



**uemme**  
TOOLS and EQUIPMENT

 **OSAWA**  
D R I L L S   &   E N D   M I L L S



**OSW23** UPDATE



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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/mm<sup>2</sup>.

🇮🇹 La soluzione ideale per la foratura di materiali ISO P, M, K, N sino a 1100 N/mm<sup>2</sup>.

🇩🇪 Die optimale Lösung für das Bohren der Materialien ISO P, M, K, N bis zu 1100 N/mm<sup>2</sup>.

🇫🇷 La solution idéale pour le perçage de matériaux ISO P, M, K, N jusqu'à 1100 N/mm<sup>2</sup>.

🇪🇸 La solución ideal para el taladrado de materiales ISO P, M, K, N hasta 1100 N/mm<sup>2</sup>.

🇷🇺 Идеальное решение для сверления материалов по ISO P, M, K, N до 1100 Н/мм<sup>2</sup>.



- 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
- Chaflán 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

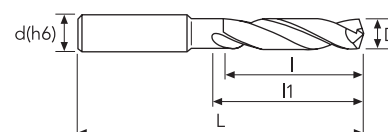
General purpose



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

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ★ | ☆ | ☆ | ☆ |   |   |

★ 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 | ●     |
| 4.70  | +0.016/+0.004 | 6     | 17 | 24 | 66 | 353CV0470 | ●     |
| 4.80  | +0.016/+0.004 | 6     | 20 | 28 | 66 | 353CV0480 | ●     |

# 353CV

General purpose

3XD

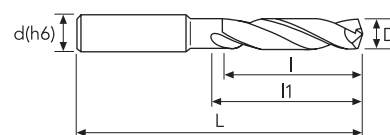
DIN  
6537KMG  
PV250

353CV replaces 343TA.

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

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ★ | ☆ | ☆ | ☆ |   |   |

★ 1st choice ☆ suitable



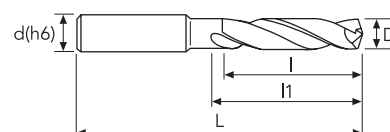
| D(m7) | D Tol.        | d(h6) | l  | l1 | L  | EDP No.   | Stock |
|-------|---------------|-------|----|----|----|-----------|-------|
| 4.90  | +0.016/+0.004 | 6     | 20 | 28 | 66 | 353CV0490 | ●     |
| 5.00  | +0.016/+0.004 | 6     | 20 | 28 | 66 | 353CV0500 | ●     |
| 5.10  | +0.016/+0.004 | 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

## General purpose



★ 1st choice    ☆ suitable

[illegible]

## CUTTING PARAMETERS

## 353CV

|  | Material Group<br>ISO 513 | P1 P2 P3               | P7                     | M1                     | K1             | N1 N2          |  |
|-----------------------------------------------------------------------------------|---------------------------|------------------------|------------------------|------------------------|----------------|----------------|--|
|                                                                                   | Hardness/Rm               | <800 N/mm <sup>2</sup> | <700 N/mm <sup>2</sup> | <750 N/mm <sup>2</sup> | 150÷200 HB     |                |  |
|                                                                                   | Vc (m/min)                | <b>80÷100</b>          | <b>35÷45</b>           | <b>35÷45</b>           | <b>80÷100</b>  | <b>140÷180</b> |  |
|                                                                                   | D<br>(mm)                 | fn<br>(mm/rev)         | fn<br>(mm/rev)         | fn<br>(mm/rev)         | fn<br>(mm/rev) | fn<br>(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 and 5xD with Weldon shank, 8xD with cylindrical shank for general application on ISO P, M, K

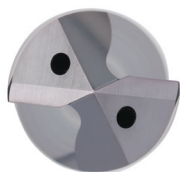
🇮🇹 3xD e 5xD con gambo Weldon, 8xD con gambo cilindrico per applicazioni generali su ISO P, M, K

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

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

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

🇷🇺 3xD и 5xD с хвостовиком Weldon, 8xD с цилиндрическим хвостовиком 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.



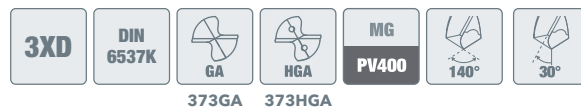
- Selbstzentrierender Schliff für präzise Bohrungen
- Aus VHM Mikrokörnung und neue PV400 Beschichtung um bessere Verschleissbeständigkeit zu ermöglichen.
- Gerades Schnittkantendesign und optimaler Schliff für eine hohe Zuverlässigkeit des Werkzeugs.
- Optimierter Kerndurchmesser für gerade Bohrungen, 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 сердцевин гарантирует прямолинейность отверстия, а конструкция с широкими канавками обеспечивает беспрепятственный выброс стружки.

# 373GA-HGA

General application, Weldon shank



373GA

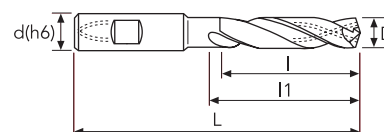


373HGA

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ★ |   | ★ |   |   |   |
| ★ | ☆ | ★ |   |   |   |

373GA  
373HGA

★ 1st choice ☆ suitable



| D(m7) | D Tol.        | d(h6) | l  | l1 | L  | 373GA<br>EDP No. | Stock | 373HGA<br>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



373GA



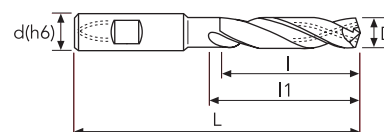
373HGA

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ★ |   | ★ |   |   |   |
| ★ | ☆ | ★ |   |   |   |

373GA

373HGA

★ 1st choice ☆ suitable



| D(m7) | D Tol.        | d(h6) | l  | l1 | L   | 373GA<br>EDP No. | Stock | 373HGA<br>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



373GA



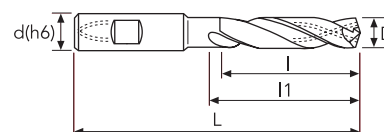
373HGA

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ★ |   | ★ |   |   |   |
| ★ | ☆ | ★ |   |   |   |

373GA

373HGA

★ 1st choice ☆ suitable



| D(m7) | D Tol.        | d(h6) | l  | l1 | L   | 373GA<br>EDP No. | Stock | 373HGA<br>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

General application, Weldon shank



Technical drawing of a drill bit showing dimensions:  $d(h6)$  for diameter,  $L$  for total length,  $l$  for cutting length, and  $l_1$  for cutting length with double-flute.

● stock standard    ○ non-standard stock

## CUTTING PARAMETERS

## 373GA

| <br>Ø RUN OUT<br><0.02mm | Material Group<br>ISO 513 | P1                     | P2                        | P3 P4                      | P5 P6                      | P7                     | P8                         |
|-----------------------------------------------------------------------------------------------------------|---------------------------|------------------------|---------------------------|----------------------------|----------------------------|------------------------|----------------------------|
|                                                                                                           | Hardness/Rm               | <500 N/mm <sup>2</sup> | 500÷700 N/mm <sup>2</sup> | 600÷1000 N/mm <sup>2</sup> | 900÷1480 N/mm <sup>2</sup> | <750 N/mm <sup>2</sup> | 850÷1200 N/mm <sup>2</sup> |
|                                                                                                           | Vc (m/min)                | <b>70÷90</b>           | <b>60÷80</b>              | <b>60÷80</b>               | <b>50÷70</b>               | <b>40÷60</b>           | <b>35÷55</b>               |
|                                                                                                           | D<br>(mm)                 | fn<br>(mm/rev)         | fn<br>(mm/rev)            | fn<br>(mm/rev)             | fn<br>(mm/rev)             | fn<br>(mm/rev)         | fn<br>(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

| <br>Ø RUN OUT<br><0.02mm | Material Group<br>ISO 513 | P1                     | P2                        | P3 P4                      | P5 P6                      | P7                     | P8                         |
|-------------------------------------------------------------------------------------------------------------|---------------------------|------------------------|---------------------------|----------------------------|----------------------------|------------------------|----------------------------|
|                                                                                                             | Hardness/Rm               | <500 N/mm <sup>2</sup> | 500÷700 N/mm <sup>2</sup> | 600÷1000 N/mm <sup>2</sup> | 900÷1480 N/mm <sup>2</sup> | <750 N/mm <sup>2</sup> | 850÷1200 N/mm <sup>2</sup> |
|                                                                                                             | Vc (m/min)                | <b>90÷110</b>          | <b>70÷90</b>              | <b>70÷90</b>               | <b>50÷70</b>               | <b>50÷70</b>           | <b>40÷60</b>               |
|                                                                                                             | D<br>(mm)                 | fn<br>(mm/rev)         | fn<br>(mm/rev)            | fn<br>(mm/rev)             | fn<br>(mm/rev)             | fn<br>(mm/rev)         | fn<br>(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

| <br>Ø RUN OUT<br><0.02mm | Material Group<br>ISO 513 | M1                     | M2                        | M3                        |  |  |  |
|-------------------------------------------------------------------------------------------------------------|---------------------------|------------------------|---------------------------|---------------------------|--|--|--|
|                                                                                                             | Hardness/Rm               | <750 N/mm <sup>2</sup> | 550÷850 N/mm <sup>2</sup> | 650÷950 N/mm <sup>2</sup> |  |  |  |
|                                                                                                             | Vc (m/min)                | <b>50÷70</b>           | <b>50÷70</b>              | <b>35÷55</b>              |  |  |  |
|                                                                                                             | D<br>(mm)                 | fn<br>(mm/rev)         | fn<br>(mm/rev)            | fn<br>(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                     |  |  |  |

## CUTTING PARAMETERS

## 373GA

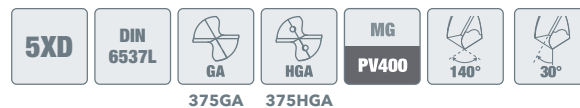
|  | Material Group<br>ISO 513 | <b>K1</b>      | <b>K2</b>      | <b>K3</b>      |  |  |  |
|-----------------------------------------------------------------------------------|---------------------------|----------------|----------------|----------------|--|--|--|
|                                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

## 373HGA

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

# 375GA-HGA

General application, Weldon shank



375GA

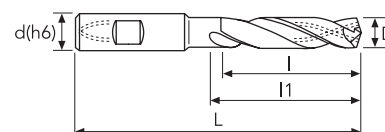


375HGA

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ★ |   | ★ |   |   |   |
| ★ | ☆ | ★ |   |   |   |

375GA  
375HGA

★ 1st choice ☆ suitable



| D(m7) | D Tol.        | d(h6) | l    | l1 | L  | 375GA<br>EDP No. | Stock | 375HGA<br>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

375GA 375HGA



375GA



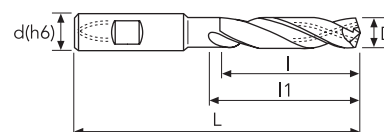
375HGA

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ★ |   | ★ |   |   |   |
| ★ | ☆ | ★ |   |   |   |

375GA

375HGA

★ 1st choice ☆ suitable

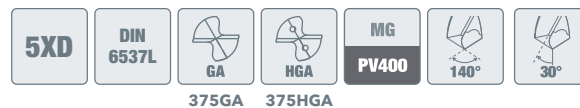


| D(m7) | D Tol.        | d(h6) | l    | l1 | L   | 375GA<br>EDP No. | Stock | 375HGA<br>EDP No. | Stock |
|-------|---------------|-------|------|----|-----|------------------|-------|-------------------|-------|
| 6,7   | +0.006/+0.021 | 8     | 43,0 | 53 | 91  | 375GA0670        | ●     | 375HGA0670        | ●     |
| 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



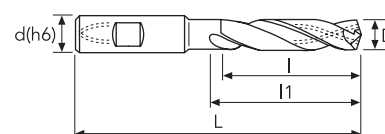
375HGA

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ★ |   | ★ |   |   |   |
| ★ | ☆ | ★ |   |   |   |

★ 1st choice ☆ suitable

375GA

375HGA



| D(m7) | D Tol.        | d(h6) | l    | l1 | L   | 375GA<br>EDP No. | Stock | 375HGA<br>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

General application, Weldon shank



Technical drawing of a drill bit showing dimensions:  $d(h6)$  for diameter,  $L$  for total length,  $l$  for cutting length, and  $l_1$  for cutting length with double-flute.

● stock standard    ○ non-standard stock

## CUTTING PARAMETERS

## 375GA

| <br>Ø RUN OUT<br><0.02mm | Material Group<br>ISO 513 | P1                     | P2                        | P3 P4                      | P5 P6                      | P7                     | P8                         |
|-----------------------------------------------------------------------------------------------------------|---------------------------|------------------------|---------------------------|----------------------------|----------------------------|------------------------|----------------------------|
|                                                                                                           | Hardness/Rm               | <500 N/mm <sup>2</sup> | 500÷700 N/mm <sup>2</sup> | 600÷1000 N/mm <sup>2</sup> | 900÷1480 N/mm <sup>2</sup> | <750 N/mm <sup>2</sup> | 850÷1200 N/mm <sup>2</sup> |
|                                                                                                           | Vc (m/min)                | <b>70÷90</b>           | <b>60÷80</b>              | <b>60÷80</b>               | <b>50÷70</b>               | <b>40÷60</b>           | <b>35÷55</b>               |
|                                                                                                           | D<br>(mm)                 | fn<br>(mm/rev)         | fn<br>(mm/rev)            | fn<br>(mm/rev)             | fn<br>(mm/rev)             | fn<br>(mm/rev)         | fn<br>(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

| <br>Ø RUN OUT<br><0.02mm | Material Group<br>ISO 513 | P1                     | P2                        | P3 P4                      | P5 P6                      | P7                     | P8                         |
|-------------------------------------------------------------------------------------------------------------|---------------------------|------------------------|---------------------------|----------------------------|----------------------------|------------------------|----------------------------|
|                                                                                                             | Hardness/Rm               | <500 N/mm <sup>2</sup> | 500÷700 N/mm <sup>2</sup> | 600÷1000 N/mm <sup>2</sup> | 900÷1480 N/mm <sup>2</sup> | <750 N/mm <sup>2</sup> | 850÷1200 N/mm <sup>2</sup> |
|                                                                                                             | Vc (m/min)                | <b>90÷110</b>          | <b>70÷90</b>              | <b>70÷90</b>               | <b>50÷70</b>               | <b>50÷70</b>           | <b>40÷60</b>               |
|                                                                                                             | D<br>(mm)                 | fn<br>(mm/rev)         | fn<br>(mm/rev)            | fn<br>(mm/rev)             | fn<br>(mm/rev)             | fn<br>(mm/rev)         | fn<br>(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

| <br>Ø RUN OUT<br><0.02mm | Material Group<br>ISO 513 | M1                     | M2                        | M3                        |  |  |  |
|-------------------------------------------------------------------------------------------------------------|---------------------------|------------------------|---------------------------|---------------------------|--|--|--|
|                                                                                                             | Hardness/Rm               | <750 N/mm <sup>2</sup> | 550÷850 N/mm <sup>2</sup> | 650÷950 N/mm <sup>2</sup> |  |  |  |
|                                                                                                             | Vc (m/min)                | <b>50÷70</b>           | <b>50÷70</b>              | <b>35÷55</b>              |  |  |  |
|                                                                                                             | D<br>(mm)                 | fn<br>(mm/rev)         | fn<br>(mm/rev)            | fn<br>(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                     |  |  |  |

## CUTTING PARAMETERS

## 375GA

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

## 375HGA

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

# 358HGA

General purpose, long (8xD)

8XD

OSAWA  
NORM

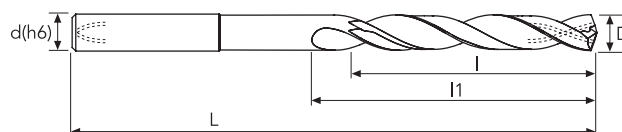
  
HGA
MG  
PV400

  
140°


  
30°


| 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 purpose, long (8xD)

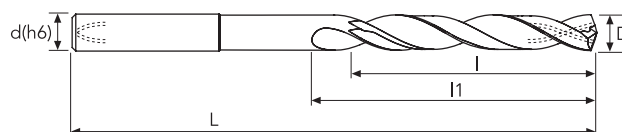
8XD

OSAWA  
NORM
 HGA
MG  
PV400
 140°

 30°


| 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 purpose, long (8xD)

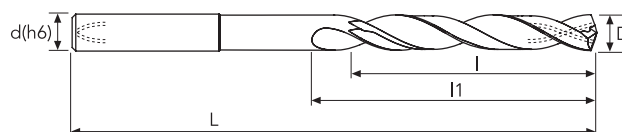
8XD

OSAWA  
NORM
 HGA
MG  
PV400
 140°

 30°


| 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

## CUTTING PARAMETERS

## 358HGA

| <br>Ø RUN OUT<br><0.02mm | Material Group<br>ISO 513 | P1                     | P2                        | P3 P4                      | P5 P6                      | P7                     | P8                         |
|-----------------------------------------------------------------------------------------------------------|---------------------------|------------------------|---------------------------|----------------------------|----------------------------|------------------------|----------------------------|
|                                                                                                           | Hardness/Rm               | <500 N/mm <sup>2</sup> | 500÷700 N/mm <sup>2</sup> | 600÷1000 N/mm <sup>2</sup> | 900÷1480 N/mm <sup>2</sup> | <700 N/mm <sup>2</sup> | 850÷1200 N/mm <sup>2</sup> |
|                                                                                                           | Vc (m/min)                | <b>80÷100</b>          | <b>65÷85</b>              | <b>65÷85</b>               | <b>45÷65</b>               | <b>45÷65</b>           | <b>35÷55</b>               |
|                                                                                                           | D<br>(mm)                 | fn<br>(mm/rev)         | fn<br>(mm/rev)            | fn<br>(mm/rev)             | fn<br>(mm/rev)             | fn<br>(mm/rev)         | fn<br>(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

| <br>Ø RUN OUT<br><0.02mm | Material Group<br>ISO 513 | M1                     | M2                        | M3                        |  |  |  |
|-------------------------------------------------------------------------------------------------------------|---------------------------|------------------------|---------------------------|---------------------------|--|--|--|
|                                                                                                             | Hardness/Rm               | <750 N/mm <sup>2</sup> | 550÷850 N/mm <sup>2</sup> | 650÷950 N/mm <sup>2</sup> |  |  |  |
|                                                                                                             | Vc (m/min)                | <b>40÷60</b>           | <b>40÷60</b>              | <b>30÷50</b>              |  |  |  |
|                                                                                                             | D<br>(mm)                 | fn<br>(mm/rev)         | fn<br>(mm/rev)            | fn<br>(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

| <br>Ø RUN OUT<br><0.02mm | Material Group<br>ISO 513 | K1             | K2             | K3             |  |  |  |
|-------------------------------------------------------------------------------------------------------------|---------------------------|----------------|----------------|----------------|--|--|--|
|                                                                                                             | Hardness/Rm               | 150÷250 HB     | 150÷350 HB     | 250÷500 HB     |  |  |  |
|                                                                                                             | Vc (m/min)                | <b>100÷120</b> | <b>80÷100</b>  | <b>65÷85</b>   |  |  |  |
|                                                                                                             | D<br>(mm)                 | fn<br>(mm/rev) | fn<br>(mm/rev) | fn<br>(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

3XD

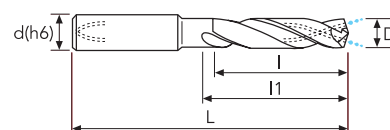
DIN  
6537K

353HVA replaces 353SUH.

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

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ☆ | ★ |   |   | ☆ |   |

★ 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

3XD

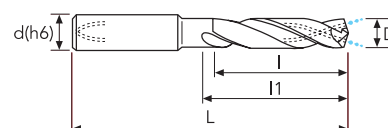
DIN  
6537K

353HVA replaces 353SUH.

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

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ☆ | ★ |   |   | ☆ |   |

★ 1st choice ☆ suitable



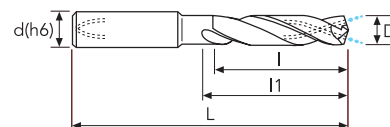
| D(m7) | D Tol.        | d(h6) | l  | l1 | L   | EDP No.    | Stock |
|-------|---------------|-------|----|----|-----|------------|-------|
| 6.90  | +0.021/+0.006 | 8     | 24 | 34 | 79  | 353HVA0690 | ●     |
| 7.00  | +0.021/+0.006 | 8     | 24 | 34 | 79  | 353HVA0700 | ●     |
| 7.10  | +0.021/+0.006 | 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 | ●     |

Stainless steel



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

★ 1st choice    ☆ suitable



● stock standard    ○ non-standard stock    ▽ stock exhaustion

## CUTTING PARAMETERS

## 353HVA

| <br>Ø RUN OUT<br><0.02mm | Material Group<br>ISO 513 | <div>P1</div> <div>P2</div> | <div>P3</div> <div>P4</div> | <div>P5</div>              | <div>P6</div>               | <div>P7</div>          | <div>P8</div>              |
|-----------------------------------------------------------------------------------------------------------|---------------------------|-----------------------------|-----------------------------|----------------------------|-----------------------------|------------------------|----------------------------|
|                                                                                                           | Hardness/Rm               | 500÷700 N/mm <sup>2</sup>   | 600÷1000 N/mm <sup>2</sup>  | 900÷1200 N/mm <sup>2</sup> | 1200÷1400 N/mm <sup>2</sup> | <700 N/mm <sup>2</sup> | 850÷1200 N/mm <sup>2</sup> |
|                                                                                                           | Vc (m/min)                | <b>100÷140</b>              | <b>80÷120</b>               | <b>70÷90</b>               | <b>50÷70</b>                | <b>50÷70</b>           | <b>20÷30</b>               |
|                                                                                                           | D<br>(mm)                 | fn<br>(mm/rev)              | fn<br>(mm/rev)              | fn<br>(mm/rev)             | fn<br>(mm/rev)              | fn<br>(mm/rev)         | fn<br>(mm/rev)             |
|                                                                                                           | <b>3</b>                  | 0.118                       | 0.106                       | 0.095                      | 0.083                       | 0.077                  | 0.046                      |
|                                                                                                           | <b>4</b>                  | 0.140                       | 0.126                       | 0.112                      | 0.098                       | 0.091                  | 0.055                      |
|                                                                                                           | <b>5</b>                  | 0.161                       | 0.145                       | 0.129                      | 0.113                       | 0.105                  | 0.063                      |
|                                                                                                           | <b>6</b>                  | 0.183                       | 0.164                       | 0.146                      | 0.128                       | 0.119                  | 0.071                      |
|                                                                                                           | <b>7</b>                  | 0.204                       | 0.184                       | 0.163                      | 0.143                       | 0.133                  | 0.080                      |
|                                                                                                           | <b>8</b>                  | 0.226                       | 0.203                       | 0.181                      | 0.158                       | 0.147                  | 0.088                      |
|                                                                                                           | <b>9</b>                  | 0.247                       | 0.223                       | 0.198                      | 0.173                       | 0.161                  | 0.096                      |
|                                                                                                           | <b>10</b>                 | 0.269                       | 0.242                       | 0.215                      | 0.188                       | 0.175                  | 0.105                      |
|                                                                                                           | <b>11</b>                 | 0.280                       | 0.252                       | 0.224                      | 0.196                       | 0.182                  | 0.109                      |
|                                                                                                           | <b>12</b>                 | 0.301                       | 0.271                       | 0.241                      | 0.211                       | 0.196                  | 0.117                      |
|                                                                                                           | <b>13</b>                 | 0.323                       | 0.290                       | 0.258                      | 0.226                       | 0.210                  | 0.126                      |
|                                                                                                           | <b>14</b>                 | 0.344                       | 0.310                       | 0.275                      | 0.241                       | 0.224                  | 0.134                      |
|                                                                                                           | <b>15</b>                 | 0.366                       | 0.329                       | 0.292                      | 0.256                       | 0.238                  | 0.143                      |
|                                                                                                           | <b>16</b>                 | 0.387                       | 0.348                       | 0.310                      | 0.271                       | 0.252                  | 0.151                      |
|                                                                                                           | <b>17</b>                 | 0.398                       | 0.358                       | 0.318                      | 0.278                       | 0.259                  | 0.155                      |
|                                                                                                           | <b>18</b>                 | 0.409                       | 0.368                       | 0.327                      | 0.286                       | 0.266                  | 0.159                      |
|                                                                                                           | <b>19</b>                 | 0.419                       | 0.377                       | 0.335                      | 0.293                       | 0.273                  | 0.164                      |
| <b>20</b>                                                                                                 | 0.430                     | 0.387                       | 0.344                       | 0.301                      | 0.280                       | 0.168                  |                            |

| <br>Ø RUN OUT<br><0.02mm | Material Group<br>ISO 513 | M1                     | M2                        | M3                        |  |  |
|-------------------------------------------------------------------------------------------------------------|---------------------------|------------------------|---------------------------|---------------------------|--|--|
|                                                                                                             | Hardness/Rm               | <750 N/mm <sup>2</sup> | 550÷850 N/mm <sup>2</sup> | 650÷950 N/mm <sup>2</sup> |  |  |
|                                                                                                             | Vc (m/min)                | <b>50÷70</b>           | <b>45÷65</b>              | <b>35÷50</b>              |  |  |
|                                                                                                             | D<br>(mm)                 | fn<br>(mm/rev)         | fn<br>(mm/rev)            | fn<br>(mm/rev)            |  |  |
| <b>3</b>                                                                                                    | 0.077                     | 0.061                  | 0.054                     |                           |  |  |
| <b>4</b>                                                                                                    | 0.091                     | 0.073                  | 0.064                     |                           |  |  |
| <b>5</b>                                                                                                    | 0.105                     | 0.084                  | 0.073                     |                           |  |  |
| <b>6</b>                                                                                                    | 0.119                     | 0.095                  | 0.083                     |                           |  |  |
| <b>7</b>                                                                                                    | 0.133                     | 0.106                  | 0.093                     |                           |  |  |
| <b>8</b>                                                                                                    | 0.147                     | 0.117                  | 0.103                     |                           |  |  |
| <b>9</b>                                                                                                    | 0.161                     | 0.129                  | 0.112                     |                           |  |  |
| <b>10</b>                                                                                                   | 0.175                     | 0.140                  | 0.122                     |                           |  |  |
| <b>11</b>                                                                                                   | 0.182                     | 0.145                  | 0.127                     |                           |  |  |
| <b>12</b>                                                                                                   | 0.196                     | 0.157                  | 0.137                     |                           |  |  |
| <b>13</b>                                                                                                   | 0.210                     | 0.168                  | 0.147                     |                           |  |  |
| <b>14</b>                                                                                                   | 0.224                     | 0.179                  | 0.157                     |                           |  |  |
| <b>15</b>                                                                                                   | 0.238                     | 0.190                  | 0.166                     |                           |  |  |
| <b>16</b>                                                                                                   | 0.252                     | 0.201                  | 0.176                     |                           |  |  |
| <b>17</b>                                                                                                   | 0.259                     | 0.207                  | 0.181                     |                           |  |  |
| <b>18</b>                                                                                                   | 0.266                     | 0.212                  | 0.186                     |                           |  |  |
| <b>19</b>                                                                                                   | 0.273                     | 0.218                  | 0.191                     |                           |  |  |
| <b>20</b>                                                                                                   | 0.280                     | 0.224                  | 0.196                     |                           |  |  |

## CUTTING PARAMETERS

## 353HVA

| <br>Ø RUN OUT<br><0.02mm | Material Group<br>ISO 513 | S1 S2                 | S3             | S4                      | S5             |              |              |
|-----------------------------------------------------------------------------------------------------------|---------------------------|-----------------------|----------------|-------------------------|----------------|--------------|--------------|
|                                                                                                           | Hardness/Rm               | <35 N/mm <sup>2</sup> |                | 35÷45 N/mm <sup>2</sup> |                |              |              |
|                                                                                                           | Vc (m/min)                | <b>30÷50</b>          |                | <b>25÷45</b>            |                | <b>30÷45</b> | <b>25÷35</b> |
|                                                                                                           | D<br>(mm)                 | fn<br>(mm/rev)        | fn<br>(mm/rev) | fn<br>(mm/rev)          | fn<br>(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

5XD

DIN  
6537L

  
HVA
MG  
PV350

  
140°

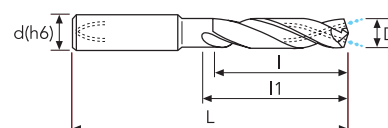

  
30°


355HVA replaces 355SUH.

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

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ☆ | ★ |   |   | ☆ |   |

★ 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

5XD

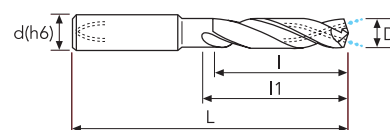
DIN  
6537LMG  
PV350

355HVA replaces 355SUH.

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

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ☆ | ★ |   |   | ☆ |   |

★ 1st choice ☆ suitable

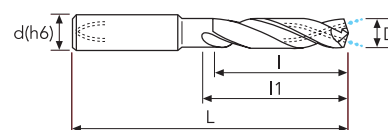


| D(m7) | D Tol.        | d(h6) | l  | l1 | L   | EDP No.    | Stock |
|-------|---------------|-------|----|----|-----|------------|-------|
| 6.90  | +0.021/+0.006 | 8     | 43 | 53 | 91  | 355HVA0690 | ●     |
| 7.00  | +0.021/+0.006 | 8     | 43 | 53 | 91  | 355HVA0700 | ●     |
| 7.10  | +0.021/+0.006 | 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 | ●     |

Stainless steel



★ 1st choice    ☆ suitable

[illegible]

## CUTTING PARAMETERS

## 355HVA

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

| <br>Ø RUN OUT<br><0.02mm | Material Group<br>ISO 513 | M1                     | M2                        | M3                        |  |  |
|-------------------------------------------------------------------------------------------------------------|---------------------------|------------------------|---------------------------|---------------------------|--|--|
|                                                                                                             | Hardness/Rm               | <750 N/mm <sup>2</sup> | 550÷850 N/mm <sup>2</sup> | 650÷950 N/mm <sup>2</sup> |  |  |
|                                                                                                             | Vc (m/min)                | <b>50÷70</b>           | <b>45÷65</b>              | <b>35÷50</b>              |  |  |
|                                                                                                             | D<br>(mm)                 | fn<br>(mm/rev)         | fn<br>(mm/rev)            | fn<br>(mm/rev)            |  |  |
| <b>3</b>                                                                                                    | 0.065                     | 0.052                  | 0.046                     |                           |  |  |
| <b>4</b>                                                                                                    | 0.077                     | 0.062                  | 0.054                     |                           |  |  |
| <b>5</b>                                                                                                    | 0.089                     | 0.071                  | 0.062                     |                           |  |  |
| <b>6</b>                                                                                                    | 0.101                     | 0.081                  | 0.071                     |                           |  |  |
| <b>7</b>                                                                                                    | 0.113                     | 0.090                  | 0.079                     |                           |  |  |
| <b>8</b>                                                                                                    | 0.125                     | 0.100                  | 0.087                     |                           |  |  |
| <b>9</b>                                                                                                    | 0.137                     | 0.109                  | 0.096                     |                           |  |  |
| <b>10</b>                                                                                                   | 0.148                     | 0.119                  | 0.104                     |                           |  |  |
| <b>11</b>                                                                                                   | 0.154                     | 0.124                  | 0.108                     |                           |  |  |
| <b>12</b>                                                                                                   | 0.166                     | 0.133                  | 0.116                     |                           |  |  |
| <b>13</b>                                                                                                   | 0.178                     | 0.143                  | 0.125                     |                           |  |  |
| <b>14</b>                                                                                                   | 0.190                     | 0.152                  | 0.133                     |                           |  |  |
| <b>15</b>                                                                                                   | 0.202                     | 0.162                  | 0.141                     |                           |  |  |
| <b>16</b>                                                                                                   | 0.214                     | 0.171                  | 0.150                     |                           |  |  |
| <b>17</b>                                                                                                   | 0.220                     | 0.176                  | 0.154                     |                           |  |  |
| <b>18</b>                                                                                                   | 0.226                     | 0.181                  | 0.158                     |                           |  |  |
| <b>19</b>                                                                                                   | 0.232                     | 0.185                  | 0.162                     |                           |  |  |
| <b>20</b>                                                                                                   | 0.238                     | 0.190                  | 0.166                     |                           |  |  |

## CUTTING PARAMETERS

## 355HVA

| <br>Ø RUN OUT<br><0.02mm | Material Group<br>ISO 513 | S1 S2                 | S3                      | S4             | S5             |  |  |
|-----------------------------------------------------------------------------------------------------------|---------------------------|-----------------------|-------------------------|----------------|----------------|--|--|
|                                                                                                           | Hardness/Rm               | <35 N/mm <sup>2</sup> | 35÷45 N/mm <sup>2</sup> |                |                |  |  |
|                                                                                                           | Vc (m/min)                | <b>30÷50</b>          | <b>25÷45</b>            | <b>30÷45</b>   | <b>25÷35</b>   |  |  |
|                                                                                                           | D<br>(mm)                 | fn<br>(mm/rev)        | fn<br>(mm/rev)          | fn<br>(mm/rev) | fn<br>(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 chaflanar 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

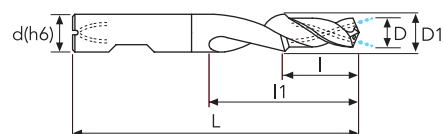
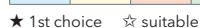


- Kombiwerkzeug: Bohren und Fasen in einem Arbeitsgang
- Gerade Schnittgeometrie: stabiles schneiden, erzeugt kleine Späne
- Nutenform: breite Nuten um die Späne besser abzuführen
- Substrat und Beschichtung: so ausgewählt um sehr flexibel auf unterschiedlichen Materialgruppen eingesetzt zu werden



- 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.

through coolant step drill for 90° chamfering,  
weldon shank, universal application

[illegible]

● stock standard    ○ non-standard stock    ▽ stock exhaustion

## CUTTING PARAMETERS

## 372HSD

| <br>Ø RUN OUT<br><0.02mm | Material Group<br>ISO 513 | P1 P2                     | P3 P4                      | P7                     |  |  |  |
|-----------------------------------------------------------------------------------------------------------|---------------------------|---------------------------|----------------------------|------------------------|--|--|--|
|                                                                                                           | Hardness/Rm               | 500÷700 N/mm <sup>2</sup> | 600÷1000 N/mm <sup>2</sup> | <700 N/mm <sup>2</sup> |  |  |  |
|                                                                                                           | Vc (m/min)                | 80÷120                    | 70÷110                     | 40÷80                  |  |  |  |
|                                                                                                           | D<br>(mm)                 | fn<br>(mm/rev)            | fn<br>(mm/rev)             | fn<br>(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

| <br>Ø RUN OUT<br><0.02mm | Material Group<br>ISO 513 | M1                     | M2                        | M3                        |  |  |  |
|-------------------------------------------------------------------------------------------------------------|---------------------------|------------------------|---------------------------|---------------------------|--|--|--|
|                                                                                                             | Hardness/Rm               | <750 N/mm <sup>2</sup> | 550÷850 N/mm <sup>2</sup> | 650÷950 N/mm <sup>2</sup> |  |  |  |
|                                                                                                             | Vc (m/min)                | 40÷80                  | 40÷80                     | 30÷60                     |  |  |  |
|                                                                                                             | D<br>(mm)                 | fn<br>(mm/rev)         | fn<br>(mm/rev)            | fn<br>(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

| <br>Ø RUN OUT<br><0.02mm | Material Group<br>ISO 513 | S1 S2          | S3             | S5             |  |  |  |
|-----------------------------------------------------------------------------------------------------------|---------------------------|----------------|----------------|----------------|--|--|--|
|                                                                                                           | Hardness/Rm               | <35 HRC        | 35÷45 HRC      |                |  |  |  |
|                                                                                                           | Vc (m/min)                | <b>30÷50</b>   | <b>30÷50</b>   | <b>25÷45</b>   |  |  |  |
|                                                                                                           | D<br>(mm)                 | fn<br>(mm/rev) | fn<br>(mm/rev) | fn<br>(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    |  |  |  |





## 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.

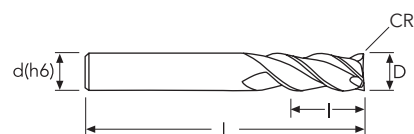
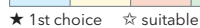
🇩🇪 Unbeschichtete Mikrokörnung und eigens für die Bearbeitung von NE-Metallen entwickelte Schnittgeometrie. Dank der geläpften Schneiden und der besonderen Form der Nuten ist die aufzubringende Schnittkraft gering, bei gleichzeitig ausgezeichnetem Oberflächenfinish. Auch in der Version HF Alu mit ungleicher 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.

cylindrical shank, 3 flutes, corner radius



● stock standard    ○ non-standard stock    ▽ stock exhaustion

## CUTTING PARAMETERS

# HFAL3

|  | Material Group<br>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<br>(mm)                 | fz<br>(mm/z) | fz<br>(mm/z) | fz<br>(mm/z) | fz<br>(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<br>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<br>(mm)                 | fz<br>(mm/z) | fz<br>(mm/z) | fz<br>(mm/z) | fz<br>(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<br>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<br>(mm)                 | fz<br>(mm/z) | fz<br>(mm/z) | fz<br>(mm/z) | fz<br>(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        |

PARAMETERS SUGGESTED WITH HIGH POWER MILLING CHUCK AND STABLE MACHINING CONDITION

## CUTTING PARAMETERS

## HFAL3

|  | Material Group<br>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<br>(mm)                 | fz<br>(mm/z) | fz<br>(mm/z) | fz<br>(mm/z) | fz<br>(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<br>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<br>(mm)                 | fz<br>(mm/z) | fz<br>(mm/z) | fz<br>(mm/z) | fz<br>(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<br>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<br>(mm)                 | fz<br>(mm/z) | fz<br>(mm/z) | fz<br>(mm/z) | fz<br>(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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