	35÷55
	D (mm)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)
3	0.143	0.143	0.124	0.105	0.076	0.057	
4	0.143	0.143	0.124	0.105	0.076	0.057	
6	0.181	0.181	0.162	0.133	0.114	0.095	
8	0.209	0.209	0.190	0.152	0.133	0.124	
10	0.209	0.209	0.190	0.152	0.133	0.124	
12	0.266	0.266	0.219	0.181	0.171	0.171	
14	0.304	0.304	0.238	0.209	0.190	0.190	
16	0.304	0.304	0.238	0.209	0.190	0.190	
18	0.361	0.361	0.285	0.228	0.228	0.228	
20	0.361	0.361	0.285	0.228	0.228	0.228	


373HGA

	Material Group ISO 513	P1	P2	P3 P4	P5 P6	P7	P8
	Hardness/Rm	<500 N/mm ²	500÷700 N/mm ²	600÷1000 N/mm ²	900÷1480 N/mm ²	<750 N/mm ²	850÷1200 N/mm ²
	Vc (m/min)	90÷110	70÷90	70÷90	50÷70	50÷70	40÷60
	D (mm)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)
3	0.150	0.150	0.130	0.110	0.080	0.060	
4	0.150	0.150	0.130	0.110	0.080	0.060	
6	0.190	0.190	0.170	0.140	0.120	0.100	
8	0.220	0.220	0.200	0.160	0.140	0.130	
10	0.220	0.220	0.200	0.160	0.140	0.130	
12	0.280	0.280	0.230	0.190	0.180	0.180	
14	0.320	0.320	0.250	0.220	0.200	0.200	
16	0.320	0.320	0.250	0.220	0.200	0.200	
18	0.380	0.380	0.300	0.240	0.240	0.240	
20	0.380	0.380	0.300	0.240	0.240	0.240	


373HGA

	Material Group ISO 513	M1	M2	M3			
	Hardness/Rm	<750 N/mm ²	550÷850 N/mm ²	650÷950 N/mm ²			
	Vc (m/min)	50÷70	50÷70	35÷55			
	D (mm)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)			
3	0.080	0.060	0.060				
4	0.100	0.080	0.080				
6	0.120	0.080	0.080				
8	0.130	0.100	0.100				
10	0.150	0.110	0.110				
12	0.170	0.130	0.130				
14	0.180	0.130	0.130				
16	0.200	0.140	0.140				
18	0.220	0.140	0.140				
20	0.240	0.160	0.160				

373GA

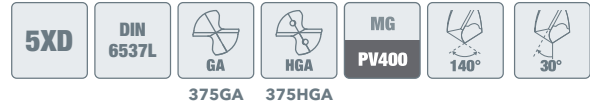
 Ø RUN OUT <0.02mm	Material Group ISO 513	K1	K2	K3			
	Hardness/Rm	150÷250 HB	150÷350 HB	120÷260 HB			
	Vc (m/min)	90÷110	70÷90	60÷80			
	D (mm)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)			
	3	0.162	0.143	0.086			
	4	0.190	0.162	0.095			
	6	0.238	0.190	0.124			
	8	0.257	0.238	0.152			
	10	0.285	0.266	0.190			
	12	0.314	0.285	0.209			
14	0.342	0.314	0.228				
16	0.380	0.333	0.247				
18	0.399	0.361	0.266				
20	0.428	0.380	0.266				

373HGA

 Ø RUN OUT <0.02mm	Material Group ISO 513	K1	K2	K3			
	Hardness/Rm	150÷250 HB	150÷350 HB	120÷260 HB			
	Vc (m/min)	110÷130	90÷110	70÷90			
	D (mm)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)			
	3	0.170	0.150	0.090			
	4	0.200	0.170	0.100			
	6	0.250	0.200	0.130			
	8	0.270	0.250	0.160			
	10	0.300	0.280	0.200			
	12	0.330	0.300	0.220			
14	0.360	0.330	0.240				
16	0.400	0.350	0.260				
18	0.420	0.380	0.280				
20	0.450	0.400	0.280				

375GA-HGA

General application, Weldon shank



375GA



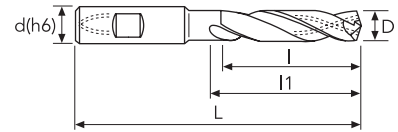
375HGA

P	M	K	N	S	H
★	☆	★			
★	★	★			

375GA

375HGA

★ 1st choice ☆ suitable



D(m7)	D Tol.	d(h6)	l	l1	L	375GA EDP No.	Stock	375HGA EDP No.	Stock
3.0	+0.004/+0.016	6	23,5	28	66	375GA0300	●	375HGA0300	●
3.1	+0.004/+0.016	6	23,4	28	66	375GA0310	●	375HGA0310	●
3.2	+0.004/+0.016	6	23,2	28	66	375GA0320	●	375HGA0320	●
3.3	+0.004/+0.016	6	23,1	28	66	375GA0330	●	375HGA0330	●
3.4	+0.004/+0.016	6	22,9	28	66	375GA0340	●	375HGA0340	●
3.5	+0.004/+0.016	6	22,8	28	66	375GA0350	●	375HGA0350	●
3.6	+0.004/+0.016	6	22,6	28	66	375GA0360	●	375HGA0360	●
3.7	+0.004/+0.016	6	22,5	28	66	375GA0370	●	375HGA0370	●
3.8	+0.004/+0.016	6	30,3	36	74	375GA0380	●	375HGA0380	●
3.9	+0.004/+0.016	6	30,2	36	74	375GA0390	●	375HGA0390	●
4.0	+0.004/+0.016	6	30,0	36	74	375GA0400	●	375HGA0400	●
4.1	+0.004/+0.016	6	29,9	36	74	375GA0410	●	375HGA0410	●
4.2	+0.004/+0.016	6	29,7	36	74	375GA0420	●	375HGA0420	●
4.3	+0.004/+0.016	6	29,6	36	74	375GA0430	●	375HGA0430	●
4.4	+0.004/+0.016	6	29,4	36	74	375GA0440	●	375HGA0440	●
4.5	+0.004/+0.016	6	29,3	36	74	375GA0450	●	375HGA0450	●
4.6	+0.004/+0.016	6	29,1	36	74	375GA0460	●	375HGA0460	●
4.65	+0.004/+0.016	6	29,0	36	74			375HGA0465	●
4.7	+0.004/+0.016	6	29,0	36	74	375GA0470	●	375HGA0470	●
4.8	+0.004/+0.016	6	36,8	44	82	375GA0480	●	375HGA0480	●
4.9	+0.004/+0.016	6	36,7	44	82	375GA0490	●	375HGA0490	●
5.0	+0.004/+0.016	6	36,5	44	82	375GA0500	●	375HGA0500	●
5.1	+0.004/+0.016	6	36,4	44	82	375GA0510	●	375HGA0510	●
5.2	+0.004/+0.016	6	36,2	44	82	375GA0520	●	375HGA0520	●
5.3	+0.004/+0.016	6	36,1	44	82	375GA0530	●	375HGA0530	●
5.4	+0.004/+0.016	6	35,9	44	82	375GA0540	●	375HGA0540	●
5.5	+0.004/+0.016	6	35,8	44	82	375GA0550	●	375HGA0550	●
5.55	+0.004/+0.016	6	35,7	44	82			375HGA0555	●
5.6	+0.004/+0.016	6	35,6	44	82	375GA0560	●	375HGA0560	●
5.7	+0.004/+0.016	6	35,5	44	82	375GA0570	●	375HGA0570	●
5.8	+0.004/+0.016	6	35,3	44	82	375GA0580	●	375HGA0580	●
5.9	+0.004/+0.016	6	35,2	44	82	375GA0590	●	375HGA0590	●
6.0	+0.004/+0.016	6	35,0	44	82	375GA0600	●	375HGA0600	●
6.1	+0.006/+0.021	8	43,9	53	91	375GA0610	●	375HGA0610	●
6.2	+0.006/+0.021	8	43,7	53	91	375GA0620	●	375HGA0620	●
6.3	+0.006/+0.021	8	43,6	53	91	375GA0630	●	375HGA0630	●
6.4	+0.006/+0.021	8	43,4	53	91	375GA0640	●	375HGA0640	●
6.5	+0.006/+0.021	8	43,3	53	91	375GA0650	●	375HGA0650	●
6.6	+0.006/+0.021	8	43,1	53	91	375GA0660	●	375HGA0660	●

● stock standard ○ non-standard stock

375GA-HGA

General application, Weldon shank

5XD

DIN
6537L

GA

HGA

MG
PV400

140°

30°

375GA 375HGA



375GA



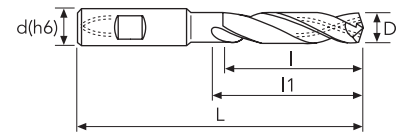
375HGA

P	M	K	N	S	H
★	☆	★			
★	★	★			

375GA

375HGA

★ 1st choice ☆ suitable

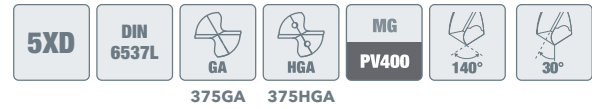


D(m7)	D Tol.	d(h6)	l	l1	L	375GA EDP No.	Stock	375HGA EDP No.	Stock
6.7	+0.006/+0.021	8	43,0	53	91	375GA0670	●	375HGA0670	●
6.8	+0.006/+0.021	8	42,8	53	91	375GA0680	●	375HGA0680	●
6.9	+0.006/+0.021	8	42,7	53	91	375GA0690	●	375HGA0690	●
7.0	+0.006/+0.021	8	42,5	53	91	375GA0700	●	375HGA0700	●
7.1	+0.006/+0.021	8	42,4	53	91	375GA0710	●	375HGA0710	●
7.2	+0.006/+0.021	8	42,2	53	91	375GA0720	●	375HGA0720	●
7.3	+0.006/+0.021	8	42,1	53	91	375GA0730	●	375HGA0730	●
7.4	+0.006/+0.021	8	41,9	53	91	375GA0740	●	375HGA0740	●
7.45	+0.006/+0.021	8	41,8	53	91			375HGA0745	●
7.5	+0.006/+0.021	8	41,8	53	91	375GA0750	●	375HGA0750	●
7.6	+0.006/+0.021	8	41,6	53	91	375GA0760	●	375HGA0760	●
7.7	+0.006/+0.021	8	41,5	53	91	375GA0770	●	375HGA0770	●
7.8	+0.006/+0.021	8	41,3	53	91	375GA0780	●	375HGA0780	●
7.9	+0.006/+0.021	8	41,2	53	91	375GA0790	●	375HGA0790	●
8.0	+0.006/+0.021	8	41,0	53	91	375GA0800	●	375HGA0800	●
8.1	+0.006/+0.021	10	48,9	61	103	375GA0810	●	375HGA0810	●
8.2	+0.006/+0.021	10	48,7	61	103	375GA0820	●	375HGA0820	●
8.3	+0.006/+0.021	10	48,6	61	103	375GA0830	●	375HGA0830	●
8.4	+0.006/+0.021	10	48,4	61	103	375GA0840	●	375HGA0840	●
8.5	+0.006/+0.021	10	48,3	61	103	375GA0850	●	375HGA0850	●
8.6	+0.006/+0.021	10	48,1	61	103	375GA0860	●	375HGA0860	●
8.7	+0.006/+0.021	10	48,0	61	103	375GA0870	●	375HGA0870	●
8.8	+0.006/+0.021	10	47,8	61	103	375GA0880	●	375HGA0880	●
8.9	+0.006/+0.021	10	47,7	61	103	375GA0890	●	375HGA0890	●
9.0	+0.006/+0.021	10	47,5	61	103	375GA0900	●	375HGA0900	●
9.1	+0.006/+0.021	10	47,4	61	103	375GA0910	●	375HGA0910	●
9.2	+0.006/+0.021	10	47,2	61	103	375GA0920	●	375HGA0920	●
9.3	+0.006/+0.021	10	47,1	61	103	375GA0930	●	375HGA0930	●
9.35	+0.006/+0.021	10	47,0	61	103			375HGA0935	●
9.4	+0.006/+0.021	10	46,9	61	103	375GA0940	●	375HGA0940	●
9.5	+0.006/+0.021	10	46,8	61	103	375GA0950	●	375HGA0950	●
9.6	+0.006/+0.021	10	46,6	61	103	375GA0960	●	375HGA0960	●
9.7	+0.006/+0.021	10	46,5	61	103	375GA0970	●	375HGA0970	●
9.8	+0.006/+0.021	10	46,3	61	103	375GA0980	●	375HGA0980	●
9.9	+0.006/+0.021	10	46,2	61	103	375GA0990	●	375HGA0990	●
10.0	+0.006/+0.021	10	46,0	61	103	375GA1000	●	375HGA1000	●
10.1	+0.007/+0.025	12	55,9	71	118	375GA1010	●	375HGA1010	●
10.2	+0.007/+0.025	12	55,7	71	118	375GA1020	●	375HGA1020	●
10.3	+0.007/+0.025	12	55,6	71	118	375GA1030	●	375HGA1030	●

● stock standard ○ non-standard stock

375GA-HGA

General application, Weldon shank



375GA



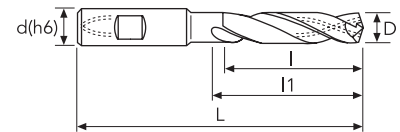
375HGA

P	M	K	N	S	H
★	☆	★			
★	★	★			

375GA

375HGA

★ 1st choice ☆ suitable



D(m7)	D Tol.	d(h6)	l	l1	L	375GA EDP No.	Stock	375HGA EDP No.	Stock
10.4	+0.007/+0.025	12	55,4	71	118	375GA1040	●	375HGA1040	●
10.5	+0.007/+0.025	12	55,3	71	118	375GA1050	●	375HGA1050	●
10.6	+0.007/+0.025	12	55,1	71	118	375GA1060	●	375HGA1060	●
10.7	+0.007/+0.025	12	55,0	71	118	375GA1070	●	375HGA1070	●
10.8	+0.007/+0.025	12	54,8	71	118	375GA1080	●	375HGA1080	●
10.9	+0.007/+0.025	12	54,7	71	118	375GA1090	●	375HGA1090	●
11.0	+0.007/+0.025	12	54,5	71	118	375GA1100	●	375HGA1100	●
11.1	+0.007/+0.025	12	54,4	71	118	375GA1110	●	375HGA1110	●
11.2	+0.007/+0.025	12	54,2	71	118	375GA1120	●	375HGA1120	●
11.3	+0.007/+0.025	12	54,1	71	118	375GA1130	●	375HGA1130	●
11.4	+0.007/+0.025	12	53,9	71	118	375GA1140	●	375HGA1140	●
11.5	+0.007/+0.025	12	53,8	71	118	375GA1150	●	375HGA1150	●
11.6	+0.007/+0.025	12	53,6	71	118	375GA1160	●	375HGA1160	●
11.7	+0.007/+0.025	12	53,5	71	118	375GA1170	●	375HGA1170	●
11.8	+0.007/+0.025	12	53,3	71	118	375GA1180	●	375HGA1180	●
11.9	+0.007/+0.025	12	53,2	71	118	375GA1190	●	375HGA1190	●
12.0	+0.007/+0.025	12	53,0	71	118	375GA1200	●	375HGA1200	●
12.1	+0.007/+0.025	14	58,9	77	124			375HGA1210	●
12.2	+0.007/+0.025	14	58,7	77	124			375HGA1220	●
12.3	+0.007/+0.025	14	58,6	77	124			375HGA1230	●
12.4	+0.007/+0.025	14	58,4	77	124			375HGA1240	●
12.5	+0.007/+0.025	14	58,3	77	124	375GA1250	●	375HGA1250	●
12.6	+0.007/+0.025	14	58,1	77	124			375HGA1260	●
12.7	+0.007/+0.025	14	58,0	77	124			375HGA1270	●
12.8	+0.007/+0.025	14	57,8	77	124			375HGA1280	●
13.0	+0.007/+0.025	14	57,5	77	124	375GA1300	●	375HGA1300	●
13.5	+0.007/+0.025	14	56,8	77	124	375GA1350	●	375HGA1350	●
13.7	+0.007/+0.025	14	56,5	77	124			375HGA1370	●
13.8	+0.007/+0.025	14	56,3	77	124			375HGA1380	●
13.9	+0.007/+0.025	14	56,2	77	124			375HGA1390	●
14.0	+0.007/+0.025	14	56,0	77	124	375GA1400	●	375HGA1400	●
14.1	+0.007/+0.025	16	61,9	83	133			375HGA1410	●
14.2	+0.007/+0.025	16	61,7	83	133			375HGA1420	●
14.5	+0.007/+0.025	16	61,3	83	133	375GA1450	●	375HGA1450	●
14.7	+0.007/+0.025	16	61,0	83	133			375HGA1470	●
14.8	+0.007/+0.025	16	60,8	83	133			375HGA1480	●
15.0	+0.007/+0.025	16	60,5	83	133	375GA1500	●	375HGA1500	●
15.1	+0.007/+0.025	16	60,4	83	133			375HGA1510	●
15.2	+0.007/+0.025	16	60,2	83	133			375HGA1520	●

● stock standard ○ non-standard stock

375GA

	Material Group ISO 513	P1	P2	P3 P4	P5 P6	P7	P8
	Hardness/Rm	<500 N/mm ²	500÷700 N/mm ²	600÷1000 N/mm ²	900÷1480 N/mm ²	<750 N/mm ²	850÷1200 N/mm ²
	Vc (m/min)	70÷90	60÷80	60÷80	50÷70	40÷60	35÷55
	D (mm)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)
3	0.143	0.143	0.124	0.105	0.076	0.057	
4	0.143	0.143	0.124	0.105	0.076	0.057	
6	0.181	0.181	0.162	0.133	0.114	0.095	
8	0.209	0.209	0.190	0.152	0.133	0.124	
10	0.209	0.209	0.190	0.152	0.133	0.124	
12	0.266	0.266	0.219	0.181	0.171	0.171	
14	0.304	0.304	0.238	0.209	0.190	0.190	
16	0.304	0.304	0.238	0.209	0.190	0.190	
18	0.361	0.361	0.285	0.228	0.228	0.228	
20	0.361	0.361	0.285	0.228	0.228	0.228	


375HGA

	Material Group ISO 513	P1	P2	P3 P4	P5 P6	P7	P8
	Hardness/Rm	<500 N/mm ²	500÷700 N/mm ²	600÷1000 N/mm ²	900÷1480 N/mm ²	<750 N/mm ²	850÷1200 N/mm ²
	Vc (m/min)	90÷110	70÷90	70÷90	50÷70	50÷70	40÷60
	D (mm)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)
3	0.150	0.150	0.130	0.110	0.080	0.060	
4	0.150	0.150	0.130	0.110	0.080	0.060	
6	0.190	0.190	0.170	0.140	0.120	0.100	
8	0.220	0.220	0.200	0.160	0.140	0.130	
10	0.220	0.220	0.200	0.160	0.140	0.130	
12	0.280	0.280	0.230	0.190	0.180	0.180	
14	0.320	0.320	0.250	0.220	0.200	0.200	
16	0.320	0.320	0.250	0.220	0.200	0.200	
18	0.380	0.380	0.300	0.240	0.240	0.240	
20	0.380	0.380	0.300	0.240	0.240	0.240	


375HGA

	Material Group ISO 513	M1	M2	M3			
	Hardness/Rm	<750 N/mm ²	550÷850 N/mm ²	650÷950 N/mm ²			
	Vc (m/min)	50÷70	50÷70	35÷55			
	D (mm)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)			
3	0.080	0.060	0.060				
4	0.100	0.080	0.080				
6	0.120	0.080	0.080				
8	0.130	0.100	0.100				
10	0.150	0.110	0.110				
12	0.170	0.130	0.130				
14	0.180	0.130	0.130				
16	0.200	0.140	0.140				
18	0.220	0.140	0.140				
20	0.240	0.160	0.160				

375GA

 Ø RUN OUT <0.02mm	Material Group ISO 513	K1	K2	K3				
	Hardness/Rm	150÷250 HB	150÷350 HB	120÷260 HB				
	Vc (m/min)	90÷110	70÷90	60÷80				
	D (mm)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)				
	3	0.162	0.143	0.086				
	4	0.190	0.162	0.095				
	6	0.238	0.190	0.124				
	8	0.257	0.238	0.152				
	10	0.285	0.266	0.190				
	12	0.314	0.285	0.209				
14	0.342	0.314	0.228					
16	0.380	0.333	0.247					
18	0.399	0.361	0.266					
20	0.428	0.380	0.266					

375HGA

 Ø RUN OUT <0.02mm	Material Group ISO 513	K1	K2	K3			
	Hardness/Rm	150÷250 HB	150÷350 HB	120÷260 HB			
	Vc (m/min)	110÷130	90÷110	70÷90			
	D (mm)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)			
	3	0.170	0.150	0.090			
	4	0.200	0.170	0.100			
	6	0.250	0.200	0.130			
	8	0.270	0.250	0.160			
	10	0.300	0.280	0.200			
	12	0.330	0.300	0.220			
14	0.360	0.330	0.240				
16	0.400	0.350	0.260				
18	0.420	0.380	0.280				
20	0.450	0.400	0.280				

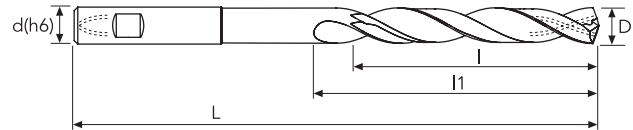
358HGA

General application, Weldon shank



P	M	K	N	S	H
★	★	★	☆	☆	☆

★ 1st choice ☆ suitable



D(m7)	D Tol.	d(h6)	l	l1	L	EDP No.	Stock
3.0	+0.012/+0.002	6	29	34	72	358HGA0300	●
3.1	+0.016/+0.004	6	29	34	72	358HGA0310	●
3.2	+0.016/+0.004	6	29	34	72	358HGA0320	●
3.3	+0.016/+0.004	6	29	34	72	358HGA0330	●
3.4	+0.016/+0.004	6	29	34	72	358HGA0340	●
3.5	+0.016/+0.004	6	29	34	72	358HGA0350	●
3.6	+0.016/+0.004	6	29	34	72	358HGA0360	●
3.7	+0.016/+0.004	6	29	34	72	358HGA0370	●
3.8	+0.016/+0.004	6	36	43	81	358HGA0380	●
3.9	+0.016/+0.004	6	36	43	81	358HGA0390	●
4.0	+0.016/+0.004	6	36	43	81	358HGA0400	●
4.1	+0.016/+0.004	6	36	43	81	358HGA0410	●
4.2	+0.016/+0.004	6	36	43	81	358HGA0420	●
4.3	+0.016/+0.004	6	36	43	81	358HGA0430	●
4.4	+0.016/+0.004	6	36	43	81	358HGA0440	○
4.5	+0.016/+0.004	6	36	43	81	358HGA0450	●
4.6	+0.016/+0.004	6	36	43	81	358HGA0460	●
4.7	+0.016/+0.004	6	36	43	81	358HGA0470	●
4.8	+0.016/+0.004	6	48	57	95	358HGA0480	●
4.9	+0.016/+0.004	6	48	57	95	358HGA0490	●
5.0	+0.016/+0.004	6	48	57	95	358HGA0500	●
5.1	+0.016/+0.004	6	48	57	95	358HGA0510	●
5.2	+0.016/+0.004	6	48	57	95	358HGA0520	●
5.3	+0.016/+0.004	6	48	57	95	358HGA0530	●
5.4	+0.016/+0.004	6	48	57	95	358HGA0540	○
5.5	+0.016/+0.004	6	48	57	95	358HGA0550	●
5.6	+0.016/+0.004	6	48	57	95	358HGA0560	●
5.7	+0.016/+0.004	6	48	57	95	358HGA0570	●
5.8	+0.016/+0.004	6	48	57	95	358HGA0580	●
5.9	+0.016/+0.004	6	48	57	95	358HGA0590	●
6.0	+0.016/+0.004	6	48	57	95	358HGA0600	●
6.1	+0.021/+0.006	8	64	76	114	358HGA0610	●
6.2	+0.021/+0.006	8	64	76	114	358HGA0620	●
6.3	+0.021/+0.006	8	64	76	114	358HGA0630	●
6.4	+0.021/+0.006	8	64	76	114	358HGA0640	●
6.5	+0.021/+0.006	8	64	76	114	358HGA0650	●
6.6	+0.021/+0.006	8	64	76	114	358HGA0660	●
6.7	+0.021/+0.006	8	64	76	114	358HGA0670	●
6.8	+0.021/+0.006	8	64	76	114	358HGA0680	●

● stock standard ○ non-standard stock

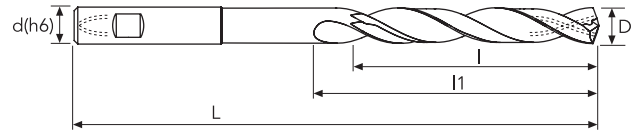
358HGA

General application, Weldon shank



P	M	K	N	S	H
★	★	★	☆		

★ 1st choice ☆ suitable



D(m7)	D Tol.	d(h6)	l	l1	L	EDP No.	Stock
6.9	+0.021/+0.006	8	64	76	114	358HGA0690	●
7.0	+0.021/+0.006	8	64	76	114	358HGA0700	●
7.1	+0.021/+0.006	8	64	76	114	358HGA0710	●
7.2	+0.021/+0.006	8	64	76	114	358HGA0720	●
7.3	+0.021/+0.006	8	64	76	114	358HGA0730	●
7.4	+0.021/+0.006	8	64	76	114	358HGA0740	●
7.5	+0.021/+0.006	8	64	76	114	358HGA0750	●
7.6	+0.021/+0.006	8	64	76	114	358HGA0760	●
7.7	+0.021/+0.006	8	64	76	114	358HGA0770	○
7.8	+0.021/+0.006	8	64	76	114	358HGA0780	●
7.9	+0.021/+0.006	8	64	76	114	358HGA0790	○
8.0	+0.021/+0.006	8	64	76	114	358HGA0800	●
8.1	+0.021/+0.006	10	80	95	142	358HGA0810	●
8.2	+0.021/+0.006	10	80	95	142	358HGA0820	●
8.3	+0.021/+0.006	10	80	95	142	358HGA0830	●
8.4	+0.021/+0.006	10	80	95	142	358HGA0840	○
8.5	+0.021/+0.006	10	80	95	142	358HGA0850	●
8.6	+0.021/+0.006	10	80	95	142	358HGA0860	●
8.7	+0.021/+0.006	10	80	95	142	358HGA0870	●
8.8	+0.021/+0.006	10	80	95	142	358HGA0880	●
8.9	+0.021/+0.006	10	80	95	142	358HGA0890	○
9.0	+0.021/+0.006	10	80	95	142	358HGA0900	●
9.1	+0.021/+0.006	10	80	95	142	358HGA0910	●
9.2	+0.021/+0.006	10	80	95	142	358HGA0920	●
9.3	+0.021/+0.006	10	80	95	142	358HGA0930	●
9.4	+0.021/+0.006	10	80	95	142	358HGA0940	○
9.5	+0.021/+0.006	10	80	95	142	358HGA0950	●
9.6	+0.021/+0.006	10	80	95	142	358HGA0960	○
9.7	+0.021/+0.006	10	80	95	142	358HGA0970	○
9.8	+0.021/+0.006	10	80	95	142	358HGA0980	●
9.9	+0.021/+0.006	10	80	95	142	358HGA0990	○
10.0	+0.021/+0.006	10	80	95	142	358HGA1000	●
10.1	+0.025/+0.007	12	96	114	162	358HGA1010	○
10.2	+0.025/+0.007	12	96	114	162	358HGA1020	●
10.3	+0.025/+0.007	12	96	114	162	358HGA1030	○
10.4	+0.025/+0.007	12	96	114	162	358HGA1040	○
10.5	+0.025/+0.007	12	96	114	162	358HGA1050	●
10.6	+0.025/+0.007	12	96	114	162	358HGA1060	○
10.7	+0.025/+0.007	12	96	114	162	358HGA1070	○

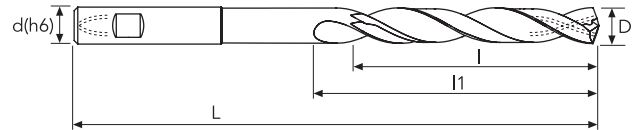
358HGA

General application, Weldon shank



P	M	K	N	S	H
★	★	★	☆		

★ 1st choice ☆ suitable



D(m7)	D Tol.	d(h6)	l	l1	L	EDP No.	Stock
10.8	+0.025/+0.007	12	96	114	162	358HGA1080	●
10.9	+0.025/+0.007	12	96	114	162	358HGA1090	○
11.0	+0.025/+0.007	12	96	114	162	358HGA1100	●
11.1	+0.025/+0.007	12	96	114	162	358HGA1110	○
11.2	+0.025/+0.007	12	96	114	162	358HGA1120	●
11.3	+0.025/+0.007	12	96	114	162	358HGA1130	○
11.4	+0.025/+0.007	12	96	114	162	358HGA1140	○
11.5	+0.025/+0.007	12	96	114	162	358HGA1150	●
11.6	+0.025/+0.007	12	96	114	162	358HGA1160	○
11.7	+0.025/+0.007	12	96	114	162	358HGA1170	○
11.8	+0.025/+0.007	12	96	114	162	358HGA1180	●
11.9	+0.025/+0.007	12	96	114	162	358HGA1190	○
12.0	+0.025/+0.007	12	96	114	162	358HGA1200	●
12.2	+0.025/+0.007	14	112	133	182	358HGA1220	●
12.5	+0.025/+0.007	14	112	133	182	358HGA1250	●
12.8	+0.025/+0.007	14	112	133	182	358HGA1280	●
13.0	+0.025/+0.007	14	112	133	182	358HGA1300	●
13.2	+0.025/+0.007	14	112	133	182	358HGA1320	●
13.5	+0.025/+0.007	14	112	133	182	358HGA1350	●
13.8	+0.025/+0.007	14	112	133	182	358HGA1380	○
14.0	+0.025/+0.007	14	112	133	182	358HGA1400	●
14.2	+0.025/+0.007	16	128	152	203	358HGA1420	●
14.5	+0.025/+0.007	16	128	152	203	358HGA1450	●
14.8	+0.025/+0.007	16	128	152	203	358HGA1480	○
15.0	+0.025/+0.007	16	128	152	203	358HGA1500	●
15.5	+0.025/+0.007	16	128	152	203	358HGA1550	●
15.8	+0.025/+0.007	16	128	152	203	358HGA1580	○
16.0	+0.025/+0.007	16	128	152	203	358HGA1600	●
16.5	+0.025/+0.007	18	144	171	222	358HGA1650	●
16.8	+0.025/+0.007	18	144	171	222	358HGA1680	○
17.0	+0.025/+0.007	18	144	171	222	358HGA1700	●
17.5	+0.025/+0.007	18	144	171	222	358HGA1750	●
17.8	+0.025/+0.007	18	144	171	222	358HGA1780	○
18.0	+0.025/+0.007	18	144	171	222	358HGA1800	●
18.5	+0.029/+0.008	20	160	190	243	358HGA1850	●
18.8	+0.029/+0.008	20	160	190	243	358HGA1880	○
19.0	+0.029/+0.008	20	160	190	243	358HGA1900	●
19.5	+0.029/+0.008	20	160	190	243	358HGA1950	●
19.8	+0.029/+0.008	20	160	190	243	358HGA1980	○
20.0	+0.029/+0.008	20	160	190	243	358HGA2000	●

● stock standard ○ non-standard stock

358HGA

	Material Group ISO 513	P1	P2	P3 P4	P5 P6	P7	P8
	Hardness/Rm	<500 N/mm ²	500÷700 N/mm ²	600÷1000 N/mm ²	900÷1480 N/mm ²	<700 N/mm ²	850÷1200 N/mm ²
	Vc (m/min)	80÷100	65÷85	65÷85	45÷65	45÷65	35÷55
	D (mm)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)
3	0.150	0.150	0.130	0.105	0.057	0.057	
4	0.150	0.150	0.130	0.105	0.057	0.057	
6	0.190	0.190	0.170	0.133	0.095	0.095	
8	0.220	0.220	0.200	0.152	0.124	0.124	
10	0.220	0.220	0.200	0.152	0.124	0.124	
12	0.280	0.280	0.230	0.181	0.171	0.171	
14	0.320	0.320	0.250	0.209	0.190	0.190	
16	0.320	0.320	0.250	0.209	0.190	0.190	
18	0.380	0.380	0.300	0.228	0.228	0.228	
20	0.380	0.380	0.300	0.228	0.228	0.228	

358HGA

	Material Group ISO 513	M1	M2	M3		
	Hardness/Rm	<750 N/mm ²	550÷850 N/mm ²	650÷950 N/mm ²		
	Vc (m/min)	40÷60	40÷60	30÷50		
	D (mm)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)		
3	0.800	0.060	0.060			
4	0.800	0.060	0.060			
6	0.100	0.080	0.080			
8	0.100	0.080	0.080			
10	0.120	0.100	0.100			
12	0.120	0.100	0.100			
14	0.140	0.120	0.120			
16	0.140	0.120	0.120			
18	0.160	0.140	0.140			
20	0.160	0.140	0.140			

358HGA

	Material Group ISO 513	K1	K2	K3		
	Hardness/Rm	150÷250 HB	150÷350 HB	250÷500 HB		
	Vc (m/min)	100÷120	80÷100	65÷85		
	D (mm)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)		
3	0.162	0.143	0.086			
4	0.190	0.162	0.095			
6	0.238	0.190	0.124			
8	0.257	0.238	0.152			
10	0.285	0.266	0.190			
12	0.314	0.285	0.209			
14	0.342	0.314	0.228			
16	0.380	0.333	0.247			
18	0.399	0.361	0.266			
20	0.428	0.380	0.266			



TYPHOON HVA

HIGH PERFORMANCE - STAINLESS STEEL

✚ High performance tools for stainless steel (ISO M), steel (ISO P), and HRSA super alloys (ISO S) below 45 HRC.

🇮🇹 Punta ad alto rendimento per la foratura di acciaio inossidabile (ISO M), acciaio (ISO P) e super leghe (ISO S) sino a 45 HRC.

🇩🇪 Hochleistungsbohrer für das Bohren von rostfreiem Stahl (ISO M), Stahl (ISO P) und Superlegierungen (ISO S) bis 45 HRC

🇫🇷 Forets haute performance pour le perçage de l'acier inoxydable (ISO M), de l'acier (ISO P) et des super alliages (ISO S) jusqu'à 45 HRC.

🇪🇸 Brocas de alto rendimiento para el taladrado de acero inoxidable (ISO M), acero (ISO P) e y súper aleaciones (ISO S) hasta 45 HRC.

🇷🇺 Высокопроизводительный инструмент для обработки нержавеющей стали (ISO M), стали (ISO P) и жаропрочных сплавов (ISO S) с твёрдостью до 45 HRC.



- Self-centering geometry: large chisel edge for highly accurate holes
- Straight cutting edge: short chips for easy evacuation and high reliability
- Large back taper geometry: reduces the torque and improves the cutting efficiency
- Chip pocket design: smooth surface to reduce welding and wide space to improve chip ejection
- Substrate: specifically selected nano grain for high wear resistance, long and reliable life
- Coating: improved new coating technology for high wear resistance



- Affûtage autocentré large arête transversale pour des trous très précis
- Profil de l'arête droit et renforcé : il génère des copeaux courts et garantit une grande fiabilité
- Géométrie du corps avec conicité arrière pour faciliter l'action de coupe
- Géométrie des goujures: surface lisse pour réduire les problèmes de collage et faciliter l'évacuation des copeaux
- Substrat: des nanograins spécifiquement sélectionnés pour une haute résistance à l'usure, une durée de vie longue et fiable
- Revêtement: nouvelle technologie de revêtement améliorée pour une haute résistance à l'usure



- Affilatura autocentrante: il particolare design del tagliente trasversale permette forature molto precise
- Profilo del tagliente diritto e rinforzato: genera trucioli corti e garantisce grande affidabilità
- Geometria del corpo con ampia conicità posteriore per agevolare l'azione di taglio
- Geometria delle gole: elevata finitura per ridurre il fenomeno dell'incollaggio e facilitare l'espulsione dei trucioli
- Substrato: nano grani selezionati per elevata resistenza all'usura, lunga durata e affidabilità
- Rivestimento: nuova tecnologia per elevata resistenza all'usura



- Afilado autocentrante amplio filo transversal para agujeros muy precisos
- Perfil del filo recto y reforzado: genera virutas cortas y garantiza una gran fiabilidad
- Geometría del cuerpo con conicidad posterior para facilitar la acción de corte
- Geometría de las ranuras: Acabado superficial excelente para reducir el problema del encolado y facilitar la evacuación de las virutas
- Sustrato: nanograno específicamente seleccionado para una alta resistencia al desgaste y una vida útil larga y fiable
- Recubrimiento: nueva tecnología de alta resistencia al desgaste



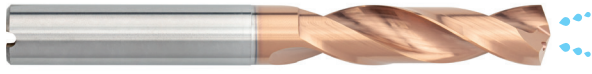
- Selbstzentrierender Schliff: das besondere Design der Querschneide ermöglicht ein sehr präzises Bohren
- Gerades und verstärktes Schneidkantenprofil: zur Erzeugung kurzer Späne und Gewährleistung hoher Zuverlässigkeit
- Geometrie der Schneidkante mit speziellem Schliff zum Schutz von Schneidkante und Kanten
- Nutengeometrie: Glattere Oberflächen zur Vermeidung des Klebphänomens und zur Verbesserung der Spanabfuhr
- Substrat: Spezielle Nanokörnung für eine hohe Verschleissbeständigkeit und Standzeit.
- Beschichtung: Verbesserte Beschichtung für eine höhere Verschleissbeständigkeit.



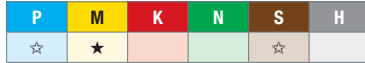
- Самоцентрирующаяся геометрия: особая конструкция режущей кромки обеспечивает очень точное сверление
- Прямые режущие кромки: формирование короткой стружки и высокая надежность
- Геометрия с обратным конусом: увеличивает эффективность обработки
- Геометрия канавки: гладкая поверхность для уменьшения наклепа и большое пространство для улучшения отвода стружки
- Субстрат: специальный нанозернистый твердый сплав для высокой износостойкости, долгого и надежного срока службы
- Покрытие: улучшенная новая технология покрытия для обеспечения высокой износостойкости

353HVA

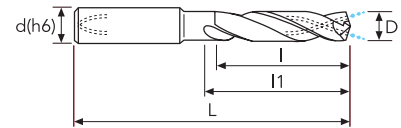
Stainless steel



353HVA replaces 353SUH.
353HVA will be gradually available as soon as 353SUH stock is phased out



★ 1st choice ☆ suitable

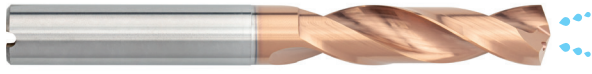


D(m7)	D Tol.	d(h6)	l	l1	L	EDP No.	Stock
3.00	+0.012/+0.002	6	14	20	62	353HVA0300	●
3.10	+0.016/+0.004	6	14	20	62	353HVA0310	●
3.20	+0.016/+0.004	6	14	20	62	353HVA0320	●
3.30	+0.016/+0.004	6	14	20	62	353HVA0330	●
3.40	+0.016/+0.004	6	14	20	62	353HVA0340	●
3.50	+0.016/+0.004	6	14	20	62	353HVA0350	●
3.60	+0.016/+0.004	6	14	20	62	353HVA0360	●
3.70	+0.016/+0.004	6	14	20	62	353HVA0370	●
3.80	+0.016/+0.004	6	17	24	66	353HVA0380	●
3.90	+0.016/+0.004	6	17	24	66	353HVA0390	●
4.00	+0.016/+0.004	6	17	24	66	353HVA0400	●
4.10	+0.016/+0.004	6	17	24	66	353HVA0410	●
4.20	+0.016/+0.004	6	17	24	66	353HVA0420	●
4.30	+0.016/+0.004	6	17	24	66	353HVA0430	●
4.40	+0.016/+0.004	6	17	24	66	353HVA0440	●
4.50	+0.016/+0.004	6	17	24	66	353HVA0450	●
4.60	+0.016/+0.004	6	17	24	66	353HVA0460	●
4.70	+0.016/+0.004	6	17	24	66	353HVA0470	●
4.80	+0.016/+0.004	6	20	28	66	353HVA0480	●
4.90	+0.016/+0.004	6	20	28	66	353HVA0490	●
5.00	+0.016/+0.004	6	20	28	66	353HVA0500	●
5.10	+0.016/+0.004	6	20	28	66	353HVA0510	●
5.20	+0.016/+0.004	6	20	28	66	353HVA0520	●
5.30	+0.016/+0.004	6	20	28	66	353HVA0530	●
5.40	+0.016/+0.004	6	20	28	66	353HVA0540	●
5.50	+0.016/+0.004	6	20	28	66	353HVA0550	●
5.60	+0.016/+0.004	6	20	28	66	353HVA0560	●
5.70	+0.016/+0.004	6	20	28	66	353HVA0570	●
5.80	+0.016/+0.004	6	20	28	66	353HVA0580	●
5.90	+0.016/+0.004	6	20	28	66	353HVA0590	●
6.00	+0.016/+0.004	6	20	28	66	353HVA0600	●
6.10	+0.021/+0.006	8	24	34	79	353HVA0610	●
6.20	+0.021/+0.006	8	24	34	79	353HVA0620	●
6.30	+0.021/+0.006	8	24	34	79	353HVA0630	●
6.40	+0.021/+0.006	8	24	34	79	353HVA0640	●
6.50	+0.021/+0.006	8	24	34	79	353HVA0650	●
6.60	+0.021/+0.006	8	24	34	79	353HVA0660	●
6.70	+0.021/+0.006	8	24	34	79	353HVA0670	●
6.80	+0.021/+0.006	8	24	34	79	353HVA0680	●

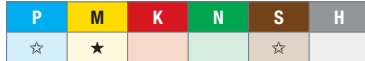
● stock standard ○ non-standard stock ▽ stock exhaustion

353HVA

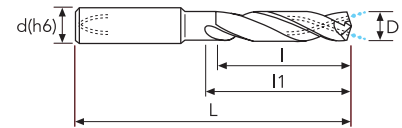
Stainless steel



353HVA replaces 353SUH.
353HVA will be gradually available as soon as 353SUH stock is phased out



★ 1st choice ☆ suitable



D(m7)	D Tol.	d(h6)	l	l1	L	EDP No.	Stock
6.90	+0.021/+0.006	8	24	34	79	353HVA0690	●
7.00	+0.021/+0.006	8	24	34	79	353HVA0700	●
7.10	+0.021/+0.006	8	29	41	79	353HVA0710	●
7.20	+0.021/+0.006	8	29	41	79	353HVA0720	●
7.30	+0.021/+0.006	8	29	41	79	353HVA0730	●
7.40	+0.021/+0.006	8	29	41	79	353HVA0740	●
7.50	+0.021/+0.006	8	29	41	79	353HVA0750	●
7.60	+0.021/+0.006	8	29	41	79	353HVA0760	●
7.70	+0.021/+0.006	8	29	41	79	353HVA0770	●
7.80	+0.021/+0.006	8	29	41	79	353HVA0780	●
7.90	+0.021/+0.006	8	29	41	79	353HVA0790	●
8.00	+0.021/+0.006	8	29	41	79	353HVA0800	●
8.10	+0.021/+0.006	10	35	47	89	353HVA0810	●
8.20	+0.021/+0.006	10	35	47	89	353HVA0820	●
8.30	+0.021/+0.006	10	35	47	89	353HVA0830	●
8.40	+0.021/+0.006	10	35	47	89	353HVA0840	●
8.50	+0.021/+0.006	10	35	47	89	353HVA0850	●
8.60	+0.021/+0.006	10	35	47	89	353HVA0860	●
8.70	+0.021/+0.006	10	35	47	89	353HVA0870	●
8.80	+0.021/+0.006	10	35	47	89	353HVA0880	●
8.90	+0.021/+0.006	10	35	47	89	353HVA0890	●
9.00	+0.021/+0.006	10	35	47	89	353HVA0900	●
9.10	+0.021/+0.006	10	35	47	89	353HVA0910	●
9.20	+0.021/+0.006	10	35	47	89	353HVA0920	●
9.30	+0.021/+0.006	10	35	47	89	353HVA0930	●
9.40	+0.021/+0.006	10	35	47	89	353HVA0940	●
9.50	+0.021/+0.006	10	35	47	89	353HVA0950	●
9.60	+0.021/+0.006	10	35	47	89	353HVA0960	●
9.70	+0.021/+0.006	10	35	47	89	353HVA0970	●
9.80	+0.021/+0.006	10	35	47	89	353HVA0980	●
9.90	+0.021/+0.006	10	35	47	89	353HVA0990	●
10.00	+0.021/+0.006	10	35	47	89	353HVA1000	●
10.10	+0.025/+0.007	12	40	55	102	353HVA1010	●
10.20	+0.025/+0.007	12	40	55	102	353HVA1020	●
10.30	+0.025/+0.007	12	40	55	102	353HVA1030	●
10.50	+0.025/+0.007	12	40	55	102	353HVA1050	●
10.60	+0.025/+0.007	12	40	55	102	353HVA1060	●
10.80	+0.025/+0.007	12	40	55	102	353HVA1080	●
11.00	+0.025/+0.007	12	40	55	102	353HVA1100	●


● stock standard ○ non-standard stock ▽ stock exhaustion

353HVA

	Material Group ISO 513	P1 P2	P3 P4	P5	P6	P7	P8
	Hardness/Rm	500÷700 N/mm ²	600÷1000 N/mm ²	900÷1200 N/mm ²	1200÷1400 N/mm ²	<700 N/mm ²	850÷1200 N/mm ²
	Vc (m/min)	100÷140	80÷120	70÷90	50÷70	50÷70	20÷30
	D (mm)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)
3	0.118	0.106	0.095	0.083	0.077	0.046	
4	0.140	0.126	0.112	0.098	0.091	0.055	
5	0.161	0.145	0.129	0.113	0.105	0.063	
6	0.183	0.164	0.146	0.128	0.119	0.071	
7	0.204	0.184	0.163	0.143	0.133	0.080	
8	0.226	0.203	0.181	0.158	0.147	0.088	
9	0.247	0.223	0.198	0.173	0.161	0.096	
10	0.269	0.242	0.215	0.188	0.175	0.105	
11	0.280	0.252	0.224	0.196	0.182	0.109	
12	0.301	0.271	0.241	0.211	0.196	0.117	
13	0.323	0.290	0.258	0.226	0.210	0.126	
14	0.344	0.310	0.275	0.241	0.224	0.134	
15	0.366	0.329	0.292	0.256	0.238	0.143	
16	0.387	0.348	0.310	0.271	0.252	0.151	
17	0.398	0.358	0.318	0.278	0.259	0.155	
18	0.409	0.368	0.327	0.286	0.266	0.159	
19	0.419	0.377	0.335	0.293	0.273	0.164	
20	0.430	0.387	0.344	0.301	0.280	0.168	

	Material Group ISO 513	M1	M2	M3		
	Hardness/Rm	<750 N/mm ²	550÷850 N/mm ²	650÷950 N/mm ²		
	Vc (m/min)	50÷70	45÷65	35÷50		
	D (mm)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)		
3	0.077	0.061	0.054			
4	0.091	0.073	0.064			
5	0.105	0.084	0.073			
6	0.119	0.095	0.083			
7	0.133	0.106	0.093			
8	0.147	0.117	0.103			
9	0.161	0.129	0.112			
10	0.175	0.140	0.122			
11	0.182	0.145	0.127			
12	0.196	0.157	0.137			
13	0.210	0.168	0.147			
14	0.224	0.179	0.157			
15	0.238	0.190	0.166			
16	0.252	0.201	0.176			
17	0.259	0.207	0.181			
18	0.266	0.212	0.186			
19	0.273	0.218	0.191			
20	0.280	0.224	0.196			

353HVA

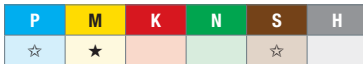
 Ø RUN OUT <0.02mm	Material Group ISO 513	S1 S2	S3	S4	S5		
	Hardness/Rm	<35 N/mm ²	35÷45 N/mm ²				
	Vc (m/min)	30÷50	25÷45	30÷45	25÷35		
	D (mm)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)		
	3	0.053	0.037	0.051	0.043		
4	0.063	0.044	0.060	0.050			
5	0.073	0.051	0.069	0.058			
6	0.082	0.058	0.078	0.066			
7	0.092	0.064	0.087	0.074			
8	0.102	0.071	0.097	0.081			
9	0.111	0.078	0.106	0.089			
10	0.121	0.085	0.115	0.097			
11	0.126	0.088	0.119	0.101			
12	0.135	0.095	0.129	0.108			
13	0.145	0.102	0.138	0.116			
14	0.155	0.108	0.147	0.124			
15	0.164	0.115	0.156	0.132			
16	0.174	0.122	0.165	0.139			
17	0.179	0.125	0.170	0.143			
18	0.184	0.129	0.175	0.147			
19	0.189	0.132	0.179	0.151			
20	0.194	0.135	0.185	0.155			

355HVA

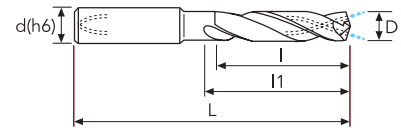
Stainless steel



355HVA replaces 355SUH.
355HVA will be gradually available as soon as 355SUH stock is phased out



★ 1st choice ☆ suitable



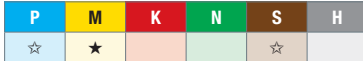
D(m7)	D Tol.	d(h6)	l	l1	L	EDP No.	Stock
3.00	+0.012/+0.002	6	23	28	66	355HVA0300	●
3.10	+0.016/+0.004	6	23	28	66	355HVA0310	●
3.20	+0.016/+0.004	6	23	28	66	355HVA0320	●
3.30	+0.016/+0.004	6	23	28	66	355HVA0330	●
3.40	+0.016/+0.004	6	23	28	66	355HVA0340	●
3.50	+0.016/+0.004	6	23	28	66	355HVA0350	●
3.60	+0.016/+0.004	6	23	28	66	355HVA0360	●
3.70	+0.016/+0.004	6	23	28	66	355HVA0370	●
3.80	+0.016/+0.004	6	29	36	74	355HVA0380	●
3.90	+0.016/+0.004	6	29	36	74	355HVA0390	●
4.00	+0.016/+0.004	6	29	36	74	355HVA0400	●
4.10	+0.016/+0.004	6	29	36	74	355HVA0410	●
4.20	+0.016/+0.004	6	29	36	74	355HVA0420	●
4.30	+0.016/+0.004	6	29	36	74	355HVA0430	●
4.40	+0.016/+0.004	6	29	36	74	355HVA0440	●
4.50	+0.016/+0.004	6	29	36	74	355HVA0450	●
4.60	+0.016/+0.004	6	29	36	74	355HVA0460	●
4.70	+0.016/+0.004	6	29	36	74	355HVA0470	●
4.80	+0.016/+0.004	6	35	44	82	355HVA0480	●
4.90	+0.016/+0.004	6	35	44	82	355HVA0490	●
5.00	+0.016/+0.004	6	35	44	82	355HVA0500	●
5.10	+0.016/+0.004	6	35	44	82	355HVA0510	●
5.20	+0.016/+0.004	6	35	44	82	355HVA0520	●
5.30	+0.016/+0.004	6	35	44	82	355HVA0530	●
5.40	+0.016/+0.004	6	35	44	82	355HVA0540	●
5.50	+0.016/+0.004	6	35	44	82	355HVA0550	●
5.60	+0.016/+0.004	6	35	44	82	355HVA0560	●
5.70	+0.016/+0.004	6	35	44	82	355HVA0570	●
5.80	+0.016/+0.004	6	35	44	82	355HVA0580	●
5.90	+0.016/+0.004	6	35	44	82	355HVA0590	●
6.00	+0.016/+0.004	6	35	44	82	355HVA0600	●
6.10	+0.021/+0.006	8	43	53	91	355HVA0610	●
6.20	+0.021/+0.006	8	43	53	91	355HVA0620	●
6.30	+0.021/+0.006	8	43	53	91	355HVA0630	●
6.40	+0.021/+0.006	8	43	53	91	355HVA0640	●
6.50	+0.021/+0.006	8	43	53	91	355HVA0650	●
6.60	+0.021/+0.006	8	43	53	91	355HVA0660	●
6.70	+0.021/+0.006	8	43	53	91	355HVA0670	●
6.80	+0.021/+0.006	8	43	53	91	355HVA0680	●

355HVA

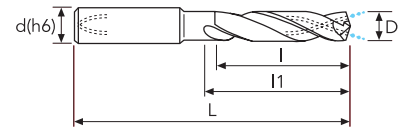
Stainless steel



355HVA replaces 355SUH.
355HVA will be gradually available as soon as 355SUH stock is phased out



★ 1st choice ☆ suitable




D(m7)	D Tol.	d(h6)	l	l1	L	EDP No.	Stock
6.90	+0.021/+0.006	8	43	53	91	355HVA0690	●
7.00	+0.021/+0.006	8	43	53	91	355HVA0700	●
7.10	+0.021/+0.006	8	43	53	91	355HVA0710	●
7.20	+0.021/+0.006	8	43	53	91	355HVA0720	●
7.30	+0.021/+0.006	8	43	53	91	355HVA0730	●
7.40	+0.021/+0.006	8	43	53	91	355HVA0740	●
7.50	+0.021/+0.006	8	43	53	91	355HVA0750	●
7.60	+0.021/+0.006	8	43	53	91	355HVA0760	●
7.70	+0.021/+0.006	8	43	53	91	355HVA0770	●
7.80	+0.021/+0.006	8	43	53	91	355HVA0780	●
7.90	+0.021/+0.006	8	43	53	91	355HVA0790	●
8.00	+0.021/+0.006	8	43	53	91	355HVA0800	●
8.10	+0.021/+0.006	10	49	61	103	355HVA0810	●
8.20	+0.021/+0.006	10	49	61	103	355HVA0820	●
8.30	+0.021/+0.006	10	49	61	103	355HVA0830	●
8.40	+0.021/+0.006	10	49	61	103	355HVA0840	●
8.50	+0.021/+0.006	10	49	61	103	355HVA0850	●
8.60	+0.021/+0.006	10	49	61	103	355HVA0860	●
8.70	+0.021/+0.006	10	49	61	103	355HVA0870	●
8.80	+0.021/+0.006	10	49	61	103	355HVA0880	●
8.90	+0.021/+0.006	10	49	61	103	355HVA0890	●
9.00	+0.021/+0.006	10	49	61	103	355HVA0900	●
9.10	+0.021/+0.006	10	49	61	103	355HVA0910	●
9.20	+0.021/+0.006	10	49	61	103	355HVA0920	●
9.30	+0.021/+0.006	10	49	61	103	355HVA0930	●
9.40	+0.021/+0.006	10	49	61	103	355HVA0940	●
9.50	+0.021/+0.006	10	49	61	103	355HVA0950	●
9.60	+0.021/+0.006	10	49	61	103	355HVA0960	●
9.70	+0.021/+0.006	10	49	61	103	355HVA0970	●
9.80	+0.021/+0.006	10	49	61	103	355HVA0980	●
9.90	+0.021/+0.006	10	49	61	103	355HVA0990	●
10.00	+0.021/+0.006	10	49	61	103	355HVA1000	●
10.10	+0.025/+0.007	12	52	71	118	355HVA1010	●
10.20	+0.025/+0.007	12	52	71	118	355HVA1020	●
10.30	+0.025/+0.007	12	52	71	118	355HVA1030	●
10.50	+0.025/+0.007	12	52	71	118	355HVA1050	●
10.60	+0.025/+0.007	12	52	71	118	355HVA1060	●
10.80	+0.025/+0.007	12	52	71	118	355HVA1080	●
11.00	+0.025/+0.007	12	52	71	118	355HVA1100	●

355HVA

	Material Group ISO 513	P1 P2	P3 P4	P5	P6	P7	P8
	Hardness/Rm	500÷700 N/mm ²	600÷1000 N/mm ²	900÷1200 N/mm ²	1200÷1400 N/mm ²	<700 N/mm ²	850÷1200 N/mm ²
	Vc (m/min)	100+140	80+120	70+90	50+70	50+70	20+30
	D (mm)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)
3	0.101	0.075	0.060	0.050	0.065	0.039	
4	0.119	0.089	0.071	0.059	0.077	0.046	
5	0.137	0.103	0.082	0.069	0.089	0.053	
6	0.155	0.117	0.093	0.078	0.101	0.061	
7	0.174	0.130	0.104	0.087	0.113	0.068	
8	0.192	0.144	0.115	0.096	0.125	0.075	
9	0.210	0.158	0.126	0.105	0.137	0.082	
10	0.228	0.171	0.137	0.114	0.148	0.089	
11	0.238	0.178	0.143	0.119	0.154	0.093	
12	0.256	0.192	0.154	0.128	0.166	0.100	
13	0.274	0.206	0.164	0.137	0.178	0.107	
14	0.292	0.219	0.175	0.146	0.190	0.114	
15	0.311	0.233	0.186	0.155	0.202	0.121	
16	0.329	0.247	0.197	0.164	0.214	0.128	
17	0.338	0.254	0.203	0.169	0.220	0.132	
18	0.347	0.260	0.208	0.174	0.226	0.135	
19	0.356	0.267	0.214	0.178	0.232	0.139	
20	0.366	0.274	0.219	0.183	0.238	0.143	

	Material Group ISO 513	M1	M2	M3		
	Hardness/Rm	<750 N/mm ²	550÷850 N/mm ²	650÷950 N/mm ²		
	Vc (m/min)	50+70	45+65	35+50		
	D (mm)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)		
3	0.065	0.052	0.046			
4	0.077	0.062	0.054			
5	0.089	0.071	0.062			
6	0.101	0.081	0.071			
7	0.113	0.090	0.079			
8	0.125	0.100	0.087			
9	0.137	0.109	0.096			
10	0.148	0.119	0.104			
11	0.154	0.124	0.108			
12	0.166	0.133	0.116			
13	0.178	0.143	0.125			
14	0.190	0.152	0.133			
15	0.202	0.162	0.141			
16	0.214	0.171	0.150			
17	0.220	0.176	0.154			
18	0.226	0.181	0.158			
19	0.232	0.185	0.162			
20	0.238	0.190	0.166			

355HVA

 Ø RUN OUT <0.02mm	Material Group ISO 513	S1 S2	S3	S4	S5				
	Hardness/Rm	<35 N/mm ²		35÷45 N/mm ²					
	Vc (m/min)	30+50		25+45		30+45		25+35	
	D (mm)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)			
	3	0.045	0.032	0.043	0.036				
4	0.053	0.037	0.051	0.043					
5	0.062	0.043	0.059	0.049					
6	0.070	0.049	0.066	0.056					
7	0.078	0.055	0.074	0.063					
8	0.086	0.060	0.082	0.069					
9	0.095	0.066	0.090	0.076					
10	0.103	0.072	0.098	0.082					
11	0.107	0.075	0.102	0.086					
12	0.115	0.081	0.109	0.092					
13	0.123	0.086	0.117	0.099					
14	0.132	0.092	0.125	0.105					
15	0.140	0.098	0.133	0.112					
16	0.148	0.104	0.141	0.118					
17	0.152	0.106	0.145	0.122					
18	0.156	0.109	0.148	0.125					
19	0.160	0.112	0.152	0.128					
20	0.164	0.115	0.156	0.132					



TYPHOON HSD

STEP DRILL FOR 90° CHAMFERING

- ✚ Chamfer drill for universal application ISO P, M, S.
- 🇮🇹 Punta svasatore per applicazione universale ISO P, M, S.
- 🇩🇪 Fasenbohrer für allgemeine Anwendungen auf ISO P, M, S.
- 🇫🇷 Fraise à chanfreiner pour application universelle ISO P, M, S.
- 🇪🇸 Broca de chafflanar universal ISO P, M, S.
- 🇷🇺 Фасочное сверло для универсального применения ISO P, M, S.



- Combined tool: boring and chamfering at the same time
- Straight edge geometry: stable cutting, produces relative small chips
- Flute design: wide flutes for better chip ejection
- Substrate and coating: specifically selected to perform on wide range of workpiece materials



- Outil combiné: alésage et chanfreinage en même temps
- Géométrie de bord droit: coupe stable, produit des copeaux relativement petits
- Conception de gougures: large gougure pour faciliter l'évacuation des copeaux
- Substrat et revêtement: spécialement sélectionnés pour fonctionner sur une large gamme de matière de pièces



- Utensile combinato: foratura e svasatura in un'unica operazione
- Tagliente diritto: garantisce stabilità e produce trucioli più corti
- Design delle gole: ampie per agevolare l'evacuazione dei trucioli
- Substrato e rivestimento: specifici per performare al meglio su una vasta gamma di materiali



- Herramienta mixta: taladrado y chaflanado al mismo tiempo
- Geometría filo recto: corte estable, produce virutas relativamente pequeñas
- Diseño canales: canales anchos para una mejor expulsión de viruta
- Sustrato y revestimiento: específicamente seleccionados para un óptimo rendimiento en una gran variedad de materiales



- Kombiwerkzeug: Bohren und Fasen in einem Arbeitsgang
- Gerade Schnittgeometrie: stabiles schneiden, erzeugt kleine Späne
- Nutenform: breite Nuten um die Späne besser abzuführen
- Substrat und Beschichtung: so ausgewählt um sehr flexibel auf unterschiedlichen Materialgruppen eingesetzt zu werden



- Комбинированное сверло: сверление и снятие фаски
- Прямая режущая кромка: гарантирует стабильность и получение более короткой стружки
- Конструкция канавки: широкая для облегчения удаления стружки
- Исходный материал и покрытие: специально для работы с широким спектром материалов.

372HSD

Material Group ISO 513	P1 P2	P3 P4	P7			
	Hardness/Rm	500÷700 N/mm ²	600÷1000 N/mm ²	<700 N/mm ²		
Vc (m/min)	80÷120	70÷110	40÷80			
D (mm)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)			
3	0.130	0.130	0.075			
4	0.150	0.150	0.090			
5	0.170	0.170	0.100			
6	0.190	0.190	0.110			
7	0.220	0.220	0.120			
8	0.250	0.250	0.130			
9	0.280	0.280	0.140			
10	0.300	0.300	0.150			
11	0.310	0.310	0.155			
12	0.330	0.330	0.160			
13	0.340	0.340	0.165			
14	0.360	0.360	0.175			
15	0.380	0.380	0.180			
16	0.400	0.400	0.185			
17	0.410	0.410	0.195			
18	0.420	0.420	0.200			
19	0.420	0.420	0.200			
20	0.420	0.420	0.210			



372HSD

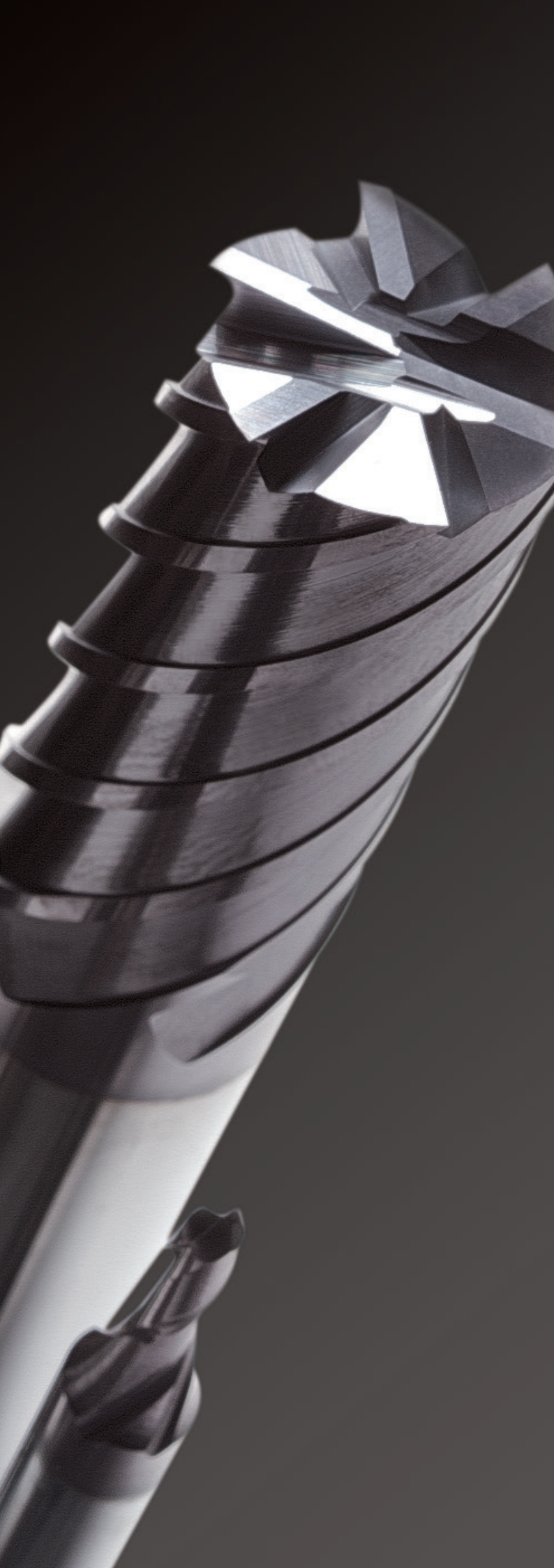
Material Group ISO 513	M1	M2	M3			
	Hardness/Rm	<750 N/mm ²	550÷850 N/mm ²	650÷950 N/mm ²		
Vc (m/min)	40÷80	40÷80	30÷60			
D (mm)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)			
3	0.075	0.055	0.055			
4	0.090	0.070	0.070			
5	0.100	0.075	0.075			
6	0.110	0.075	0.075			
7	0.120	0.080	0.080			
8	0.130	0.090	0.090			
9	0.140	0.095	0.095			
10	0.150	0.105	0.105			
11	0.155	0.115	0.115			
12	0.160	0.120	0.120			
13	0.165	0.125	0.125			
14	0.175	0.135	0.135			
15	0.180	0.135	0.135			
16	0.185	0.140	0.140			
17	0.195	0.145	0.145			
18	0.200	0.150	0.150			
19	0.200	0.160	0.160			
20	0.210	0.170	0.170			



372HSD

	Material Group ISO 513	S1 S2	S3	S5			
	Hardness/Rm	<35 HRC	35÷45 HRC				
	Vc (m/min)	30±50	30±50	25±45			
	D (mm)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)			
	3	0.030÷0.080	0.030÷0.070	0.030÷0.060			
	4	0.040÷0.100	0.040÷0.100	0.040÷0.080			
	5	0.050÷0.100	0.050÷0.100	0.040÷0.090			
	6	0.050÷0.100	0.050÷0.100	0.050÷0.100			
	7	0.050÷0.110	0.050÷0.110	0.050÷0.110			
	8	0.060÷0.120	0.060÷0.120	0.060÷0.110			
	9	0.060÷0.130	0.060÷0.130	0.060÷0.120			
	10	0.070÷0.140	0.070÷0.140	0.070÷0.120			
	11	0.080÷0.150	0.080÷0.150	0.080÷0.130			
	12	0.080÷0.160	0.080÷0.160	0.080÷0.140			
	13	0.080÷0.170	0.080÷0.170	0.080÷0.150			
	14	0.090÷0.180	0.090÷0.180	0.090÷0.160			
	15	0.090÷0.180	0.090÷0.180	0.090÷0.160			
	16	0.100÷0.180	0.100÷0.180	0.100÷0.160			
	17	0.100÷0.190	0.100÷0.190	0.100÷0.170			
	18	0.100÷0.200	0.100÷0.200	0.100÷0.180			
	19	0.110÷0.210	0.110÷0.210	0.110÷0.190			
	20	0.120÷0.220	0.120÷0.220	0.120÷0.200			





G2

GENERAL PURPOSE

✚ Range of general-purpose endmills, featuring new cutting geometries and innovative coatings for enhanced performance. The answer given by Osawa to the market demand for higher performance tools. Thanks to a fully optimized manufacturing process and to large production batches the G2 range excels in the cost-performance ratio.

🇮🇹 Gamma di frese per uso generico, dotate di geometria di taglio e rivestimenti innovativi per garantire prestazioni ancora più elevate. La risposta di Osawa ad un mercato che chiede utensili sempre più performanti e competitivi. L'innovazione nei processi produttivi consente alla gamma G2 di eccellere nel rapporto qualità-prezzo.


🇩🇪 Produktpalette von Fräser für allgemeine Anwendungen, ausgestattet mit einer Schnittgeometrie und innovativen Beschichtungen zur Gewährleistung noch höheren Leistungen. Die Antwort von Osawa auf einen Markt, der immer leistungsstärkere und wettbewerbsfähigere Werkzeuge fordert. Dank der Innovation der Produktionsprozesse zeichnet sich die Produktreihe G2 durch ein außergewöhnliches Preis-Leistungsverhältnis aus.

🇫🇷 Gamme de fraises pour un usage général, dotées de géométrie de coupe et de revêtements innovants pour garantir des prestations encore plus élevées. C'est la réponse d'Osawa à un marché qui nécessite d'outils de plus en plus performants et compétitifs. L'innovation des processus de production permet à la gamme G2 d'avoir un rapport qualité-prix excellent.


🇪🇸 Gama de fresas para uso genérico, provistas de geometría de corte y revestimientos innovadores para garantizar prestaciones aún más elevadas. La respuesta de Osawa a un mercado que pide herramientas cada vez con mayor rendimiento y más competitivas. La innovación en los procesos de producción permite a la gama G2 sobresalir en la relación calidad-precio.

🇷🇺 Ассортимент фрез общего назначения, с новой геометрией и покрытиями, гарантирующими высокоэффективную работу. Это ответ компании Osawa на запросы рынка, который требует всё более конкурентоспособные инструменты с высокими эксплуатационными характеристиками. Инновации в производственных процессах и большие изготавливаемые партии позволяют серии G2 иметь превосходное соотношение цена-качество.

GBL2

 SLOTTING	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4	
	Hardness/Rm	≤700 N/mm ²	600÷1000 N/mm ²	≤35 HRC		
	ap x ae	0.3D x D	0.3D x D	0.3D x D	0.3D x D	
	Vc (m/min)	40+50	25+35	20+30	60+80	
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)	
	3	0.010	0.008	0.007	0.011	
	4	0.013	0.011	0.010	0.014	
	5	0.016	0.014	0.012	0.018	
	6	0.020	0.017	0.015	0.022	
	8	0.026	0.022	0.019	0.033	
10	0.030	0.026	0.023	0.040		
12	0.036	0.031	0.027	0.047		

< D3 mm: ap = 0.2D

 SIDE MILLING	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4	
	Hardness/Rm	≤700 N/mm ²	600÷1000 N/mm ²	≤35 HRC		
	ap x ae	1.5D x 0.3D	1.5D x 0.3D	1.5D x 0.3D	1.5D x 0.3D	
	Vc (m/min)	45+55	30+40	25+35	70+90	
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)	
	3	0.012	0.010	0.009	0.013	
	4	0.015	0.013	0.012	0.017	
	5	0.019	0.016	0.014	0.021	
	6	0.024	0.020	0.018	0.027	
	8	0.031	0.026	0.023	0.040	
10	0.036	0.031	0.027	0.047		
12	0.043	0.037	0.032	0.056		

G2CS2

<p>SLOTTING</p>	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm ²	600÷1000 N/mm ²	≤35 HRC	
	ap x ae	0.5D x D	0.5D x D	0.5D x D	0.5D x D
	Vc (m/min)	80÷100	50÷70	30÷50	100÷120
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.004	0.003	0.003	0.005
	2	0.008	0.007	0.006	0.010
	3	0.012	0.010	0.009	0.016
	4	0.016	0.014	0.012	0.021
	5	0.020	0.017	0.015	0.026
	6	0.025	0.021	0.019	0.033
	8	0.032	0.027	0.024	0.042
	10	0.038	0.032	0.029	0.049
	12	0.045	0.038	0.034	0.059
	14	0.052	0.044	0.039	0.068
16	0.060	0.051	0.045	0.078	
18	0.070	0.060	0.053	0.091	
20	0.080	0.068	0.060	0.104	

< D3 mm: ap = 0.2D

<p>SIDE MILLING</p>	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm ²	600÷1000 N/mm ²	≤35 HRC	
	ap x ae	1.5D x 0.5D	1.5D x 0.5D	1.5D x 0.5D	1.5D x 0.5D
	Vc (m/min)	80÷100	50÷70	30÷50	100÷120
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.005	0.004	0.004	0.006
	2	0.010	0.008	0.007	0.012
	3	0.014	0.012	0.011	0.019
	4	0.019	0.016	0.014	0.025
	5	0.024	0.020	0.018	0.031
	6	0.030	0.026	0.023	0.039
	8	0.038	0.033	0.029	0.050
	10	0.046	0.039	0.034	0.059
	12	0.054	0.046	0.041	0.070
	14	0.062	0.053	0.047	0.081
16	0.072	0.061	0.054	0.094	
18	0.084	0.071	0.063	0.109	
20	0.096	0.082	0.072	0.125	

< D3 mm: ae = 0.2D

<p>DRILLING</p>	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm ²	600÷1000 N/mm ²	≤35 HRC	
	ap x ae	D x D	D x D	D x D	D x D
	Vc (m/min)	70÷90	40÷60	25÷35	80÷100
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.002	0.002	0.002	0.003
	2	0.005	0.004	0.004	0.006
	3	0.007	0.006	0.005	0.009
	4	0.010	0.008	0.007	0.012
	5	0.012	0.010	0.009	0.016
	6	0.015	0.013	0.011	0.020
	8	0.019	0.016	0.014	0.025
	10	0.023	0.019	0.017	0.030
	12	0.027	0.023	0.020	0.035
	14	0.031	0.027	0.023	0.041
16	0.036	0.031	0.027	0.047	
18	0.042	0.036	0.032	0.055	
20	0.048	0.041	0.036	0.062	

< D3 mm: ap = 0.5D

G2210-G2211

	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm ²	600÷1000 N/mm ²	≤35 HRC	
	ap x ae	0.5D x D	0.5D x D	0.5D x D	0.5D x D
	Vc (m/min)	70÷90	45÷65	30÷50	80÷120
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	2	0.007	0.006	0.005	0.009
	3	0.010	0.009	0.008	0.013
	4	0.014	0.012	0.011	0.018
	5	0.018	0.015	0.014	0.023
	6	0.023	0.019	0.017	0.029
8	0.030	0.026	0.023	0.039	
10	0.035	0.030	0.026	0.046	
12	0.041	0.035	0.031	0.053	

< D3 mm: ap = 0.2D

	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm ²	600÷1000 N/mm ²	≤35 HRC	
	ap x ae	1.5D x 0.5D	1.5D x 0.5D	1.5D x 0.5D	1.5D x 0.5D
	Vc (m/min)	70÷90	45÷65	30÷50	80÷120
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	2	0.008	0.007	0.006	0.011
	3	0.012	0.010	0.009	0.016
	4	0.017	0.014	0.013	0.022
	5	0.022	0.018	0.016	0.028
	6	0.027	0.023	0.020	0.035
8	0.036	0.031	0.027	0.047	
10	0.042	0.036	0.032	0.055	
12	0.049	0.042	0.037	0.064	

< D3 mm: ae = 0.2D

	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm ²	600÷1000 N/mm ²	≤35 HRC	
	ap x ae	D x D	D x D	D x D	D x D
	Vc (m/min)	60÷80	40÷60	25÷35	70÷100
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	2	0.004	0.004	0.003	0.005
	3	0.006	0.005	0.005	0.008
	4	0.008	0.007	0.006	0.011
	5	0.011	0.009	0.008	0.014
	6	0.014	0.011	0.010	0.018
8	0.018	0.015	0.014	0.023	
10	0.021	0.018	0.016	0.027	
12	0.025	0.021	0.018	0.032	

< D3 mm: ap = 0.5D

G2212

	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm ²	600÷1000 N/mm ²	≤35 HRC	
	ap x ae	0.3D x D	0.3D x D	0.3D x D	0.3D x D
	Vc (m/min)	55÷75	40÷60	20÷40	70÷90
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	8	0.026	0.022	0.020	0.034
	10	0.032	0.027	0.024	0.042
	12	0.036	0.031	0.027	0.047
	14	0.042	0.036	0.032	0.055
16	0.048	0.041	0.036	0.062	

	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm ²	600÷1000 N/mm ²	≤35 HRC	
	ap x ae	1.5D x 0.3D	1.5D x 0.3D	1.5D x 0.3D	1.5D x 0.3D
	Vc (m/min)	55÷75	40÷60	20÷40	70÷90
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	8	0.031	0.027	0.023	0.041
	10	0.038	0.033	0.029	0.050
	12	0.043	0.037	0.032	0.056
	14	0.050	0.043	0.038	0.066
16	0.058	0.049	0.043	0.075	

	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm ²	600÷1000 N/mm ²	≤35 HRC	
	ap x ae	D x D	D x D	D x D	D x D
	Vc (m/min)	50÷70	35÷55	20÷30	60÷80
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	8	0.016	0.013	0.012	0.020
	10	0.019	0.016	0.014	0.025
	12	0.022	0.018	0.016	0.028
	14	0.025	0.021	0.019	0.033
16	0.029	0.024	0.022	0.037	

G2CSH3


<p>SLOTTING</p>	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm ²	600÷1000 N/mm ²	≤35 HRC	
	ap x ae	0.5D x D	0.5D x D	0.5D x D	0.5D x D
	Vc (m/min)	80÷100	50÷70	30÷50	80÷120
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.003	0.003	0.002	0.004
	2	0.006	0.005	0.005	0.008
	3	0.009	0.008	0.007	0.012
	4	0.013	0.011	0.009	0.016
	5	0.016	0.013	0.012	0.020
	6	0.019	0.016	0.014	0.024
	8	0.025	0.021	0.019	0.033
	10	0.031	0.027	0.023	0.041
	12	0.040	0.034	0.030	0.052
	14	0.046	0.039	0.035	0.060
16	0.056	0.048	0.042	0.073	
18	0.065	0.055	0.049	0.085	
20	0.075	0.064	0.056	0.098	

< D3 mm: ap = 0.2D

<p>SIDE MILLING</p>	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm ²	600÷1000 N/mm ²	≤35 HRC	
	ap x ae	1.5D x 0.3D	1.5D x 0.3D	1.5D x 0.3D	1.5D x 0.3D
	Vc (m/min)	90÷110	60÷80	40÷60	110÷130
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.004	0.003	0.003	0.005
	2	0.008	0.006	0.006	0.010
	3	0.011	0.010	0.008	0.015
	4	0.015	0.013	0.011	0.020
	5	0.019	0.016	0.014	0.024
	6	0.023	0.019	0.017	0.029
	8	0.030	0.026	0.023	0.039
	10	0.038	0.032	0.028	0.049
	12	0.048	0.041	0.036	0.062
	14	0.056	0.047	0.042	0.072
16	0.068	0.057	0.051	0.088	
18	0.078	0.066	0.059	0.101	
20	0.090	0.077	0.068	0.117	

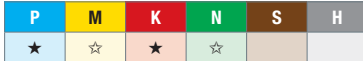
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GBL4

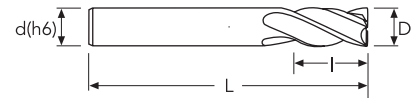
	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm ²	600÷1000 N/mm ²	≤35 HRC	
	ap x ae	1.5D x 0.1D	1.5D x 0.1D	1.5D x 0.1D	1.5D x 0.1D
	Vc (m/min)	45+55	30+40	25+35	70+90
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	3	0.008	0.007	0.006	0.009
	4	0.010	0.009	0.008	0.011
	5	0.013	0.011	0.010	0.014
	6	0.015	0.013	0.011	0.017
	8	0.020	0.017	0.015	0.026
10	0.026	0.022	0.019	0.033	
12	0.032	0.027	0.024	0.042	

G2CS4

cylindrical shank, 4 flutes




★ 1st choice ☆ suitable



D	D Tol.	C	C Tol.	d(h6)	l	l1	L	z	EDP No.	Stock
1	0/-0.020			4	3		50	4	G2CS4010	●
1.5	0/-0.020			4	4.5		50	4	G2CS4015	●
2	0/-0.020			2	8		50	4	G2CS4020S02	●
2	0/-0.020			4	6		50	4	G2CS4020	●
2.5	0/-0.020			4	7		50	4	G2CS4025	●
3	0/-0.020			3	9		50	4	G2CS4030S03	●
3	0/-0.020			4	8		50	4	G2CS4030	●
3.5	0/-0.020			4	10		50	4	G2CS4035	●
4	0/-0.020			4	11		50	4	G2CS4040	●
4.5	0/-0.020			6	13		50	4	G2CS4045	●
5	0/-0.020			6	13		50	4	G2CS4050	●
5.5	0/-0.020			6	13		50	4	G2CS4055	●
6	0/-0.020			6	15		50	4	G2CS4060	●
6.5	0/-0.025			8	17		60	4	G2CS4065	●
7	0/-0.025			8	17		60	4	G2CS4070	●
7.5	0/-0.025			8	17		60	4	G2CS4075	●
8	0/-0.025			8	20		60	4	G2CS4080	●
8.5	0/-0.025			10	23		75	4	G2CS4085	●
9	0/-0.025			10	23		75	4	G2CS4090	●
9.5	0/-0.025			10	25		75	4	G2CS4095	●
10	0/-0.025			10	30		75	4	G2CS4100	●
10.5	0/-0.025			12	25		75	4	G2CS4105	●
11	0/-0.025			12	30		75	4	G2CS4110	●
11.5	0/-0.025			12	28		75	4	G2CS4115	●
12	0/-0.025			12	30		75	4	G2CS4120	●
12.5	0/-0.030			14	26		83	4	G2CS4125	●
13	0/-0.030			14	26		83	4	G2CS4130	●
13.5	0/-0.030			14	26		83	4	G2CS4135	●
14	0/-0.030			14	26		83	4	G2CS4140	●
14.5	0/-0.030			16	32		92	4	G2CS4145	●
15	0/-0.030			16	32		92	4	G2CS4150	●
15.5	0/-0.030			16	32		92	4	G2CS4155	●
16	0/-0.030			16	32		92	4	G2CS4160	●
17	0/-0.030			20	40		100	4	G2CS4170	●
18	0/-0.030			20	40		100	4	G2CS4180	●
19	0/-0.030			20	40		100	4	G2CS4190	●
20	0/-0.030			20	40		100	4	G2CS4200	●
22	0/-0.030			25	40		100	4	G2CS4220	●
25	0/-0.030			25	40		100	4	G2CS4250	●

● stock standard ○ non-standard stock ▽ stock exhaustion

G2CS4

	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm ²	600÷1000 N/mm ²	≤35 HRC	
	ap x ae	1.5D x 0.2D	1.5D x 0.2D	1.5D x 0.2D	1.5D x 0.2D
	Vc (m/min)	80÷100	50÷70	30÷50	100÷120
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	1	0.004	0.003	0.003	0.005
	2	0.007	0.006	0.005	0.009
	3	0.010	0.009	0.008	0.013
	4	0.013	0.011	0.010	0.017
	5	0.016	0.014	0.012	0.021
6	0.019	0.016	0.014	0.025	
8	0.025	0.021	0.019	0.033	
10	0.032	0.027	0.024	0.042	
12	0.040	0.034	0.030	0.052	
14	0.047	0.040	0.035	0.061	
16	0.054	0.046	0.041	0.070	
18	0.060	0.051	0.045	0.078	
20	0.065	0.055	0.049	0.085	
22	0.073	0.062	0.055	0.095	
25	0.083	0.071	0.062	0.108	

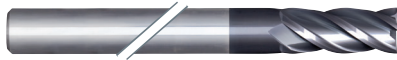
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G2410-11-12-13

cylindrical shank, 4 flutes, long



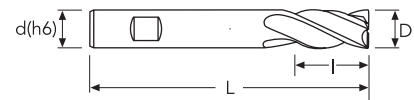
G2410



G2411-G2412-G2413



★ 1st choice ☆ suitable



D	D Tol.	C	C Tol.	d(h6)	l	l1	L	z	EDP No.	Stock
2	0/-0.030			4	9		75	4	G2410020	●
2.5	0/-0.030			4	10		75	4	G2410025	●
3	0/-0.030			4	15		75	4	G2410030	●
3	0/-0.030			3	25		75	4	G2410030CL25	●
3.5	0/-0.030			4	15		75	4	G2410035	●
4	0/-0.030			4	20		75	4	G2410040	●
4	0/-0.030			4	30		75	4	G2410040CL30	●
4.5	0/-0.030			6	20		75	4	G2410045	●
5	0/-0.030			6	25		75	4	G2410050	●
5	0/-0.030			5	30		75	4	G2410050S05	●
6	0/-0.030			6	25		75	4	G2410060	●
6	0/-0.030			6	35		75	4	G2410060CL35	●
8	0/-0.030			8	30		75	4	G2410080	●
3	0/-0.030			6	15		100	4	G2411030	●
4	0/-0.030			6	25		100	4	G2411040	●
5	0/-0.030			6	30		100	4	G2411050	●
6	0/-0.030			6	30		100	4	G2411060	●
7	0/-0.030			8	35		100	4	G2411070	●
8	0/-0.035			8	35		100	4	G2411080	●
9	0/-0.035			10	40		100	4	G2411090	●
10	0/-0.035			10	40		100	4	G2411100	●
11	0/-0.035			12	45		100	4	G2411110	●
12	0/-0.035			12	45		100	4	G2411120	●
14	0/-0.040			14	45		100	4	G2411140	●
16	0/-0.040			16	45		100	4	G2411160	●
6	0/-0.035			6	40		150	4	G2412060CL40	●
6	0/-0.035			6	60		150	4	G2412060CL60	●
8	0/-0.035			8	40		150	4	G2412080	●
8	0/-0.035			8	60		150	4	G2412080CL60	●
10	0/-0.035			10	50		150	4	G2412100	●
10	0/-0.035			10	75		150	4	G2412100CL75	●
12	0/-0.035			12	50		150	4	G2412120	●
12	0/-0.035			12	75		150	4	G2412120CL75	●
16	0/-0.040			16	70		150	4	G2412160	●
18	0/-0.040			20	80		150	4	G2412180	●
20	0/-0.040			20	80		150	4	G2412200	●
16	0/-0.040			16	40		200	4	G2413160	●
20	0/-0.040			20	40		200	4	G2413200	●

● stock standard ○ non-standard stock ▽ stock exhaustion

G2410-G2411

	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm ²	600÷1000 N/mm ²	≤35 HRC	
	ap x ae	1.5D x 0.1D	1.5D x 0.1D	1.5D x 0.1D	1.5D x 0.1D
	Vc (m/min)	70÷90	45÷65	30÷50	80÷120
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	2	0.006	0.005	0.005	0.008
	3	0.009	0.008	0.007	0.012
	4	0.012	0.010	0.009	0.015
	5	0.014	0.012	0.011	0.019
	6	0.017	0.015	0.013	0.022
8	0.023	0.019	0.017	0.029	
10	0.029	0.024	0.022	0.037	
12	0.036	0.031	0.027	0.047	

< D3 mm: ae = 0.1D

G2412-G2413

	Material Group ISO 513	P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
	Hardness/Rm	≤700 N/mm ²	600÷1000 N/mm ²	≤35 HRC	
	ap x ae	1.5D x 0.1D	1.5D x 0.1D	1.5D x 0.1D	1.5D x 0.1D
	Vc (m/min)	55÷75	40÷60	20÷40	70÷90
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	8	0.020	0.017	0.015	0.026
	10	0.026	0.022	0.019	0.033
	12	0.032	0.027	0.024	0.042
	14	0.038	0.032	0.028	0.049
	16	0.043	0.037	0.032	0.056
20	0.065	0.055	0.049	0.085	

INFO

G2CSB2

CARBIDE
DRILLS

PU-HPU
TA-4HTA
SUH
ALH
HRC
SUH MINI
HL
HSD
C-SD-TA



Material Group ISO 513		P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
Hardness/Rm		≤700 N/mm ²	600÷1000 N/mm ²	≤35 HRC	
ap x ae		0.1D x 0.1D	0.1D x 0.1D	0.1D x 0.1D	0.1D x 0.1D
Vc (m/min)		80÷100	60÷80	40÷60	110÷130
D (mm)	D(eff.) (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
1	0.60	0.030	0.023	0.021	0.036
2	1.20	0.040	0.030	0.028	0.048
3	1.80	0.050	0.038	0.035	0.060
4	2.40	0.060	0.045	0.042	0.072
5	3.00	0.070	0.053	0.049	0.084
6	3.60	0.080	0.060	0.056	0.096
8	4.80	0.090	0.068	0.063	0.108
10	6.00	0.105	0.079	0.074	0.126
12	7.20	0.120	0.090	0.084	0.144
16	9.60	0.150	0.113	0.105	0.180
20	12.00	0.180	0.135	0.126	0.216

HSS
DRILLS

LFTA
SUTA
HSS-HSS/CO

CARBIDE
END-MILLS

G2

MDTA
HF VH/UP
MEF
ALU
MEX/MH
UH/MH

HSS
END-MILLS

CARBIDE
BURRS

INFO

G2250

CARBIDE
DRILLS

PU-HPU
TA-4HTA
SUH
ALH
HRC
SUH MINI
HL
HSD
C-SD-TA



Material Group ISO 513		P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
Hardness/Rm		≤700 N/mm ²	600÷1000 N/mm ²	≤35 HRC	
ap x ae		0.1D x 0.1D	0.1D x 0.1D	0.1D x 0.1D	0.1D x 0.1D
Vc (m/min)		70÷90	50÷70	40÷50	100÷120
D (mm)	D(eff.) (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
1	0.60	0.027	0.020	0.019	0.032
2	1.20	0.036	0.027	0.025	0.043
3	1.80	0.045	0.034	0.032	0.054
4	2.40	0.054	0.041	0.038	0.065
5	3.00	0.063	0.047	0.044	0.076
6	3.60	0.072	0.054	0.050	0.086
8	4.80	0.081	0.061	0.057	0.097
10	6.00	0.095	0.071	0.066	0.113
12	7.20	0.108	0.081	0.076	0.130

G2251

HSS
DRILLS

LFTA
SUTA
HSS-HSS/CO



Material Group ISO 513		P1 P2 K1	P3 P4 P7 M1 K2	P5 M2 K3	N1 N2 N3 N4
Hardness/Rm		≤700 N/mm ²	600÷1000 N/mm ²	≤35 HRC	
ap x ae		0.1D x 0.1D	0.1D x 0.1D	0.1D x 0.1D	0.1D x 0.1D
Vc (m/min)		60÷80	40÷60	35÷45	90÷110
D (mm)	D(eff.) (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
6	3.60	0.058	0.044	0.041	0.070
8	4.80	0.066	0.049	0.046	0.079
10	6.00	0.077	0.057	0.054	0.092
12	7.20	0.087	0.066	0.061	0.105
16	9.60	0.122	0.092	0.085	0.146
20	12.00	0.146	0.110	0.102	0.175

CARBIDE
END-MILLS

G2

MDTA
HF VH/UP
MEF
ALU
MEX/MH
UH/MH

HSS
END-MILLS

CARBIDE
BURRS



HF535T

TROCHOIDAL MILLING

🇺🇸 5F trochoidal carbide endmill with chipbreaker for high productivity machining on material groups ISO P, M, K, S.

🇮🇹 Fresa a 5 taglienti in metallo duro per fresatura trocoidale, con rompitruciolo per elevata produttività su materiali dei gruppi ISO P, M, K, S.

🇩🇪 VHM Fräser Z5 mit Spanbrecher, für Trochoidalfräsen. Hochproduktive Bearbeitung der Werkstoffgruppen ISO P, M, K, S.

🇫🇷 Fraise à 5 goujures en carbure trochoïdal avec brise-copeaux pour l'usinage à haute productivité des groupes de matériaux ISO P, M, K, S.

🇪🇸 Fresa trocoidal de metal duro 5F con rompevirutas para mecanizado de alta productividad en grupos de materiales ISO P, M, K, S.

🇷🇺 Трохоидальная концевая фреза 5F со стружколомом для высокопроизводительной обработки материалов групп ISO P, M, K, S.



- Unequal pitch, variable helix, and different core diameter design guarantee minimum vibration and extended tool life under high metal removal rate application.
- Special edge design and optimized chipbreaker allow small chips and high feed.
- Trochoidal milling strategy allows short machining time and low cutting force.



- Le pas décalé, l'hélice variable et le diamètre différent du noyau garantissent un minimum de vibrations et une durée de vie prolongée de l'outil dans les applications à grand passage.
- La conception spéciale des arêtes et l'optimisation du brise-copeaux permettent d'obtenir de petits copeaux et une alimentation élevée.
- La stratégie de fraisage trochoïdal permet un temps d'usinage court et une faible effort de coupe.



- Passo differenziato, elica variabile e diametro del nocciolo differenziato assicurano le minime vibrazioni e vita utensile prolungata in applicazioni con grandi passate.
- Design speciale del tagliente e rompitrucolo ottimizzato per trucioli piccoli e alto avanzamento.
- La strategia di fresatura trocoidale consente ridotti tempi di lavorazione e basse forze di taglio.



- El paso diferenciado, la hélice variable y el diseño de diferentes diámetros del núcleo garantizan una vibración mínima y una mayor vida útil de la herramienta en aplicaciones con alto volumen de arranque del metal.
- El diseño especial del filo y el rompivirutas optimizado permiten obtener virutas pequeñas y un alto avance.
- La estrategia de fresado trocoidal permite reducir el tiempo de mecanizado y l'esfuerzo de corte.



- Mit ungleichem Drall und Winkel und einem speziellen Design der Nuten, wird ein vibrationsfreier Ablauf, eine hohe Standzeit und ein extrem hoher Zerspanungsvolumen garantiert.
- Ein spezielles Design der Schneiden in Verbindung zu einem optimierten Spanbrecher, ermöglichen sehr kleine Späne und hohe Vorschübe.
- Trochoidalfräsen ermöglicht schnelle Bearbeitungszeiten und sehr geringe Schnittkräfte.



- Неравный шаг, переменный угол канавки и неравный диаметр стержня обеспечивают минимальную вибрацию и увеличенный срок службы инструмента при работе с большими проходками.
- Специальная форма режущей кромки и оптимизированный стружколом обеспечивают мелкую стружку и высокую подачу.
- Стратегия трохоидального фрезерования позволяет сократить время обработки и снизить усилие резания.

HF535T

	Material Group ISO 513	P1 P2 P7 K1	P3 P4 M1 K2 K3	P5 P6 M2 M3 K4 S1 S4	S2 S3 S5
	Hardness/Rm	≤700 N/mm ²	600÷1000 N/mm ²	≤35 HRC	≤45 HRC
	ap x ae	3.5D x 0.05D	3.5D x 0.05D	3.5D x 0.05D	3.5D x 0.05D
	Vc (m/min)	170÷190	100÷120	80÷100	60÷80
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	10	0.100	0.100	0.080	0.072
	12	0.120	0.120	0.100	0.090
	16	0.150	0.150	0.130	0.117
20	0.150	0.150	0.150	0.135	

	Material Group ISO 513	P1 P2 P7 K1	P3 P4 M1 K2 K3	P5 P6 M2 M3 K4 S1 S4	S2 S3 S5
	Hardness/Rm	≤700 N/mm ²	600÷1000 N/mm ²	≤35 HRC	≤45 HRC
	ap x ae	3.5D x 0.05D	3.5D x 0.05D	3.5D x 0.05D	3.5D x 0.05D
	Vc (m/min)	170÷190	100÷120	80÷100	60÷80
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	10	0.100	0.100	0.080	0.072
	12	0.120	0.120	0.100	0.090
	16	0.150	0.150	0.130	0.117
20	0.150	0.150	0.150	0.135	

NOTES:

Down milling CNC programming is required.

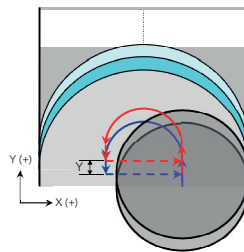
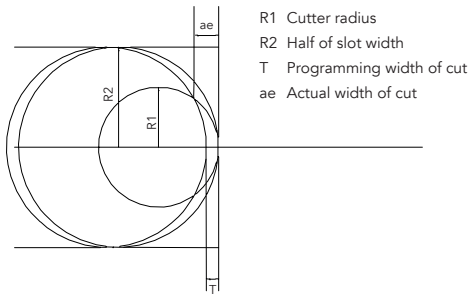
“ae” value max 0.2xD - “T” value max 0.1xD.

The use of end mill with diameter 30-40% smaller than the width of the slot is recommended.

The cutting conditions are based on CNC programming with medium dynamic speed.

With lower CNC dynamic speed, use the same cutting conditions or reduce the cutting speed Vc.

With higher CNC dynamic speed, reduce the “T” value by approximately -30 -50% and apply the maximum available cutting speed Vc.





ALU

NON-FERROUS MATERIALS

✚ Uncoated micrograin carbide and cutting geometry specifically developed for non-ferrous machining. Lapped cutting edges and ad-hoc profile of the chip pocket for low cutting forces and outstanding finishing quality. Also available in the HF ALU version with unequal pitch (UP) with a specific design allowing mirror finishing and DxD machining, even in the 4-flutes version.

🇮🇹 Micrograna non rivestita e geometria di taglio sviluppata specificamente per la lavorazione di materiali non-ferrosi. Taglienti lappati e particolare profilo del vano truciolo per bassi sforzi di taglio e un'eccellente finitura superficiale. Disponibile anche la versione HF Alu con passo differenziato (UP) con un particolare design che permette finiture a specchio e lavorazioni DxD, anche nella versione a 4 taglienti.

🇩🇪 Unbeschichtete Mikrokörnung und eigens für die Bearbeitung von NE-Metallen entwickelte Schnittgeometrie. Dank der geläpften Schneiden und der besonderen Form der Nuten ist die aufzubringende Schnittkraft gering, bei gleichzeitig ausgezeichnetem Oberflächenfinish. Auch in der Version HF Alu mit ungleicher Teilung (UP) und besonderer Form erhältlich, die auch in der Version mit 4 Schneiden ein spiegelblankes Oberflächenfinish und DxD-Bearbeitungen ermöglicht.

🇫🇷 Micrograin non revêtu et géométrie de coupe développée spécifiquement pour l'usinage de matériaux non ferreux. Arêtes de coupe polies et profil particulier de la goujure pour de faibles efforts de coupe et une excellente finition superficielle. Également disponible la version HF Alu à pas décalé(UP), avec un design particulier qui permet des finitions glacées et des usinages DxD, aussi dans la version à 4 arêtes de coupe.

🇪🇸 Micrograna no revestida y geometría de corte desarrollada específicamente para la elaboración de materiales no ferrosos. Filos de corte lapeados y perfil especial del compartimento de virutas, para bajos esfuerzos de corte y un excelente acabado de la superficie. También está disponible la versión HF Alu con paso diferenciado (UP) con un diseño especial que permite acabados a espejo y elaboraciones D x D, incluso en la versión de 4 filos.

🇷🇺 Мелкозернистый твердый сплав без покрытия со специально разработанной геометрией для обработки цветных металлов. Доведенные режущие кромки и специальный профиль стружечных канавок снижают силы резания и улучшают качество обработанной поверхности. Также доступна версия HF Alu с неравномерным шагом (UP) и специальной геометрией, позволяющая получать зеркальную поверхность и работать в режиме DxD, в том числе для версии с 4-мя зубьями.

HFAL3

	Material Group ISO 513	N1	N2 N3	N4	N5
	Hardness/Rm				
	ap x ae	D x D	D x D	D x D	D x D
	Vc (m/min)	300÷500	200÷400	150÷350	600÷900
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	2	0.022	0.019	0.015	0.024
	3	0.033	0.028	0.023	0.036
	4	0.044	0.037	0.031	0.048
	5	0.055	0.047	0.039	0.061
	6	0.065	0.055	0.046	0.072
	8	0.086	0.073	0.060	0.095
	10	0.105	0.089	0.074	0.116
	12	0.120	0.102	0.084	0.132
	14	0.140	0.119	0.098	0.154
16	0.160	0.136	0.112	0.176	
18	0.176	0.150	0.123	0.194	
20	0.195	0.166	0.137	0.215	

	Material Group ISO 513	N1	N2 N3	N4	N5
	Hardness/Rm				
	ap x ae	1.5D x 0.5D	1.5D x 0.5D	1.5D x 0.5D	1.5D x 0.5D
	Vc (m/min)	300÷600	200÷500	200÷400	600÷1000
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	2	0.026	0.024	0.021	0.029
	3	0.040	0.036	0.032	0.044
	4	0.053	0.048	0.042	0.058
	5	0.066	0.059	0.053	0.073
	6	0.078	0.070	0.062	0.086
	8	0.103	0.093	0.083	0.114
	10	0.126	0.113	0.101	0.139
	12	0.144	0.130	0.115	0.158
	14	0.168	0.151	0.134	0.185
16	0.192	0.173	0.154	0.211	
18	0.211	0.190	0.169	0.232	
20	0.234	0.211	0.187	0.257	

	Material Group ISO 513	N1	N2 N3	N4	N5
	Hardness/Rm				
	ap x ae	8° x 0.5D	5° x 0.5D	5° x 0.5D	8° x 0.5D
	Vc (m/min)	300÷500	200÷400	150÷350	600÷900
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
	2	0.015	0.014	0.011	0.017
	3	0.023	0.020	0.017	0.025
	4	0.030	0.027	0.022	0.033
	5	0.038	0.034	0.028	0.042
	6	0.045	0.040	0.033	0.049
	8	0.059	0.053	0.044	0.065
	10	0.073	0.065	0.054	0.080
	12	0.083	0.074	0.061	0.091
	14	0.097	0.087	0.071	0.106
16	0.111	0.099	0.082	0.122	
18	0.122	0.109	0.090	0.134	
20	0.135	0.121	0.099	0.148	



HFAL3

	Material Group ISO 513	N1	N2 N3	N4	N5
	Hardness/Rm				
	ap x ae	15° x D	10° x D	7° x D	15° x D
	Vc (m/min)	300÷500	200÷400	150÷350	600÷900
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
2	0.015	0.013	0.011	0.016	
3	0.022	0.019	0.016	0.024	
4	0.029	0.025	0.022	0.032	
5	0.037	0.032	0.027	0.040	
6	0.043	0.038	0.032	0.048	
8	0.057	0.050	0.042	0.063	
10	0.070	0.061	0.051	0.077	
12	0.080	0.069	0.059	0.088	
14	0.093	0.081	0.069	0.102	
16	0.106	0.092	0.078	0.117	
18	0.117	0.102	0.086	0.129	
20	0.130	0.113	0.096	0.143	

	Material Group ISO 513	N1	N2 N3	N4	N5
	Hardness/Rm				
	ap x ae	D x 0.4D	D x 0.4D	D x 0.4D	D x 0.4D
	Vc (m/min)	300÷500	200÷400	150÷350	600÷900
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
2	0.022	0.020	0.018	0.024	
3	0.033	0.030	0.026	0.036	
4	0.044	0.040	0.035	0.048	
5	0.055	0.050	0.044	0.061	
6	0.065	0.059	0.052	0.072	
8	0.086	0.077	0.069	0.095	
10	0.105	0.095	0.084	0.116	
12	0.120	0.108	0.096	0.132	
14	0.140	0.126	0.112	0.154	
16	0.160	0.144	0.128	0.176	
18	0.176	0.158	0.141	0.194	
20	0.195	0.176	0.156	0.215	

	Material Group ISO 513	N1	N2 N3	N4	N5
	Hardness/Rm				
	ap x ae	D x D	D x D	0.5D x D	0.5D x D
	Vc (m/min)	270÷370	190÷290	150÷250	500÷700
	D (mm)	fz (mm/z)	fz (mm/z)	fz (mm/z)	fz (mm/z)
2	0.011	0.010	0.009	0.012	
3	0.017	0.015	0.013	0.018	
4	0.022	0.020	0.018	0.024	
5	0.028	0.025	0.022	0.030	
6	0.033	0.029	0.026	0.036	
8	0.043	0.039	0.034	0.047	
10	0.053	0.047	0.042	0.058	
12	0.060	0.054	0.048	0.066	
14	0.070	0.063	0.056	0.077	
16	0.080	0.072	0.064	0.088	
18	0.088	0.079	0.070	0.097	
20	0.098	0.088	0.078	0.107	

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

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