STOCK

125 JAHRE
R. STOCK & Co
WERKZEUGE SPIRALBOHRER
1887 2012

SuperV-Drills

High Performance Drills
The perfect solution

Chip – by Chip – to the Top

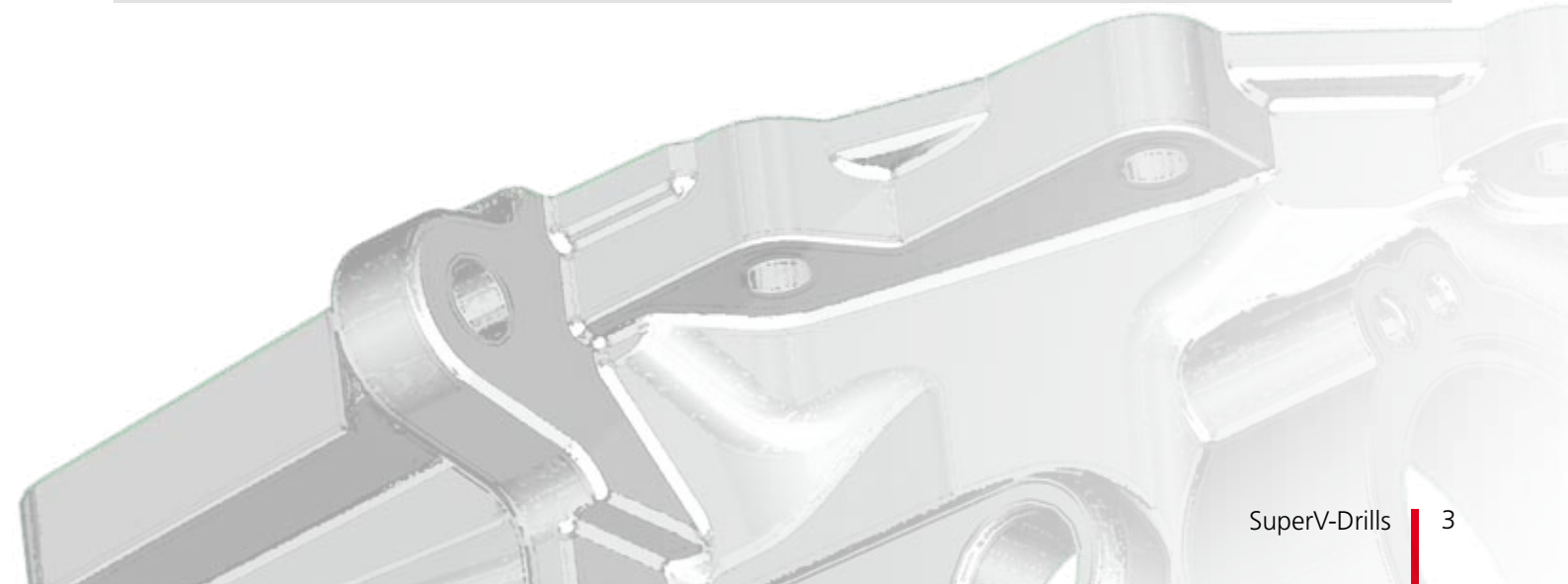
Stock SuperV-Drills

Content

Stock SuperV-Drills

Features

Type	Point angle	Point grinding	Tolerance	Internal coolant	Surface finish	Drilling depths	Shank
SuperV-U	140°	Facet point	m7	without/ with	TiAlN nano	3xD 5xD 7xD 12xD	cyl. HA HE
SuperV-VA	140°	Facet point	m7	with	AlTiN nano	3xD 5xD	HA HE
SuperV-S	140°	Relieved cone	m7	without/ with	TiAlSiN	3xD 5xD 7xD	HA HE
SuperV-F	140°	Relieved cone	m7	without/ with	TiN TiAlN	3xD 5xD	cyl. HE
SuperV-NX	135° 140°	Facet point	m7 h7	without/ with	AlTiN+	4xD 7xD 8xD 15xD	reinforced
SuperV-GR	-	Radius point	m7	with	TiAlN	5xD 7xD	HA
SuperV83G	150°	Facet point	h7	without	bright	5xD	cyl.
SuperV83GAL	130°	Spiropoint	m7	without	bright	5xD	HA
SuperV95-GG	120°	Facet point	m7	with	bright	4xD 7xD 10xD	HA
SuperV95-GN	120°	Relieved cone	m7	with	bright	15xD	HA
SuperV70	140°	Relieved cone	m7	without/ with	TiAlN	8xD 12xD	HA
SuperV-T	135°	Relieved cone	h7	with	AlTiN	15xD 20xD 25xD 30xD 40xD	HA
SuperV-AP	140° 145°	Facet point Relieved cone	m7 h7	with	bright TiAlN TiAlN nano AlTiN nano	1,5xD 3xD 5xD 7xD 10xD	HE



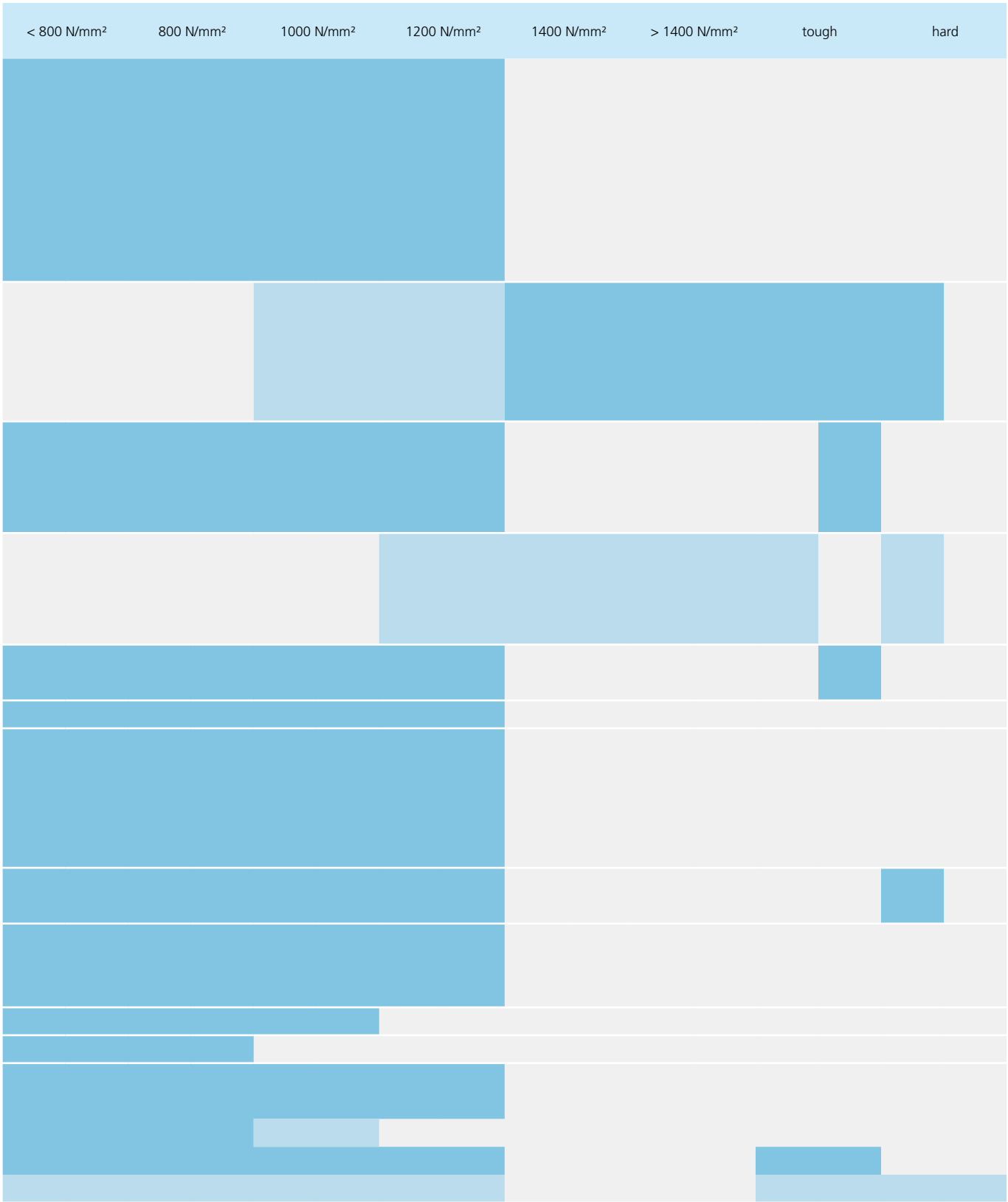
Application

by materials

Type	Catalogue no. w/o int.cool.	Catalogue no. int. coolant	Non-ferrous metals, Aluminium	Steels	Cast iron	Stainless and acid-resistant steels	Nickel, Ti-alloys	Hardened steels
SuperV-U	51873	51776	optimal	optimal	optimal			
	51871	51876	optimal	optimal	optimal			
	51787	51781	optimal	optimal	optimal			
	51887	51881	optimal	optimal	optimal			
		51789	optimal	optimal	optimal			
		51889	optimal	optimal	optimal			
		51893	optimal	optimal	optimal			
		61889	optimal	optimal	optimal			
SuperV-S	51750	51752		optimal	optimal	optimal	optimal	optimal
		51753		optimal	optimal	optimal	optimal	optimal
		51754		optimal	optimal	optimal	optimal	optimal
		51755		optimal	optimal	optimal	optimal	optimal
		51756		optimal	optimal	optimal	optimal	optimal
SuperV-VA		51770	optimal	optimal		optimal	well suited	
		51771	optimal	optimal		optimal	well suited	
		51772	optimal	optimal		optimal	well suited	
		51773	optimal	optimal		optimal	well suited	
SuperV-F	61888	61875	well suited	well suited	well suited	well suited	well suited	optimal
		51875	well suited	well suited	well suited	well suited	well suited	optimal
		61880	well suited	well suited	well suited	well suited	well suited	optimal
		51880	well suited	well suited	well suited	well suited	well suited	optimal
SuperV-NX	71998	51998	optimal	optimal	optimal	optimal	optimal	optimal
	71999	51999	optimal	optimal	optimal	optimal	optimal	optimal
SuperV70	51782	51783	optimal	optimal	optimal			
SuperV-T		51764		optimal	optimal	optimal	optimal	
		51765		optimal	optimal	optimal	optimal	
		51766		optimal	optimal	optimal	optimal	
		51767		optimal	optimal	optimal	optimal	
		51768		optimal	optimal	optimal	optimal	
SuperV-GR		51760	optimal		optimal			
		51761	optimal		optimal			
SuperV95-GG		71995	optimal		optimal			
		71994	optimal		optimal			
		71996	optimal		optimal			
SuperV95-GN		71997	optimal		optimal			
SuperV83-GAL	71862		optimal	optimal				
SuperV-AP		67011		optimal	well suited			
		57011			optimal			
		77012	optimal					
		67012	well suited	well suited	well suited	optimal	optimal	optimal
		77011	NC-indexable insert for centering and pilot holes					

optimal well suited

by tensile strength



SuperV-Drills

Type	Shank	Drilling depth	Tool material	Surface	Standard	d1 (mm)	Catalogue no.
SuperV-drills without internal coolant							
							
SuperV-F	cyl.	3xD	Solid carbide	TiN	DIN 6539	3.000 - 12.000	**61888**
							
SuperV-U	HA	3xD	Solid carbide	TiAlN nano	DIN 6537 K	3.000 - 20.000	**51873**
							
SuperV-U	HE	3xD	Solid carbide	TiAlN nano	DIN 6537 K	3.000 - 20.000	**51871**
							
SuperV-S	HA	3xD	Solid carbide	TiAlSiN	DIN 6537 K	3.000 - 20.000	**51750**
							
SuperV-U	HA	5xD	Solid carbide	TiAlN nano	DIN 6537 L	3.000 - 20.000	**51787**
							
SuperV-U	HE	5xD	Solid carbide	TiAlN nano	DIN 6537 L	3.000 - 20.000	**51887**
							
SuperV70-U	HA	8xD	Solid carbide	TiAlN	Stock std.	4.000 - 20.000	**51782**
SuperV-drills with internal coolant							
							
SuperV-IK-F	HE	3xD	Solid carbide	TiN	DIN 6537 K	4.000 - 22.000	**61875**
							
SuperV-IK-F	HE	3xD	Solid carbide	TiAlN nano	DIN 6537 K	5.000 - 16.000	**51875**
							
SuperV-IK-U	HA	3xD	Solid carbide	TiAlN nano	DIN 6537 K	3.000 - 20.000	**51776**
							
SuperV-IK-U	HE	3xD	Solid carbide	TiAlN nano	DIN 6537 K	3.000 - 20.000	**51876**
							
SuperV-IK-S	HA	3xD	Solid carbide	TiAlSiN	DIN 6537 K	3.000 - 20.000	**51752**

SuperV-Drills

Type	Shank	Drilling depth	Tool material	Surface	Standard	d1 (mm)	Catalogue no.
SuperV-drills with internal coolant							
							
SuperV-IK-S	HE	3xD	Solid carbide	TiAlSiN	DIN 6537 K	3.000 - 20.000	**51753**
							
SuperV-VA	HA	3xD	Solid carbide	AlTiN nano	DIN 6537 K	3.000 - 20.000	**51770**
							
SuperV-VA	HE	3xD	Solid carbide	AlTiN nano	DIN 6537 K	3.000 - 20.000	**51771**
							
SuperV90-U	HE	3xD	Carbide	TiN	DIN 6538 K	9.500 - 18.100	**61823**
							
SuperV95-GG	HA	4xD	Solid carbide	bright	Stock std.	3.000 - 20.000	**71995**
							
SuperV-IK-F	HE	5xD	Solid carbide	TiN	DIN 6537 L	4.000 - 25.000	**61880**
							
SuperV-IK-F	HE	5xD	Solid carbide	TiAlN nano	DIN 6537 L	5.000 - 18.000	**51880**
							
SuperV-IK-U	HA	5xD	Solid carbide	TiAlN nano	DIN 6537 L	3.000 - 20.000	**51781**
							
SuperV-IK-U	HE	5xD	Solid carbide	TiAlN nano	DIN 6537 L	3.000 - 20.000	**51881**
							
SuperV-GR	HA	5xD	Solid carbide	TiAlN	DIN 6537 L	3.000 - 20.000	**51760**
							
SuperV-IK-S	HA	5xD	Solid carbide	TiAlSiN	DIN 6537 L	3.000 - 20.000	**51754**
							
SuperV-IK-S	HE	5xD	Solid carbide	TiAlSiN	DIN 6537 L	3.000 - 20.000	**51755**
							
SuperV-VA	HA	5xD	Solid carbide	AlTiN nano	DIN 6537 L	3.000 - 20.000	**51772**

SuperV-Drills

Type	Shank	Drilling depth	Tool material	Surface	Standard	d1 (mm)	Catalogue no.
SuperV-drills with internal coolant							
							
SuperV-VA	HE	5xD	Solid carbide	AlTiN nano	DIN 6537 L	3.000 - 20.000	**51773**
							
SuperV90-U	HE	5xD	Carbide	TiN	DIN 6538 M	10.000 - 20.000	**61824**
							
SuperV-IK-U	HA	7xD	Solid carbide	TiN	Stock std.	5.000 - 20.000	**61889**
							
SuperV-IK-U	HA	7xD	Solid carbide	TiAlN nano	Stock std.	3.000 - 20.000	**51789**
							
SuperV-IK-U	HE	7xD	Solid carbide	TiAlN nano	Stock std.	3.000 - 20.000	**51889**
							
SuperV-IK-S	HA	7xD	Solid carbide	TiAlSiN	Stock std.	3.000 - 16.000	**51756**
							
SuperV-GR	HA	7xD	Solid carbide	TiAlN	Stock std.	4.000 - 20.000	**51761**
							
SuperV90-U	HE	7xD	Carbide	TiN	DIN 6538 L	9.600 - 17.000	**61825**
							
SuperV95-GG	HA	7xD	Solid carbide	bright	Stock std.	3.000 - 20.000	**71994**
							
SuperV95-GG	HA	10xD	Solid carbide	bright	Stock std.	3.000 - 20.000	**71996**
							
SuperV-IK-U	HA	12xD	Solid carbide	TiAlN nano	Stock std.	3.000 - 20.000	**51893**
							
SuperV95-GN	HA	15xD	Solid carbide	bright	Stock std.	5.000 - 14.000	**71997**
							
SuperV70-IK-U	HA	12xD	Solid carbide	TiAlN	Stock std.	4.000 - 20.000	**51783**

SuperV-Drills

Type	Shank	Drilling depth	Tool material	Surface	Standard	d1 (mm)	Catalogue no.
SuperV-drills with internal coolant							
							
SuperV-T	HA	15xD	Solid carbide	AlTiN-tipped	Stock std.	3.000 - 14.000	**51764**
							
SuperV-T	HA	20xD	Solid carbide	AlTiN-tipped	Stock std.	3.000 - 14.000	**51765**
							
SuperV-T	HA	25xD	Solid carbide	AlTiN-tipped	Stock std.	3.000 - 12.000	**51766**
							
SuperV-T	HA	30xD	Solid carbide	AlTiN-tipped	Stock std.	3.000 - 10.000	**51767**
							
SuperV-T	HA	40xD	Solid carbide	AlTiN-tipped	Stock std.	3.000 - 8.000	**51768**
SuperV-drills. 3-fluted							
							
SuperV83-GAL	HA	5xD	Solid carbide	bright	DIN 6537 L	3.000 - 20.000	**71862**
Micro precision drills SuperV-NX							
							
SuperV-NX	cyl.	4xD	Solid carbide	AlTiN+	Stock std.	0.500 - 3.000	**71998**
							
SuperV-NX	cyl.	7xD	Solid carbide	AlTiN+	Stock std.	0.500 - 3.000	**71999**
							
SuperV-IK-NX	cyl.	8xD	Solid carbide	AlTiN	Stock std.	1.400 - 3.000	**51998**
							
SuperV-IK-NX	cyl.	15xD	Solid carbide	AlTiN-tipped	Stock std.	1.400 - 3.000	**51999**

Drilling system SuperV-AP

Type	Shank	Drilling depth	Tool material	Surface	Standard	d1 (mm)	Catalogue no.
Drilling system SuperV type V-AP							
							
SuperV-AP	HE	1.5xD		nickel-plated	Stock std.	11.000 - 40.000	**77007**
							
SuperV-AP	HE	3xD		nickel-plated	Stock std.	11.000 - 40.000	**77000**
							
SuperV-AP	HE	5xD		nickel-plated	Stock std.	11.000 - 40.000	**77001**
							
SuperV-AP	HE	7xD		nickel-plated	Stock std.	11.000 - 40.000	**77003**
							
SuperV-AP	HE	10xD		nickel-plated	Stock std.	11.000 - 32.990	**77004**
Interchangeable inserts for SuperV-AP							
							
SuperV-AP GG			Solid carbide	TiAlN	Stock std.	11.000 - 40.000	**57011**
							
SuperV-AP U			Solid carbide	TiAlN nano	Stock std.	11.000 - 40.000	**67011**
							
SuperV-AP VA			Solid carbide	AlTiN nano	Stock std.	11.000 - 40.000	**67012**
							
SuperV-AP AL			Solid carbide	bright	Stock std.	11.000 - 40.000	**77012**
							
SuperV-AP NC			Solid carbide	AlTiN nano	Stock std.	11.000 - 40.000	**77011**

Carbide grades

Stock description	Co-content [M-%]	Tungsten carbide grain size [µm]	Hardness [HV]	ISO classification [ISO 513]	Characteristics
DK460UF	10	0.5	1620	K20-K40 coated: P, M20-M40, H, S, N25	A carbide grade with wide range of application possibilities. It is applied, mostly coated, for the machining of steel, soft Al alloys, cast iron as well as “super alloys” such as Inconel 718. This grade is the backbone of our carbide production.
DK500UF	12	0.5	1680	K25 coated: P, M, H, S, N25	The grade has been especially developed for hard machining. It possesses a higher hardness and deformation tolerance in comparison to DK460UF. Due to the high Co-content, a coated application is strongly recommended.
DK255F	8	0.7	1720	K20 coated: P, M, H, S, N20	The grade is recommended for hard machining, the machining of high tensile grey cast iron and hard AlSi-alloys. Dry machining is possible. A coated application is preferable.
DK120	6	1.3	1620	K15 coated: N15	The grade is especially suitable for the application with diamond coating.
DK120UF	7	0.5	1850	K05	Ultra fine grain type offering extreme wear resistance, suitable for absolutely rigid machines, preferred for reamers.
K55SF	9	0.2 -0.5	1920	K10-K30	For application with high wear resistant materials, stainless steels, composite materials such as Kevlar and GRP, high speed machining and dry machining.
DK400N	10	0.7	1580	K35M coated: P, M, S, N35M	An extremely tough grade for the machining of high heat resistant metals.

Coatings

	TiN-coating	AlTiN/AlTiN nano-coating	TiAlN/TiAlN nano-coating	TiAlSiN-coating
Process	PVD	PVD	PVD	PVD
Substrate	HSS, Carbide, Cermet	HSS, Carbide	HSS, Carbide, Cermet	Carbide
Layer (subcoating)	mono	mono	multi	multi
Color	gold	grey/violet	violet	red/bronze
Coefficient of friction	0.5	0.6	0.6	0.55
Hardness (HV 0,05)	2300	3400	3300	5500
Application temperature (°C)	< 600°	< 900°	< 800°	< 800°
Typical cutting operation	universal	universal	universal	universal
Preferred working materials	universal	difficult-to-machine materials such as Titan-alloys, GJV, Inconel and hardened steels	universal	high tensile strength steels, cast iron, special alloys, abrasive materials
Advantage	reasonable priced	hard-machining (> 52 HRC, only carbide), HSC-operations	wide range of applications	extrem high hardness of the coating

SuperV-drills

Application recommendations

Feed column

drill-Ø mm	Code-letter A	B	C	D	E	F	G	H	I
0.50	0.004	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.019
1.00	0.006	0.008	0.012	0.014	0.016	0.018	0.020	0.023	0.025
2.00	0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125
2.50	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160
3.15	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.160
4.00	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.200
5.00	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250
6.30	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315
8.00	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.315
10.00	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
12.50	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
16.00	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
20.00	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
25.00	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
31.50	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
40.00	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250

feed f (mm/rev)

Tools with feed column no. in **bold** are preferred choices for listed material group.

K, P, K/P
Since our new carbide grades are universally applicable we now define our carbide application groups as K or K/P only.

* use tools with large backtaper

Lubricants:
cutting oil, highly activated ■
soluble oil (emulsion) ■
without lubricant □
air only [!]

Material group	Materials examples, **new designations** (old designation in brackets) Figures in bold = material no. to DIN EN	Tensile strength MPa (N/mm²)	Hard-ness	Coolant
General purpose steels	**1.0035** S185(St33),**1.0486** P275N(StE285),**1.0345** P235GH(H1),**1.0425** P265GH(H2)	≤500		■
	1.0050 E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	>500-850		
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36)	≤850		■
	1.0727 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	850-1000		
Unalloyed tempering steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤ 700		
	1.0503 C45, **1.1191** C45E (Ck45)	700-850		■
	1.0601 C60, **1.1221** C60E (Ck60)	850-1000		
Alloyed tempering steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	850-≤1000		■
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	1000-1200		
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤750		■
Alloyed case hardened steels	**1.7043** 38Cr4	850-≤1000		■ ■
	1.5752 15NiCr13 (15NiCr13), **1.7131** 16MnCr5, **1.7264** 20CrMo5	1000-1200		
Nitriding steels	**1.8504** 34CrAl6	≥850-≤1000		■
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	>1000-1200		■ ■
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		■
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	>850-1000		■ ■
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≥650-1000		■
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤330 HB	■ ■
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9	≤850		
austenitic	**1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A)	≤850		■
martensitic	**1.4057** X20CrNi 17 2 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤850		
Hardened steels	–		≤40-48 HRC	■
			>48-60 HRC	
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Cast iron	**0.6010** EN-GJL-100(GG10), **0.6020** EN-GJL-200(GG20)	850-≤1000		■ □
	0.6025 EN-GJL-250(GG25), **0.6035** EN-GJL-350(GG35)	1000-1200		
Spheroidal graphit iron and	**0.7050** EN-GJS-500-7(GGG50), **0.8035** EN-GJMW-350-4(GTW35)		≤240 HB	■
maleable cast iron	**0.7070** EN-GJS-700-2(GGG70), **0.8170** EN-GJMB-700-2(GTS70)		<300 HB	
Chilled cast iron	–		≤350 HB	■
Ti and Ti-alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		■
	3.7154 TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	>850-1200		
Aluminium and Al-alloys	**3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1	≤400		■
Al wrought alloys	**3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5	≤450		■
Al cast alloys ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		■
> 10 % Si	**3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		
Magnesium alloys	**3.5200** MgMn2, **3.5812.05** G-MgAl8Zn1, **3.5612.05** G-MgAl6Zn1	≤450		[!]
Copper, low alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤400		■ ■
Brass, short-chipping	**2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2	≤600		■ ■
long-chipping	**2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5	≤600		
Bronze, short-chipping	**2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		■ ■
	2.0790 CuNi18Zn19Pb	>600-850		■
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		■
	2.0980 CuAl11Ni, **2.1247** CuBe2	>850-1000		
Duroplastics	Epoxidharz, Resopal, Pertinax, Moltopren		–	□
Thermoplastics	Plexiglas, Hostalen, Novodur, Makralon		–	■ □
New Cast iron GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35)			■ □
	EN-GJV400 (GGV40), **EN-GJV500** (GGV50), SiMo6			
New Cast iron ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000)	800-1000		■ □
	EN-GJS-1200-2 (ADI1200), **EN-GJS-1400-1** (ADI1400)	1200-1400		
Kevlar	Kevlar		–	□
Glass/carbon-concentr. plastics	GFK/CFK		–	

≤3×D Drilling depth

Catalogue no.	61823	61888	51873	51871	51750	61875	51875	51776	51876
Tool material	Carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Carbide grade	P	K/P	K/P	K/P	K/P	K/P	K/P	K/P	K/P
Surface	TiN	TiN	TiAlN nano	TiAlN nano	TiAlSiN	TiN	TiAlN nano	TiAlN nano	TiAlN nano
DIN/Form	6538K	6539	6537K	6537K	6537K	6537K	6537K	6537K	6537K
Type	V90-U	F	U	U	S	F	F	U	U
internal coolant	with	without	without	without	without	with	with	with	with









v_c m/min	Feed column no.	v_c m/min	Feed column no.	v_c m/min	Feed column no.		v_c m/min	Feed column no.	v_c m/min	Feed column no.	v_c m/min	Feed column no.		
95	F	100	F	130	**G**	**G**	130	**G**	110	F	145	G	**G**	**G**
80	E	85	E	110	**F**	**F**	110	**F**	90	E	120	F	**F**	**F**
95	G	110	G	145	**H**	**H**	145	**H**	130	G	170	H	**H**	**H**
75	F	85	F	110	**G**	**G**	110	**G**	110	G	145	H	**H**	**H**
80	F	90	F	120	**G**	**G**	120	**G**	100	G	130	H	**H**	**H**
75	F	85	F	110	**G**	**G**	110	**G**	95	F	125	G	**G**	**G**
70	F	80	F	105	**G**	**G**	105	**G**	90	F	120	G	**G**	**G**
75	F	80	F	105	**G**	**G**	105	**G**	90	F	120	G	**G**	**G**
60	E	75	E	100	**F**	**F**	100	**F**	80	F	105	G	**G**	**G**
90	G	100	G	130	**H**	**H**	130	**H**	110	G	145	H	**H**	**H**
75	F	90	F	120	**G**	**G**	120	**G**	90	F	120	G	**G**	**G**
60	E	65	D	85	**E**	**E**	85	**E**	65	D	85	E	**E**	**E**
75	F	75	**E**	100	F	F	100	**F**	85	**F**	110	**G**	G	G
60	E	70	**D**	90	E	E	90	**E**	80	**D**	105	**E**	E	E
45	E	50	**E**	65	F	F	65	**F**	60	**E**	80	**F**	F	F
35	E	40	**D**	55	E	E	55	**E**	50	**D**	65	**E**	E	E
40	D	40	**C**				55	**D**	45	**C**	60	**D**	D	D
		45	**B**	45	C	C	45	**C**	45	**B**	60	**C**	C	C
40	B	40	**C**	55	D	D			45	**D**	60	**E**	E	E
35	B	35	**C**	45	D	D			40	**D**	55	**E**	E	E
35	B	35	**B**	45	C	C			35	**D**	45	**E**	E	E
		35	**B**	45	C	C	45	**C**	40	**B**	55	**C**	C	C
		20	**A**	25	B	B	25	B	25	**A**	35	**B**	B	B
		20	**C**	25	D	D	25	**D**	25	**C**	35	**D**	D	D
150	G	160	G	210	**H**	**H**			160	H	210	I	**I**	**I**
110	G	120	G	155	**H**	**H**			120	H	160	I	**I**	**I**
110	G	120	G	155	**G**	**G**			100	H	140	I	**I**	**I**
90	F	95	G	125	**G**	**G**			95	G	130	H	**H**	**H**
		25	**B**	35	**C**	**C**			30	B	40	C	C	C
		30	**B**	40	D	D	40	C	35	**C**	45	**D**	D	D
		25	**B**	35	C	C	35	C	30	**B**	40	**C**	C	C
200	H	200	**H**	260	**I**	**I**			240	H	310	I	**I**	**I**
200	H	200	**H**	260	**I**	**I**			240	H	310	I	**I**	**I**
170	H	170	**H**	220	**H**	**H**			200	H	260	I	**I**	**I**
140	G	140	**G**	180	**H**	**H**			170	H	220	I	**I**	**I**
		200	G	260	**H**	**H**			230	G	280	H	**H**	**H**
		80	**F**	105	G	G			95	**F**	125	**G**	G	G
		210	**G**	270	H	H			250	**G**	325	**H**	H	H
		140	F	180	**G**	**G**			170	F	220	G	**G**	**G**
		80	E	105	**F**	**F**			95	F	125	G	**G**	**G**
		65	E	85	**F**	**F**			80	E	105	F	**F**	**F**
		60	D	80	**E**	**E**			70	E	90	F	**F**	**F**
		45	D	60	**E**	**E**			60	E	80	F	**F**	**F**

SuperV-drills

Application recommendations

Feed column

drill-Ø mm	Code-letter A	B	C	D	E	F	G	H	I
0.50	0.004	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.019
1.00	0.006	0.008	0.012	0.014	0.016	0.018	0.020	0.023	0.025
2.00	0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125
2.50	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160
3.15	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.160
4.00	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.200
5.00	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250
6.30	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315
8.00	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.315
10.00	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
12.50	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
16.00	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
20.00	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
25.00	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
31.50	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
40.00	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250

feed f (mm/rev)

Tools with feed column no. in **bold** are preferred choices for listed material group.

K, P, K/P
Since our new carbide grades are universally applicable we now define our carbide application groups as K or K/P only.

* use tools with large backtaper

Lubricants:
cutting oil, highly activated ■
soluble oil (emulsion) ■
without lubricant □
air only [!]

Material group	Materials examples, **new designations** (old designation in brackets) Figures in bold = material no. to DIN EN	Tensile strength MPa (N/mm²)	Hard-ness	Coolant
General purpose steels	**1.0035** S185(St33),**1.0486** P275N(StE285),**1.0345** P235GH(H1),**1.0425** P265GH(H2)	≤500		■
	1.0050 E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	>500-850		
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36)	≤850		■
	1.0727 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	850-1000		
Unalloyed tempering steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤ 700		
	1.0503 C45, **1.1191** C45E (Ck45)	700-850		■
	1.0601 C60, **1.1221** C60E (Ck60)	850-1000		
Alloyed tempering steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	850-≤1000		■
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	1000-1200		
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤750		■
Alloyed case hardened steels	**1.7043** 38Cr4	850-≤1000		■ ■
	1.5752 15NiCr13 (15NiCr13), **1.7131** 16MnCr5, **1.7264** 20CrMo5	1000-1200		
Nitriding steels	**1.8504** 34CrAl6	≥850-≤1000		■
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	>1000-1200		■ ■
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		■
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	>850-1000		■ ■
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≥650-1000		■
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤330 HB	■ ■
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9	≤850		
austenitic	**1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A)	≤850		■
martensitic	**1.4057** X20CrNi 17 2 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤850		
Hardened steels	–		≤40-48 HRC	
			>48-60 HRC	■
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Cast iron	**0.6010** EN-GJL-100(GG10), **0.6020** EN-GJL-200(GG20)	850-≤1000		■ □
	0.6025 EN-GJL-250(GG25), **0.6035** EN-GJL-350(GG35)	1000-1200		
Spheroidal graphit iron and	**0.7050** EN-GJS-500-7(GGG50), **0.8035** EN-GJMW-350-4(GTW35)		≤240 HB	■
maleable cast iron	**0.7070** EN-GJS-700-2(GGG70), **0.8170** EN-GJMB-700-2(GTS70)		<300 HB	
Chilled cast iron	–		≤350 HB	■
Ti and Ti-alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		■
	3.7154 TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	>850-1200		
Aluminium and Al-alloys	**3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1	≤400		■
Al wrought alloys	**3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5	≤450		■
Al cast alloys ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		■
> 10 % Si	**3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		
Magnesium alloys	**3.5200** MgMn2, **3.5812.05** G-MgAl8Zn1, **3.5612.05** G-MgAl6Zn1	≤450		[!]
Copper, low alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤400		■ ■
Brass, short-chipping	**2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2	≤600		■ ■
long-chipping	**2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5	≤600		
Bronze, short-chipping	**2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		■ ■
	2.0790 CuNi18Zn19Pb	>600-850		■
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		■
	2.0980 CuAl11Ni, **2.1247** CuBe2	>850-1000		
Duroplastics	Epoxidharz, Resopal, Pertinax, Moltopren		–	□
Thermoplastics	Plexiglas, Hostalen, Novodur, Makralon		–	■ □
New Cast iron GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35)			■ □
	EN-GJV400 (GGV40), **EN-GJV500** (GGV50), SiMo6			
New Cast iron ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000)	800-1000		■ □
	EN-GJS-1200-2 (ADI1200), **EN-GJS-1400-1** (ADI1400)	1200-1400		
Kevlar	Kevlar		–	□
Glass/carbon-concentr. plastics	GFK/CFK		–	

≤3×D Drilling depth

Catalogue no.	51752	51753
Tool material	Solid carbide	Solid carbide
Carbide grade	K/P	K/P
Surface	TiAlSiN	TiAlSiN
DIN/Form	6537K	6537K
Type	S	S
internal coolant	with	with

v_c m/min	Feed column no.	
145	G	G
120	F	F
170	H	H
145	H	H
130	H	H
125	G	G
120	G	G
120	G	G
105	G	G
145	H	H
120	G	G
85	E	E
110	G	G
105	E	E
80	F	F
65	E	E
60	D	D
60	C	C
55	C	C
35	B	B
35	D	D
45	D	D
40	C	C

≤4×D

Catalogue no.	51770	51771
Tool material	Solid carbide	Solid carbide
Carbide grade	K/P	K/P
Surface	AlTiN nano	AlTiN nano
DIN/Form	6537K	6537K
Type	VA	VA
internal coolant	with	with

v_c m/min	Feed column no.	
80	E	E
60	B-C	B-C
80	E	E
30	B	B
35	B	B

Catalogue no.	71995
Tool material	Solid carbide
Carbide grade	K
Surface	bright
DIN/Form	WN
Type	V95-GG
internal coolant	with

v_c m/min	Feed column no.	
120	G	
100	G	
90	G	
80	G	
40	B	
410	I	
410	I	
380	I	
330	I	
280	I	
110	F	
80	E	

≤5×D Drilling depth

Catalogue no.	61824
Tool material	Carbide
Carbide grade	P
Surface	TiN
DIN/Form	6538M
Type	V90-U
internal coolant	with

v_c m/min	Feed column no.	
95	E	
80	D	
95	F	
75	E	
80	E	
75	E	
75	E	
75	E	
55	D	
90	F	
75	E	
55	D	
70	E	
55	D	
40	D	
35	D	
40	C	
40	B	
35	B	
35	B	
150	F	
110	F	
110	F	
90	E	
200	G	
200	G	
170	G	
140	F	

Catalogue no.	51887	51787
Tool material	Solid carbide	Solid carbide
Carbide grade	K/P	K/P
Surface	TiAlN nano	TiAlN nano
DIN/Form	6537L	6537L
Type	U	U
internal coolant	without	without

v_c m/min	Feed column no.	
130	G	G
110	F	F
145	H	H
110	G	G
120	G	G
110	G	G
105	G	G
105	G	G
100	F	F
130	H	H
120	G	G
85	E	E
100	F	F
90	E	E
65	F	F
55	E	E
45	C	C
55	D	D
45	D	D
45	C	C
45	C	C
25	B	B
25	D	D
210	H	H
155	H	H
145	G	G
125	G	G
35	C	C
40	D	D
35	C	C
260	I	I
260	I	I
235	I	I
170	H	H
260	H	H
105	G	G
270	H	H
180	G	G
105	F	F
85	F	F
80	E	E
60	E	E

Catalogue no.	61880
Tool material	Solid carbide
Carbide grade	K/P
Surface	TiN
DIN/Form	6537L
Type	F
internal coolant	with

v_c m/min	Feed column no.
110	F
90	E
130	G
110	G
100	G
95	F
90	F
80	F
110	G
90	F
65	D
50	D
45	C
45	B
45	D
40	D
35	D
40	B
25	A
25	C
160	H
120	H
100	H
95	G
30	B
35	C
30	B
240	H
240	H
200	H
170	H
230	G
95	F
250	G
170	F
95	F
80	E
70	E
60	E

SuperV-drills

Application recommendations

Feed column

drill-Ø mm	Code-letter A	B	C	D	E	F	G	H	I
0.50	0.004	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.019
1.00	0.006	0.008	0.012	0.014	0.016	0.018	0.020	0.023	0.025
2.00	0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125
2.50	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160
3.15	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.160
4.00	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.200
5.00	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250
6.30	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315
8.00	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.315
10.00	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
12.50	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
16.00	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
20.00	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
25.00	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
31.50	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
40.00	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250

feed f (mm/rev)

Tools with feed column no. in **bold** are preferred choices for listed material group.

K, P, K/P
Since our new carbide grades are universally applicable we now define our carbide application groups as K or K/P only.

* use tools with large backtaper

Lubricants:
cutting oil, highly activated ■
soluble oil (emulsion) ■
without lubricant □
air only [!]

Material group	Materials examples, **new designations** (old designation in brackets) Figures in bold = material no. to DIN EN	Tensile strength MPa (N/mm²)	Hard-ness	Coolant
General purpose steels	**1.0035** S185(St33),**1.0486** P275N(StE285),**1.0345** P235GH(H1),**1.0425** P265GH(H2)	≤500		■
	1.0050 E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	>500-850		
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36)	≤850		■
	1.0727 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	850-1000		
Unalloyed tempering steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤ 700		
	1.0503 C45, **1.1191** C45E (Ck45)	700-850		■
	1.0601 C60, **1.1221** C60E (Ck60)	850-1000		
Alloyed tempering steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	850-≤1000		■
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	1000-1200		
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤750		■
Alloyed case hardened steels	**1.7043** 38Cr4	850-≤1000		■ ■
	1.5752 15NiCr13 (15NiCr13), **1.7131** 16MnCr5, **1.7264** 20CrMo5	1000-1200		
Nitriding steels	**1.8504** 34CrAl6	≥850-≤1000		■
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	>1000-1200		■ ■
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		■
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	>850-1000		■ ■
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≥650-1000		■
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤330 HB	■ ■
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9	≤850		
austenitic	**1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A)	≤850		■
martensitic	**1.4057** X20CrNi 17 2 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤850		
Hardened steels	–		≤40-48 HRC	
			>48-60 HRC	■
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Cast iron	**0.6010** EN-GJL-100(GG10), **0.6020** EN-GJL-200(GG20)	850-≤1000		■ □
	0.6025 EN-GJL-250(GG25), **0.6035** EN-GJL-350(GG35)	1000-1200		
Spheroidal graphit iron and	**0.7050** EN-GJS-500-7(GGG50), **0.8035** EN-GJMW-350-4(GTW35)		≤240 HB	■
maleable cast iron	**0.7070** EN-GJS-700-2(GGG70), **0.8170** EN-GJMB-700-2(GTS70)		<300 HB	
Chilled cast iron	–		≤350 HB	■
Ti and Ti-alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		■
	3.7154 TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	>850-1200		
Aluminium and Al-alloys	**3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1	≤400		■
Al wrought alloys	**3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5	≤450		■
Al cast alloys ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		■
> 10 % Si	**3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		
Magnesium alloys	**3.5200** MgMn2, **3.5812.05** G-MgAl8Zn1, **3.5612.05** G-MgAl6Zn1	≤450		[!]
Copper, low alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤400		■ ■
Brass, short-chipping	**2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2	≤600		■ ■
long-chipping	**2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5	≤600		
Bronze, short-chipping	**2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		■ ■
	2.0790 CuNi18Zn19Pb	>600-850		■
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		■
	2.0980 CuAl11Ni, **2.1247** CuBe2	>850-1000		
Duroplastics	Epoxidharz, Resopal, Pertinax, Moltopren		–	□
Thermoplastics	Plexiglas, Hostalen, Novodur, Makralon		–	■ □
New Cast iron GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35)			■ □
	EN-GJV400 (GGV40), **EN-GJV500** (GGV50), SiMo6			
New Cast iron ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000)	800-1000		■ □
	EN-GJS-1200-2 (ADI1200), **EN-GJS-1400-1** (ADI1400)	1200-1400		
Kevlar	Kevlar		–	□
Glass/carbon-concentr. plastics	GFK/CFK		–	

≤5×D Drilling depth

Catalogue no.	51880	51781	51881	51754	51755	51772	51773	51760	71862
Tool material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Carbide grade	K/P	K/P	K/P	K/P	K/P	K/P	K/P	K/P	K
Surface	TiAlN nano	TiAlN nano	TiAlN nano	TiAlSiN	TiAlSiN	AlTiN nano	AlTiN nano	TiAlN	bright
DIN/Form	6537L	6537L	6537L	6537L	6537L	6537L	6537L	6537L	6537L
Type	F	U	U	S	S	VA	VA	GR	V83-GAL
internal coolant	with	with	with	with	with	with	with	with	without





v_c m/min	Feed column no.			v_c m/min	Feed column no.		v_c m/min	Feed column no.		v_c m/min	Feed column no.	v_c m/min	Feed column no.
145	G	**G**	**G**	145	G	**G**							
120	F	**F**	**F**	120	**F**	**F**							
170	H	**H**	**H**	170	H	**H**							
145	H	**H**	**H**	145	**H**	**H**							
130	H	**H**	**H**	130	H	**H**							
125	G	**G**	**G**	125	G	**G**							
120	G	**G**	**G**	120	**G**	**G**							
120	G	**G**	**G**	120	**G**	**G**							
105	G	**G**	**G**	105	**G**	**G**							
145	H	**H**	**H**	145	H	**H**							
120	G	**G**	**G**	120	**G**	**G**							
85	E	**E**	**E**	85	**E**	**E**							
105	**G**	G	G	110	**G**	**G**							
100	**E**	E	E	105	**E**	**E**							
70	**F**	F	F	80	**F**	**F**							
55	**E**	E	E	65	**E**	**E**							
60	**D**	E	E	60	**D**	**D**							
60	**C**	C	C	60	**C**	**C**							
60	**E**	E	E				80	**E**	**E**				
55	**E**	E	E				60	**B-C**	**B-C**				
50	**E**	E	E				80	**E**	**E**				
55	**C**	C	C	55	**C**	**C**							
35	**B**	B	B	35	B	B							
35	**D**	D	D	35	**D**	**D**	30	B	B				
195	I	**I**	**I**							210	**I**	100	**F**
160	I	**I**	**I**							160	**I**	80	**F**
140	I	**I**	**I**							160	**I**	80	**F**
130	H	**H**	**H**							130	**H**	70	**F**
40	C	C	C										
45	**D**	D	D	45	D	D	35	B	B				
40	**C**	C	C	40	C	C							
310	I	**I**	**I**									180	**G**
310	I	**I**	**I**									160	**G**
260	I	**I**	**I**									150	**G**
220	I	**I**	**I**									120	**F**
280	H	**H**	**H**									180	**F**
125	**G**	G	G										
325	**H**	H	H									180	**F**
220	G	**G**	**G**										
125	G	**G**	**G**										
105	F	**F**	**F**										
90	F	**F**	**F**										
80	F	**F**	**F**										
										130	**H**		
										100	**H**		
										80	**H**		
										60	**H**		

SuperV-drills

Application recommendations

Feed column

drill-Ø mm	Code-letter A	B	C	D	E	F	G	H	I
0.50	0.004	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.019
1.00	0.006	0.008	0.012	0.014	0.016	0.018	0.020	0.023	0.025
2.00	0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125
2.50	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160
3.15	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.160
4.00	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.200
5.00	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250
6.30	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315
8.00	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.315
10.00	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
12.50	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
16.00	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
20.00	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
25.00	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
31.50	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
40.00	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250

feed f (mm/rev)

Tools with feed column no. in **bold** are preferred choices for listed material group.

K, P, K/P
Since our new carbide grades are universally applicable we now define our carbide application groups as K or K/P only.

* use tools with large backtaper

Lubricants:
cutting oil, highly activated ■
soluble oil (emulsion) ■
without lubricant □
air only [!]

Material group	Materials examples, **new designations** (old designation in brackets) Figures in bold = material no. to DIN EN	Tensile strength MPa (N/mm²)	Hard-ness	Coolant
General purpose steels	**1.0035** S185(St33),**1.0486** P275N(StE285),**1.0345** P235GH(H1),**1.0425** P265GH(H2)	≤500		■
	1.0050 E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	>500-850		
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36)	≤850		■
	1.0727 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	850-1000		
Unalloyed tempering steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤ 700		
	1.0503 C45, **1.1191** C45E (Ck45)	700-850		■
	1.0601 C60, **1.1221** C60E (Ck60)	850-1000		
Alloyed tempering steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	850-≤1000		■
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	1000-1200		
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤750		■
Alloyed case hardened steels	**1.7043** 38Cr4	850-≤1000		■ ■
	1.5752 15NiCr13 (15NiCr13), **1.7131** 16MnCr5, **1.7264** 20CrMo5	1000-1200		
Nitriding steels	**1.8504** 34CrAl6	≥850-≤1000		■
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	>1000-1200		■ ■
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		■
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	>850-1000		■ ■
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≥650-1000		■
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤330 HB	■ ■
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9	≤850		
austenitic	**1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A)	≤850		■
martensitic	**1.4057** X20CrNi 17 2 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤850		
Hardened steels	–		≤40-48 HRC	
			>48-60 HRC	■
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Cast iron	**0.6010** EN-GJL-100(GG10), **0.6020** EN-GJL-200(GG20)	850-≤1000		■ □
	0.6025 EN-GJL-250(GG25), **0.6035** EN-GJL-350(GG35)	1000-1200		
Spheroidal graphit iron and	**0.7050** EN-GJS-500-7(GGG50), **0.8035** EN-GJMW-350-4(GTW35)		≤240 HB	■
maleable cast iron	**0.7070** EN-GJS-700-2(GGG70), **0.8170** EN-GJMB-700-2(GTS70)		<300 HB	
Chilled cast iron	–		≤350 HB	■
Ti and Ti-alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		■
	3.7154 TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	>850-1200		
Aluminium and Al-alloys	**3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1	≤400		■
Al wrought alloys	**3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5	≤450		■
Al cast alloys ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		■
> 10 % Si	**3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		
Magnesium alloys	**3.5200** MgMn2, **3.5812.05** G-MgAl8Zn1, **3.5612.05** G-MgAl6Zn1	≤450		[!]
Copper, low alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤400		■ ■
Brass, short-chipping	**2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2	≤600		■ ■
long-chipping	**2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5	≤600		
Bronze, short-chipping	**2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		■ ■
	2.0790 CuNi18Zn19Pb	>600-850		■
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		■
	2.0980 CuAl11Ni, **2.1247** CuBe2	>850-1000		
Duroplastics	Epoxidharz, Resopal, Pertinax, Moltopren		–	□
Thermoplastics	Plexiglas, Hostalen, Novodur, Makralon		–	■ □
New Cast iron GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35)			■ □
	EN-GJV400 (GGV40), **EN-GJV500** (GGV50), SiMo6			
New Cast iron ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000)	800-1000		■ □
	EN-GJS-1200-2 (ADI1200), **EN-GJS-1400-1** (ADI1400)	1200-1400		
Kevlar	Kevlar		–	□
Glass/carbon-concentr. plastics	GFK/CFK		–	

≤7×D Drilling depth

≤8×D ≤10×D

Catalogue no.	61825	61889	51789	51889	51756	51761	71994	51782	71996
Tool material	Carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Carbide grade	P	K/P	K/P	K/P	K/P	K/P	K	K	K
Surface	TiN	TiN	TiAlN nano		TiAlSiN	TiAlN	bright	TiAlN	bright
DIN/Form	6538L	WN	WN	WN	WN	WN	WN	WN	WN
Type	V90-U	U	U	U	S	GR	V95-GG	V70	V95-GG
internal coolant	with	with	with	with	with	with	with	without	with









v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed column no.		v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.
95	D	110	**E**	145	**F**	**F**	145	**F**					100	**E**		
75	C	90	**D**	120	**E**	**E**	120	**E**					85	**D**		
90	E	130	**F**	170	**G**	**G**	170	**G**					110	**F**		
75	D	110	**F**	145	**G**	**G**	145	**G**					85	**F**		
80	D	100	**F**	130	**G**	**G**	130	**G**					90	**F**		
75	D	95	**E**	125	**F**	**F**	125	**F**					85	**E**		
60	D	90	**E**	120	**F**	**F**	120	**F**					80	**E**		
75	D	90	**E**	120	**F**	**F**	120	**F**					80	**E**		
60	C	80	**E**	105	**F**	**F**	105	**F**					75	**E**		
90	E	110	**F**	145	**G**	**G**	145	**G**					100	**F**		
75	D	90	**E**	120	**F**	**F**	120	**F**					85	**E**		
55	C	65	**C**	85	**D**	**D**	85	**D**					60	**C**		
75	D	80	E	110	F	F	110	**F**					75	**E**		
55	C	75	D	105	D	D	105	**D**					70	**D**		
40	C	55	D	80	E	E	80	**E**					50	**D**		
35	C	40	C	65	D	D	65	**D**					35	**C**		
40	B	45	B	60	D	D	60	**C**					40	**B**		
		45	A	60	B	B	60	**B**					40	A		
35	A	45	C	60	D	D							40	C		
33	A	40	C	55	D	D							40	C		
25	A	35	C	45	D	D							30	C		
		40	A	55	B	B	55	**B**					35	A		
		25	A	35	A	A	35	A					20	A		
		25	B	35	C	C	35	**C**					20	B		
150	E	150	**G**	195	**H**	**H**			210	**H**	120	F	130	**G**	120	F
110	E	120	**G**	160	**H**	**H**			160	**H**	100	F	110	**G**	100	F
110	E	100	**G**	140	**H**	**H**			160	**H**	90	F			90	F
90	D	95	**F**	130	**G**	**G**			130	**G**	80	F			80	F
		30	**A**	40	B	B					40	B			40	A
		35	A	40	C	C	45	C								
		30	A	40	B	B	40	D					90	**G**		
180	F	240	G	310	**H**	**H**					410	H	85	**F**	410	H
180	F	240	G	310	**H**	**H**					410	H	25	**A**	410	H
160	F	200	G	260	**H**	**H**					380	**H**	30	**A**	380	**H**
130	E	170	G	220	**H**	**H**					330	**H**			330	**H**
		230	**F**	280	**G**	**G**							220	**G**		
		95	F	125	F	F							220	**G**		
		250	G	325	G	G					280	G	180	**G**	280	G
		170	**F**	220	F	F							150	**G**		
		95	**F**	125	**F**	**F**					110	F	210	**F**	110	F
		80	**E**	105	**E**	**E**					80	E	85	**F**	80	E
		70	**E**	90	**E**	**E**							220	**G**		
		60	**E**	80	**E**	**E**							150	**F**		
									130	**G**						
									100	**G**						
									80	**G**						
									60	**G**						

SuperV-drills
Application recommendations

Feed column

drill-Ø mm	Code-letter A	B	C	D	E	F	G	H	I
0.50	0.004	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.019
1.00	0.006	0.008	0.012	0.014	0.016	0.018	0.020	0.023	0.025
2.00	0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125
2.50	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160
3.15	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.160
4.00	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.200
5.00	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250
6.30	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315
8.00	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.315
10.00	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
12.50	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
16.00	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
20.00	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
25.00	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
31.50	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
40.00	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250

feed f (mm/rev)

Tools with feed column no. in **bold** are preferred choices for listed material group.

K, P, K/P
Since our new carbide grades are universally applicable we now define our carbide application groups as K or K/P only.

* use tools with large backtaper

Application recommendations for SuperV-T-drills:
In order to achieve optimal machining results when producing deep holes, we recommend:
1. Production of a cylindrical pilot hole (tolerance F9) with a min. drilling depth of 1 x D with our Super drill type U or VA (140° point angle, tolerance m7). Or alternatively one Pilot Drill-Mill cat. no. 54700
2. Entry in the pilot hole: speed approx. 300 rev./min, feed rate approx. 500 mm/min.
3. Setting of coolant pressure and speed.
4. Continuous drilling to complete hole depth without wood pecking.
5. For through holes with plain - i.e. 90° - exit, reduce feed rate vf to 50 % approx. 1 mm prior to break-through.
6. For through holes with oblique exit, reduce the feed rate v_f to 40% approx. 1 mm prior to break-through.
7. After reaching hole depth stop machine spindle and coolant supply, withdrawal in top gear.

Lubricants:
cutting oil, highly activated ■
soluble oil (emulsion) ■
without lubricant □
air only [!]

Material group	Materials examples, **new designations** (old designation in brackets) Figures in bold = material no. to DIN EN	Tensile strength MPa (N/mm²)	Hard-ness	Coolant
General purpose steels	**1.0035** S185(St33),**1.0486** P275N(StE285),**1.0345** P235GH(H1),**1.0425** P265GH(H2)	≤500		■
	1.0050 E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	>500-850		
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36)	≤850		■
	1.0727 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	850-1000		
Unalloyed tempering steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤ 700		
	1.0503 C45, **1.1191** C45E (Ck45)	700-850		■
	1.0601 C60, **1.1221** C60E (Ck60)	850-1000		
Alloyed tempering steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	850-≤1000		■
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	1000-1200		
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤750		■
Alloyed case hardened steels	**1.7043** 38Cr4	850-≤1000		■ ■
	1.5752 15NiCr13 (15NiCr13), **1.7131** 16MnCr5, **1.7264** 20CrMo5	1000-1200		
Nitriding steels	**1.8504** 34CrAl6	≥850-≤1000		■
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	>1000-1200		■ ■
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		■
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	>850-1000		■ ■
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≥650-1000		■
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤330 HB	■ ■
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9	≤850		
austenitic	**1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A)	≤850		■
martensitic	**1.4057** X20CrNi 17 2 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤850		
Hardened steels	–		≤40-48 HRC	
			>48-60 HRC	■
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Cast iron	**0.6010** EN-GJL-100(GG10), **0.6020** EN-GJL-200(GG20)	850-≤1000		■ □
	0.6025 EN-GJL-250(GG25), **0.6035** EN-GJL-350(GG35)	1000-1200		
Spheroidal graphit iron and	**0.7050** EN-GJS-500-7(GGG50), **0.8035** EN-GJMW-350-4(GTW35)		≤240 HB	■
maleable cast iron	**0.7070** EN-GJS-700-2(GGG70), **0.8170** EN-GJMB-700-2(GTS70)		<300 HB	
Chilled cast iron	–		≤350 HB	■
Ti and Ti-alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		■
	3.7154 TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	>850-1200		
Aluminium and Al-alloys	**3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1	≤400		■
Al wrought alloys	**3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5	≤450		■
Al cast alloys ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		■
> 10 % Si	**3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		
Magnesium alloys	**3.5200** MgMn2, **3.5812.05** G-MgAl8Zn1, **3.5612.05** G-MgAl6Zn1	≤450		[!]
Copper, low alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤400		■ ■
Brass, short-chipping	**2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2	≤600		■ ■
long-chipping	**2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5	≤600		
Bronze, short-chipping	**2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		■ ■
	2.0790 CuNi18Zn19Pb	>600-850		■
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		■
	2.0980 CuAl11Ni, **2.1247** CuBe2	>850-1000		
Duroplastics	Epoxidharz, Resopal, Pertinax, Moltopren		–	□
Thermoplastics	Plexiglas, Hostalen, Novodur, Makralon		–	■ □
New Cast iron GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35)			■ □
	EN-GJV400 (GGV40), **EN-GJV500** (GGV50), SiMo6			
New Cast iron ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000)	800-1000		■ □
	EN-GJS-1200-2 (ADI1200), **EN-GJS-1400-1** (ADI1400)	1200-1400		
Kevlar	Kevlar		–	□
Glass/carbon-concentr. plastics	GFK/CFK		–	

≤12×D		≤15×D		≤15×D		≤20×D		≤25×D		≤30×D		≤40×D	
Catalogue no.	51893		51783		71997		51764		51765		51766		51767		51768
Tool material	Solid carbide		Solid carbide		Solid carbide		Solid carbide		Solid carbide		Solid carbide		Solid carbide		Solid carbide
Carbide grade	K/P		K		K		K/P		K/P		K/P		K/P		K/P
Surface	TiAlN nano		TiAlN		bright		AlTiN		AlTiN		AlTiN		AlTiN		AlTiN
DIN/Form	WN		WN		WN		WN		WN		WN		WN		WN
Type	U		V70		V95-GN		T		T		T		T		T
internal coolant	with		without		with		with		with		with		with		with








v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.
110	**H**	90	**F**			110	H	110	**H**	100	**H**	80	**G**	80	G
110	**H**	80	**E**			110	H	110	**H**	100	**H**	80	**G**	80	G
120	**H**	100	**G**			120	H	120	**H**	120	**H**	100	**H**	100	H
120	**H**	90	**G**			120	H	120	**H**	100	**H**	100	**H**	100	H
110	**F**	90	**G**			110	F	110	**F**	110	**F**	110	**F**	110	F
110	**H**	80	**F**			110	H	110	**H**	100	**H**	80	**G**	80	G
100	**G**	80	**F**			100	G	100	**G**	100	**G**	80	**G**	80	G
110	**G**	80	**F**			110	G	110	**G**	100	**G**	80	**G**	80	F-G
110	**F**	60	**F**			110	F	110	**F**	100	**F**	80	**F**	80	F
110	**H**	90	**G**			110	H	110	**H**	100	**H**	80	**G**	80	G
110	G	80	**F**			110	G	110	**G**	100	**G**	80	**F**	80	F
110	F	60	**D**			110	F	110	**F**	100	**F**	80	**F**	80	F
100	E	60	**F**			100	E	100	**E**	80	**E**	80	**E**	80	E
80	E	50	**D**			80	E	80	**E**	60	**E**	60	**E**	60	E
100	F	50	E			100	F-G	100	**F**	90	**F**	80	**F**	80	F-G
80	E	40	D			80	E	80	**E**	70	**D**	70	**D**	70	D
50	E	35	D			50	E	50	**E**	50	**D**	50	**D**	50	D
50	E	35	B			50	E	50	**E**	50	**D**	50	**D**	50	D
60	E	40	D			100	E	100	**E**	100	**E**	80	**E**	80	E
		40	D			70	B-C	60	**C**	60	**C**	60	**C**	70	B-C
		40	D			100	E	100	**E**	100	**E**	80	**E**	80	E
50	D					50	D	50	**D**	50	**D**	50	**D**	50	D
30	B					30	B	30	**B**	30	**B**	30	**B**	30	B
140	**H**	120	**H**	120	E	140	H	140	**H**	130	**H**	120	**H**	120	H
100	**H**	120	**H**	100	E	100	H	100	**H**	90	**H**	80	**H**	80	H
140	**H**	90	**H**	90	E	140	H	140	**H**	130	**H**	120	**H**	120	H
100	**D**	80	**G**	80	E	100	H	100	**H**	90	**H**	80	**H**	80	H
40	**B**			40	A										
250	F	150	**H**	410	F										
250	F	150	**H**	410	F										
220	G	150	**H**	380	**G**										
180	**G**	120	**H**	330	**G**										
		150	**G**												
120	A	80	**F**			120	A	120	**A**	120	**A**	120	**A**	120	A
120	**H**	120	**G**	280	F	120	H	120	**H**	110	**H**	100	**H**	100	H
		120	**F**												
125	**F**	40	**F**	110	E										
125	**E**			80	D										
90	E														
80	E	40	**E**												
100	**F**					100	F	100	**F**	90	**F**	80	**F**	80	F
100	**F**					100	F	100	**F**	90	**F**	80	**F**	80	F
90	**D**					90	H	90	**H**	80	**H**	70	**H**	70	H

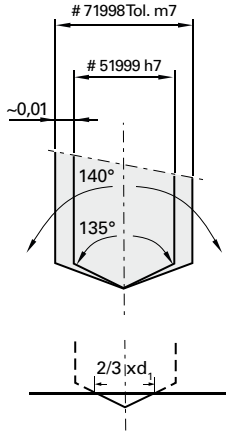
High performance micro precision drills SuperV-NX

Application recommendations

Feed column

drill-Ø mm	AA	BB	CC	DD	EE	FF	GG	HH	II	JJ	KK	LL	MM
0.50	0.006	0.012	0.018	0.022	0.030	0.035	0.040	0.045	0.050	0.050	0.055	0.060	0.060
0.80	0.008	0.016	0.024	0.032	0.040	0.050	0.060	0.070	0.080	0.080	0.080	0.090	0.090
1.00	0.012	0.022	0.032	0.042	0.060	0.070	0.080	0.090	0.100	0.100	0.110	0.110	0.120
1.50	0.021	0.036	0.051	0.066	0.090	0.100	0.120	0.130	0.150	0.150	0.160	0.170	0.180
2.00	0.032	0.052	0.072	0.092	0.120	0.140	0.160	0.180	0.200	0.210	0.220	0.230	0.240
2.50	0.045	0.070	0.095	0.120	0.150	0.170	0.200	0.220	0.250	0.260	0.270	0.280	0.300
3.00	0.060	0.090	0.120	0.150	0.180	0.210	0.240	0.270	0.300	0.310	0.330	0.340	0.360

feed f (mm/rev)



K, P, K/P Since our new carbide grades are universally applicable we now define our carbide application groups as K or K/P only.

Tools with feed column no. **in bold** are preferred choices for listed material group.

Security advices: For safety reasons it is very important, that a drill does not exceed a speed of n = 6 000 rev./min when not supported. The centrifugal forces could break these long tools before reaching the workpiece surface!

General hints: No play in spindle bearings, alignment accurate tool holders. We recommend the application of hydraulic chucks or shrink fit chucks. We recommend lubrication by soluble oil or neat oil, coolant pressure min. 40 bar.

Pilot drilling
For the application of solid carbide SuperV-NX-drills 15xD we recommend a pilot hole 1xD up to 2xD depth.
For this pilot hole, the solid carbide SuperV-NX-drill 4xD is optimally suitable. Its point angle and its diameter tolerance are adapted.

Centering
In order to achieve full performance with SuperV-NX-drills from 8xD drilling depth, we recommend centering.
The SuperV-NX-drills up to 4xD, Catalog no. 71998, can be applied for this purpose. The centering diameter should be approximately 2/3xD. Centering can alternatively be made with the NC-drill 142°, Catalog no. 71189.

Lubricants:
cutting oil, highly activated ■
soluble oil (emulsion) ■
without lubricant □
air only [!]

Material group	Materials examples, **new designations** (old designation in brackets) Figures in bold = material no. to DIN EN	Tensile strength MPa (N/mm²)	Hard-ness	Coolant
General purpose steels	**1.0035** S185(St33),**1.0486** P275N(StE285),**1.0345** P235GH(H1),**1.0425** P265GH(H2)	≤500		■
	1.0050 E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	>500-850		
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36)	≤850		■
	1.0727 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	850-1000		
Unalloyed tempering steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤ 700		
	1.0503 C45, **1.1191** C45E (Ck45)	700-850		■
	1.0601 C60, **1.1221** C60E (Ck60)	850-1000		
Alloyed tempering steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	850-≤1000		■
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	1000-1200		
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤750		■
Alloyed case hardened steels	**1.7043** 38Cr4	850-≤1000		■ ■
	1.5752 15NiCr13 (15NiCr13), **1.7131** 16MnCr5, **1.7264** 20CrMo5	1000-1200		
Nitriding steels	**1.8504** 34CrAl6	≥850-≤1000		■
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	>1000-1200		■ ■
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		■
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	>850-1000		■ ■
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≥650-1000		■
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤330 HB	■ ■
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9	≤850		
austenitic	**1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A)	≤850		■
martensitic	**1.4057** X20CrNi 17 2 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤850		
Hardened steels	–		≤40-48 HRC	
			>48-60 HRC	■
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Cast iron	**0.6010** EN-GJL-100(GG10), **0.6020** EN-GJL-200(GG20)	850-≤1000		■ □
	0.6025 EN-GJL-250(GG25), **0.6035** EN-GJL-350(GG35)	1000-1200		
New Cast iron GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35)			
	EN-GJV400 (GGV40), **EN-GJV500** (GGV50), SiMo6			
New Cast iron ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000)	800-1000		
	EN-GJS-1200-2 (ADI1200), **EN-GJS-1400-1** (ADI1400)	1200-1400		
Spheroidal graphit iron and	**0.7050** EN-GJS-500-7(GGG50), **0.8035** EN-GJMW-350-4(GTW35)		≤240 HB	■
maleable cast iron	**0.7070** EN-GJS-700-2(GGG70), **0.8170** EN-GJMB-700-2(GTS70)		<300 HB	
Chilled cast iron	–		≤350 HB	■
Ti and Ti-alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		■
	3.7154 TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	>850-1200		
Aluminium and Al-alloys	**3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1	≤400		■
Al wrought alloys	**3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5	≤450		■
Al cast alloys ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		
> 10 % Si	**3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		■
Magnesium alloys	**3.5200** MgMn2, **3.5812.05** G-MgAl8Zn1, **3.5612.05** G-MgAl6Zn1	≤450		[!]
Copper, low alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤400		■ ■
Brass, short-chipping	**2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2	≤600		■ ■
long-chipping	**2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5	≤600		
Bronze, short-chipping	**2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		■ ■
	2.0790 CuNi18Zn19Pb	>600-850		■
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		■
	2.0980 CuAl11Ni, **2.1247** CuBe2	>850-1000		

	≤4×D	≤7×D	≤8×D	≤15×D
Catalogue no.	**71998**	**71999**	**51998**	**51999**
Tool material	**Solid carbide**	**Solid carbide**	**Solid carbide**	**Solid carbide**
Carbide grade	K/P	K/P	K/P	K/P
Surface	AlTiN+	AlTiN+	AlTiN	AlTiN-tipped
DIN	Stock std.	Stock std.	Stock std.	Stock std.
Type	NX	NX	NX	NX
internal coolant	**without**	**without**	**with**	**with**

v_c m/min	Feed column no.	v_c m/min	Feed column no.	v_c m/min	Feed column no.	v_c m/min	Feed column no.
90-120	**II**	*90-120*	**GG**	*90-120*	**CC**	*90-120*	**CC**
90-110	**II**	*90-110*	**GG**	*90-110*	**CC**	*90-110*	**CC**
90-120	**II**	*90-120*	**GG**	*90-120*	**DD**	*90-120*	**DD**
80-100	**HH**	*80-100*	**FF**	*80-100*	**DD**	*80-100*	**DD**
80-110	**II**	*80-110*	**GG**	*80-110*	**CC**	*80-110*	**CC**
80-110	**II**	*80-110*	**GG**	*80-110*	**CC**	*80-110*	**CC**
80-100	**HH**	*80-100*	**FF**	*80-100*	**CC**	*80-100*	**CC**
80-100	**HH**	*80-100*	**FF**	*80-100*	**CC**	*80-100*	**CC**
60-80	**GG**	*60-80*	**EE**	*60-80*	**CC**	*60-80*	**CC**
90-110	**HH**	*90-110*	**FF**	*90-110*	**BB**	*90-110*	**BB**
70-100	**HH**	*70-100*	**FF**	*70-100*	**CC**	*70-100*	**CC**
60-80	**GG**	*60-80*	**EE**	*60-80*	**CC**	*60-80*	**CC**
60-80	**GG**	*60-80*	**EE**	*60-80*	**BB**	*60-80*	**BB**
50-70	**GG**	*50-70*	**EE**	*50-70*	**BB**	*50-70*	**BB**
40-60	**GG**	*40-60*	**EE**	*40-60*	**CC**	*40-60*	**CC**
40-60	**GG**	*40-60*	**EE**	*40-60*	**CC**	*40-60*	**CC**
40-60	**BB**	*40-60*	**BB**	*40-60*	**BB**	*40-60*	**BB**
40-60	BB	*40-60*	BB	*40-60*	BB	*40-60*	BB
30	**BB**	*30*	**BB**	*60-80*	**BB**	*60-80*	**BB**
15	**AA**	*15*	**AA**	*60*	**AA**	*60*	**AA**
30	**BB**	*30*	**BB**	*60-80*	**BB**	*60-80*	**BB**
10	AA	*10*	AA	*25*	AA	*25*	AA
<150	**MM**	*<150*	**KK**	*<150*	**EE**	*<150*	**EE**
<140	**MM**	*<140*	**KK**	*<140*	**EE**	*<140*	**EE**
<140	**MM**	*<140*	**KK**	*<140*	**EE**	*<140*	**EE**
<130	**LL**	*<130*	**JJ**	*<130*	**EE**	*<130*	**EE**
15	AA	*15*	AA	*35*	AA	*35*	AA
15	AA	*15*	AA	*35*	AA	*35*	AA
60-80	MM	*60-80*	LL	*60-80*	MM	*60-80*	MM
60-80	MM	*60-80*	LL	*60-80*	MM	*60-80*	MM
120-150	DD	*120-150*	DD	*120-150*	DD	*120-150*	DD
120-150	DD	*120-150*	DD	*120-150*	DD	*120-150*	DD

SuperV-AP - Drilling system
Application recommendations

Feed column									
Code-letter	A	B	C	D	E	F	G	H	I
drill-Ø mm	feed f (mm/rev)								
10.00	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
12.50	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
16.00	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
20.00	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
25.00	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
31.50	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
40.00	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250

Please notice the application recomendations on page 35!

K, P, K/P Since our new carbide grades are universally applicable we now define our carbide application groups as K or K/P only.

Lubricants:
cutting oil, highly activated ■
soluble oil (emulsion) ■
without lubricant □
air only ⚠

Material group	Materials examples, **new designations** (old designation in brackets) Figures in bold = material no. to DIN EN	Tensile strength MPa (N/mm²)	Hard-ness	Coolant
General purpose steels	**1.0035** S185(St33),**1.0486** P275N(StE285),**1.0345** P235GH(H1),**1.0425** P265GH(H2) **1.0050** E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	≤500 >500-850		■
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36) **1.0727** 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	≤850 850-1000		■
Unalloyed tempering steels	**1.0402** C22, **1.1178** C30E (Ck30) **1.0503** C45, **1.1191** C45E (Ck45) **1.0601** C60, **1.1221** C60E (Ck60)	≤ 700 700-850 850-1000		 ■
Alloyed tempering steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4 **1.5710** 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	850-≤1000 1000-1200		■
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤750		■
Alloyed case hardened steels	**1.7043** 38Cr4 **1.5752** 15NiCr13 (15NiCr13), **1.7131** 16MnCr5, **1.7264** 20CrMo5	850-≤1000 1000-1200		■ ■
Nitriding steels	**1.8504** 34CrAl6 **1.8519** 31CrMoV9, **1.8550** 34CrAlNi7	≥850-≤1000 >1000-1200		■ ■ ■
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9 **1.2080** X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	≤850 >850-1000		■ ■ ■
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≥650-1000		■
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤330 HB	■ ■
Stainless steels, sulphured austenitic martensitic	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9 **1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A) **1.4057** X20CrNi 17 2 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤850 ≤850 ≤850		 ■
Hardened steels	–		≤40-48 HRC >48-60 HRC	■
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Cast iron	**0.6010** EN-GJL-100(GG10), **0.6020** EN-GJL-200(GG20) **0.6025** EN-GJL-250(GG25), **0.6035** EN-GJL-350(GG35)	850-≤1000 1000-1200		■ □
New Cast iron GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35) **EN-GJV400** (GGV40), **EN-GJV500** (GGV50), SiMo6			
New Cast iron ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000) **EN-GJS-1200-2** (ADI1200), **EN-GJS-1400-1** (ADI1400)	800-1000 1200-1400		
Spheroidal graphit iron and maleable cast iron Chilled cast iron	**0.7050** EN-GJS-500-7(GGG50), **0.8035** EN-GJMW-350-4(GTW35) **0.7070** EN-GJS-700-2(GGG70), **0.8170** EN-GJMB-700-2(GTS70) –		≤240 HB <300 HB ≤350 HB	■ ■
Ti and Ti-alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2 **3.7154** TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		 ■
Aluminium and Al-alloys	**3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1	≤400		■
Al wrought alloys	**3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5	≤450		■
Al cast alloys ≤ 10 % Si > 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9 **3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		 ■
Magnesium alloys	**3.5200** MgMn2, **3.5812.05** G-MgAl8Zn1, **3.5612.05** G-MgAl6Zn1	≤450		⚠
Copper, low alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤400		■ ■
Brass, short-chipping long-chipping	**2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2 **2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5	≤600 ≤600		■ ■ ■ ■
Bronze, short-chipping	**2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn **2.0790** CuNi18Zn19Pb	≤600 >600-850		■ ■ ■
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10 **2.0980** CuAl11Ni, **2.1247** CuBe2	≤850 >850-1000		■

Tool holders ≤ 1,5×D
Catalogue no. 77007

Catalogue no.	67011	67012	57011	77012	77011
Tool material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Carbide grade	K/P	K/P	K	K/P	K/P
Surface	TiAlN nano	AlTiN nano	TiAlN	bright	AlTiN nano
especially suitable for the machining of	steel	stainless steel	cast iron	Aluminium and Al-alloys	for piloting/chamfering





v_c m/min	Feed column no.	v_c m/min	Feed column no.	v_c m/min	Feed column no.	v_c m/min	Feed column no.	v_c m/min	Feed column no.
130	F							130	F
110	E							110	E
130	G							130	G
110	F							110	F
130	F							130	F
125	F							125	F
110	E							110	E
110	F							110	F
90	E							90	E
130	G							130	G
110	F							110	F
70	D							70	D
105	E							105	E
70	D							70	D
60	E							60	E
55	D							55	D
55	C							55	C
50	B							50	B
		55	C					55	C
		40	C					40	C
		35	C					35	C
		25	B					25	B
		25	B					25	B
				100	F			100	F
				90	F			90	F
				80	E			80	E
				80	E			80	E
				80	E			80	E
				80	E			80	E
				120	G			120	G
				100	F			100	F
		90	F					90	F
		40	C					40	C
		35	B					35	B
						200	G	200	G
						180	G	180	G
						150	G	150	G
						120	G	120	G
						180	G	180	G
						70	F	70	F
						180	G	180	G
						120	F	120	F
						70	F	70	F
						50	F	50	F
						45	F	45	F
						35	E	35	E

SuperV-AP - Drilling system

Application recommendations

Feed column

drill-Ø mm	Code-letter A	B	C	D	E	F	G	H	I
10.00	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
12.50	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
16.00	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
20.00	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
25.00	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
31.50	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
40.00	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250

feed f (mm/rev)

Please notice the application recomendations on page 35!

K, P, K/P Since our new carbide grades are universally applicable we now define our carbide application groups as K or K/P only.

Lubricants:
cutting oil, highly activated ■
soluble oil (emulsion) ■
without lubricant □
air only ⍁

Material group	Materials examples, **new designations** (old designation in brackets) Figures in bold = material no. to DIN EN	Tensile strength MPa (N/mm²)	Hard-ness	Coolant
General purpose steels	**1.0035** S185(St33),**1.0486** P275N(StE285),**1.0345** P235GH(H1),**1.0425** P265GH(H2) **1.0050** E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	≤500 >500-850		■
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36) **1.0727** 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	≤850 850-1000		■
Unalloyed tempering steels	**1.0402** C22, **1.1178** C30E (Ck30) **1.0503** C45, **1.1191** C45E (Ck45) **1.0601** C60, **1.1221** C60E (Ck60)	≤ 700 700-850 850-1000		■
Alloyed tempering steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4 **1.5710** 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	850-≤1000 1000-1200		■
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤750		■
Alloyed case hardened steels	**1.7043** 38Cr4 **1.5752** 15NiCr13 (15NiCr13), **1.7131** 16MnCr5, **1.7264** 20CrMo5	850-≤1000 1000-1200		■ ■
Nitriding steels	**1.8504** 34CrAl6 **1.8519** 31CrMoV9, **1.8550** 34CrAlNi7	≥850-≤1000 >1000-1200		■ ■ ■
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9 **1.2080** X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	≤850 >850-1000		■ ■ ■
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≥650-1000		■
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤330 HB	■ ■
Stainless steels, sulphured austenitic martensitic	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9 **1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A) **1.4057** X20CrNi 17 2 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤850 ≤850 ≤850		 ■
Hardened steels	–		≤40-48 HRC >48-60 HRC	 ■
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Cast iron	**0.6010** EN-GJL-100(GG10), **0.6020** EN-GJL-200(GG20) **0.6025** EN-GJL-250(GG25), **0.6035** EN-GJL-350(GG35)	850-≤1000 1000-1200		■ □
New Cast iron GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35) **EN-GJV400** (GGV40), **EN-GJV500** (GGV50), SiMo6			
New Cast iron ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000) **EN-GJS-1200-2** (ADI1200), **EN-GJS-1400-1** (ADI1400)	800-1000 1200-1400		
Spheroidal graphit iron and maleable cast iron	**0.7050** EN-GJS-500-7(GGG50), **0.8035** EN-GJMW-350-4(GTW35) **0.7070** EN-GJS-700-2(GGG70), **0.8170** EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	■
Chilled cast iron	–		≤350 HB	■
Ti and Ti-alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2 **3.7154** TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		■
Aluminium and Al-alloys	**3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1	≤400		■
Al wrought alloys	**3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5	≤450		■
Al cast alloys ≤ 10 % Si > 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9 **3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		■
Magnesium alloys	**3.5200** MgMn2, **3.5812.05** G-MgAl8Zn1, **3.5612.05** G-MgAl6Zn1	≤450		⍁
Copper, low alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤400		■ ■
Brass, short-chipping long-chipping	**2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2 **2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5	≤600 ≤600		■ ■
Bronze, short-chipping	**2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn **2.0790** CuNi18Zn19Pb	≤600 >600-850		■ ■ ■
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10 **2.0980** CuAl11Ni, **2.1247** CuBe2	≤850 >850-1000		■ ■

Tool holders ≤ 3×D
Catalogue no. 77000

Catalogue no.	67011	67012	57011	77012
Tool material	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Carbide grade	K/P	K/P	K/P	K
Surface	TiAlN nano	TiAlN nano	TiAlN	bright
especially suitable for the machining of	steel	stainless steel	cast iron	Aluminium and Al-alloys




v_c m/min	Feed column no.	v_c m/min	Feed column no.	v_c m/min	Feed column no.	v_c m/min	Feed column no.
130	**F**						
110	**E**						
130	**G**						
110	**F**						
130	**F**						
125	**F**						
110	**E**						
110	**F**						
90	**E**						
130	**G**						
110	**F**						
70	**D**						
105	**E**						
70	**D**						
60	**E**						
55	**D**						
55	**C**						
50	**B**						
		55	**C**				
		40	**C**				
		35	**C**				
		25	**B**				
		25	**B**				
				100	**F**		
				90	**F**		
				80	**E**		
				80	**E**		
				80	**E**		
				80	**E**		
				120	**G**		
				100	**F**		
		90	**F**				
		40	**C**				
		35	**B**				
						200	**G**
						180	**G**
						150	**G**
						120	**G**
						180	**G**
						70	**F**
						180	**G**
						120	**F**
						70	**F**
						50	**F**
						45	**F**
						35	**E**

SuperV-AP - Drilling system

Application recommendations

Feed column

drill-Ø mm	A	B	C	D	E	F	G	H	I
10.00	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
12.50	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
16.00	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
20.00	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
25.00	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
31.50	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
40.00	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250

feed f (mm/rev)

Please notice the application recomendations on page 35!

K, P, K/P Since our new carbide grades are universally applicable we now define our carbide application groups as K or K/P only.

Lubricants:
cutting oil, highly activated ■
soluble oil (emulsion) ■
without lubricant □
air only ⊡

Material group	Materials examples, **new designations** (old designation in brackets) Figures in bold = material no. to DIN EN	Tensile strength MPa (N/mm²)	Hard-ness	Coolant
General purpose steels	**1.0035** S185(St33),**1.0486** P275N(StE285),**1.0345** P235GH(H1),**1.0425** P265GH(H2) **1.0050** E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	≤500 >500-850		■
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36) **1.0727** 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	≤850 850-1000		■
Unalloyed tempering steels	**1.0402** C22, **1.1178** C30E (Ck30) **1.0503** C45, **1.1191** C45E (Ck45) **1.0601** C60, **1.1221** C60E (Ck60)	≤ 700 700-850 850-1000		■
Alloyed tempering steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4 **1.5710** 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	850-≤1000 1000-1200		■
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤750		■
Alloyed case hardened steels	**1.7043** 38Cr4 **1.5752** 15NiCr13 (15NiCr13), **1.7131** 16MnCr5, **1.7264** 20CrMo5	850-≤1000 1000-1200		■ ■
Nitriding steels	**1.8504** 34CrAl6 **1.8519** 31CrMoV9, **1.8550** 34CrAlNi7	≥850-≤1000 >1000-1200		■ ■ ■
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9 **1.2080** X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	≤850 >850-1000		■ ■ ■
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≥650-1000		■
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤330 HB	■ ■
Stainless steels, sulphured austenitic martensitic	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9 **1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A) **1.4057** X20CrNi 17 2 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤850 ≤850 ≤850		 ■
Hardened steels	–		≤40-48 HRC >48-60 HRC	■
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Cast iron	**0.6010** EN-GJL-100(GG10), **0.6020** EN-GJL-200(GG20) **0.6025** EN-GJL-250(GG25), **0.6035** EN-GJL-350(GG35)	850-≤1000 1000-1200		■ □
New Cast iron GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35) **EN-GJV400** (GGV40), **EN-GJV500** (GGV50), SiMo6			
New Cast iron ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000) **EN-GJS-1200-2** (ADI1200), **EN-GJS-1400-1** (ADI1400)	800-1000 1200-1400		
Spheroidal graphit iron and maleable cast iron	**0.7050** EN-GJS-500-7(GGG50), **0.8035** EN-GJMW-350-4(GTW35) **0.7070** EN-GJS-700-2(GGG70), **0.8170** EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	■
Chilled cast iron	–		≤350 HB	■
Ti and Ti-alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2 **3.7154** TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		■
Aluminium and Al-alloys	**3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1	≤400		■
Al wrought alloys	**3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5	≤450		■
Al cast alloys ≤ 10 % Si > 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9 **3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		■
Magnesium alloys	**3.5200** MgMn2, **3.5812.05** G-MgAl8Zn1, **3.5612.05** G-MgAl6Zn1	≤450		⊡
Copper, low alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤400		■ ■
Brass, short-chipping long-chipping	**2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2 **2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5	≤600 ≤600		■ ■
Bronze, short-chipping	**2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn **2.0790** CuNi18Zn19Pb	≤600 >600-850		■ ■ ■
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10 **2.0980** CuAl11Ni, **2.1247** CuBe2	≤850 >850-1000		■

Tool holders ≤ 5×D
Catalogue no. 77001

Catalogue no.	67011	67012	57011	77012
Tool material	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Carbide grade	K/P	K/P	K/P	K
Surface	TiAlN nano	TiAlN nano	TiAlN	bright
especially suitable for the machining of	steel	stainless steel	cast iron	Aluminium and Al-alloys




v_c m/min	Feed column no.	v_c m/min	Feed column no.	v_c m/min	Feed column no.	v_c m/min	Feed column no.
125	**F**						
105	**E**						
125	**G**						
105	**F**						
125	**F**						
120	**F**						
105	**E**						
105	**F**						
85	**E**						
125	**G**						
105	**F**						
70	**D**						
105	**E**						
70	**D**						
55	**E**						
50	**D**						
55	**C**						
50	**B**						
		55	**C**				
		40	**C**				
		35	**C**				
		25	**B**				
		25	**B**				
				100	**F**		
				90	**F**		
				80	**E**		
				80	**E**		
				80	**E**		
				80	**E**		
				120	**G**		
				100	**F**		
		90	**F**				
		40	**C**				
		35	**B**				
						180	**G**
						180	**G**
						140	**G**
						110	**G**
						180	**G**
						70	**F**
						180	**G**
						120	**F**
						70	**F**
						50	**F**
						45	**F**
						35	**E**

SuperV-AP - Drilling system

Application recommendations

Feed column

drill-Ø mm	Code-letter A	B	C	D	E	F	G	H	I
10.00	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
12.50	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
16.00	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
20.00	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
25.00	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
31.50	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
40.00	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250

feed f (mm/rev)

Please notice the application recomendations on page 35!

K, P, K/P Since our new carbide grades are universally applicable we now define our carbide application groups as K or K/P only.

Lubricants:
cutting oil, highly activated ■
soluble oil (emulsion) ■
without lubricant □
air only ⊡

Material group	Materials examples, **new designations** (old designation in brackets) Figures in bold = material no. to DIN EN	Tensile strength MPa (N/mm²)	Hard-ness	Coolant
General purpose steels	**1.0035** S185(St33),**1.0486** P275N(StE285),**1.0345** P235GH(H1),**1.0425** P265GH(H2) **1.0050** E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	≤500 >500-850		■
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36) **1.0727** 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	≤850 850-1000		■
Unalloyed tempering steels	**1.0402** C22, **1.1178** C30E (Ck30) **1.0503** C45, **1.1191** C45E (Ck45) **1.0601** C60, **1.1221** C60E (Ck60)	≤ 700 700-850 850-1000		■
Alloyed tempering steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4 **1.5710** 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	850-≤1000 1000-1200		■
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤750		■
Alloyed case hardened steels	**1.7043** 38Cr4 **1.5752** 15NiCr13 (15NiCr13), **1.7131** 16MnCr5, **1.7264** 20CrMo5	850-≤1000 1000-1200		■ ■
Nitriding steels	**1.8504** 34CrAl6 **1.8519** 31CrMoV9, **1.8550** 34CrAlNi7	≥850-≤1000 >1000-1200		■ ■ ■
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9 **1.2080** X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	≤850 >850-1000		■ ■ ■
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≥650-1000		■
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤330 HB	■ ■
Stainless steels, sulphured austenitic martensitic	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9 **1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A) **1.4057** X20CrNi 17 2 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤850 ≤850 ≤850		 ■
Hardened steels	–		≤40-48 HRC >48-60 HRC	 ■
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Cast iron	**0.6010** EN-GJL-100(GG10), **0.6020** EN-GJL-200(GG20) **0.6025** EN-GJL-250(GG25), **0.6035** EN-GJL-350(GG35)	850-≤1000 1000-1200		■ □
New Cast iron GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35) **EN-GJV400** (GGV40), **EN-GJV500** (GGV50), SiMo6			
New Cast iron ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000) **EN-GJS-1200-2** (ADI1200), **EN-GJS-1400-1** (ADI1400)	800-1000 1200-1400		
Spheroidal graphit iron and maleable cast iron	**0.7050** EN-GJS-500-7(GGG50), **0.8035** EN-GJMW-350-4(GTW35) **0.7070** EN-GJS-700-2(GGG70), **0.8170** EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	■
Chilled cast iron	–		≤350 HB	■
Ti and Ti-alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2 **3.7154** TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		■
Aluminium and Al-alloys	**3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1	≤400		■
Al wrought alloys	**3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5	≤450		■
Al cast alloys ≤ 10 % Si > 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9 **3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		■
Magnesium alloys	**3.5200** MgMn2, **3.5812.05** G-MgAl8Zn1, **3.5612.05** G-MgAl6Zn1	≤450		⊡
Copper, low alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤400		■ ■
Brass, short-chipping long-chipping	**2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2 **2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5	≤600 ≤600		■ ■
Bronze, short-chipping	**2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn **2.0790** CuNi18Zn19Pb	≤600 >600-850		■ ■ ■
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10 **2.0980** CuAl11Ni, **2.1247** CuBe2	≤850 >850-1000		■ ■

Tool holders ≤7×D
Catalogue no. 77003

Catalogue no.	67011	67012	57011	77012
Tool material	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Carbide grade	K/P	K/P	K/P	K
Surface	TiAlN nano	AlTiN nano	TiAlN	bright
especially suitable for the machining of	steel	stainless steel	cast iron	Aluminium and Al-alloys




v_c m/min	Feed column no.	v_c m/min	Feed column no.	v_c m/min	Feed column no.	v_c m/min	Feed column no.
120	**E**						
105	**D**						
120	**F**						
105	**E**						
120	**E**						
110	**E**						
100	**D**						
100	**E**						
85	**D**						
120	**F**						
100	**E**						
70	**D**						
105	**D**						
70	**C**						
55	**D**						
50	**C**						
55	**B**						
50	**B**						
		55	**B**				
		40	**B**				
		35	**B**				
		25	**A**				
		25	**A**				
				80	**F**		
				70	**F**		
				60	**E**		
				60	**E**		
				60	**E**		
				60	**E**		
				100	**G**		
				80	**F**		
		70	**F**				
		40	**B**				
		35	**A**				
						180	**F**
						180	**F**
						140	**F**
						110	**F**
						180	**F**
						70	**E**
						180	**F**
						120	**E**
						70	**E**
						50	**E**
						45	**E**
						35	**D**

SuperV-AP - Drilling system

Application recommendations

Feed column

drill-Ø mm	Code-letter A	B	C	D	E	F	G	H	I
10.00	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
12.50	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
16.00	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
20.00	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
25.00	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
31.50	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
40.00	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250

feed f (mm/rev)

Please notice the application recomendations on page 35!

K, P, K/P Since our new carbide grades are universally applicable we now define our carbide application groups as K or K/P only.

Lubricants:
cutting oil, highly activated ■
soluble oil (emulsion) ■
without lubricant □
air only ⊡

Material group	Materials examples, **new designations** (old designation in brackets) Figures in bold = material no. to DIN EN	Tensile strength MPa (N/mm²)	Hard-ness	Coolant
General purpose steels	**1.0035** S185(St33),**1.0486** P275N(StE285),**1.0345** P235GH(H1),**1.0425** P265GH(H2) **1.0050** E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	≤500 >500-850		■
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36) **1.0727** 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	≤850 850-1000		■
Unalloyed tempering steels	**1.0402** C22, **1.1178** C30E (Ck30) **1.0503** C45, **1.1191** C45E (Ck45) **1.0601** C60, **1.1221** C60E (Ck60)	≤ 700 700-850 850-1000		■
Alloyed tempering steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4 **1.5710** 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	850-≤1000 1000-1200		■
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤750		■
Alloyed case hardened steels	**1.7043** 38Cr4 **1.5752** 15NiCr13 (15NiCr13), **1.7131** 16MnCr5, **1.7264** 20CrMo5	850-≤1000 1000-1200		■ ■
Nitriding steels	**1.8504** 34CrAl6 **1.8519** 31CrMoV9, **1.8550** 34CrAlNi7	≥850-≤1000 >1000-1200		■ ■ ■
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9 **1.2080** X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	≤850 >850-1000		■ ■ ■
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≥650-1000		■
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤330 HB	■ ■
Stainless steels, sulphured austenitic martensitic	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9 **1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A) **1.4057** X20CrNi 17 2 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤850 ≤850 ≤850		 ■
Hardened steels	–		≤40-48 HRC >48-60 HRC	 ■
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Cast iron	**0.6010** EN-GJL-100(GG10), **0.6020** EN-GJL-200(GG20) **0.6025** EN-GJL-250(GG25), **0.6035** EN-GJL-350(GG35)	850-≤1000 1000-1200		■ □
New Cast iron GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35) **EN-GJV400** (GGV40), **EN-GJV500** (GGV50), SiMo6			
New Cast iron ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000) **EN-GJS-1200-2** (ADI1200), **EN-GJS-1400-1** (ADI1400)	800-1000 1200-1400		
Spheroidal graphit iron and maleable cast iron	**0.7050** EN-GJS-500-7(GGG50), **0.8035** EN-GJMW-350-4(GTW35) **0.7070** EN-GJS-700-2(GGG70), **0.8170** EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	■
Chilled cast iron	–		≤350 HB	■
Ti and Ti-alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2 **3.7154** TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		■
Aluminium and Al-alloys	**3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1	≤400		■
Al wrought alloys	**3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5	≤450		■
Al cast alloys ≤ 10 % Si > 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9 **3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		■
Magnesium alloys	**3.5200** MgMn2, **3.5812.05** G-MgAl8Zn1, **3.5612.05** G-MgAl6Zn1	≤450		⊡
Copper, low alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤400		■ ■
Brass, short-chipping long-chipping	**2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2 **2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5	≤600 ≤600		■ ■
Bronze, short-chipping	**2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn **2.0790** CuNi18Zn19Pb	≤600 >600-850		■ ■ ■
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10 **2.0980** CuAl11Ni, **2.1247** CuBe2	≤850 >850-1000		■ ■

Tool holders ≤ 10×D
Catalogue no. 77004

Catalogue no.	67011	67012	57011	77012
Tool material	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Carbide grade	K/P	K/P	K/P	K
Surface	TiAlN nano	AlTiN nano	TiAlN	bright
especially suitable for the machining of	steel	stainless steel	cast iron	Aluminium and Al-alloys

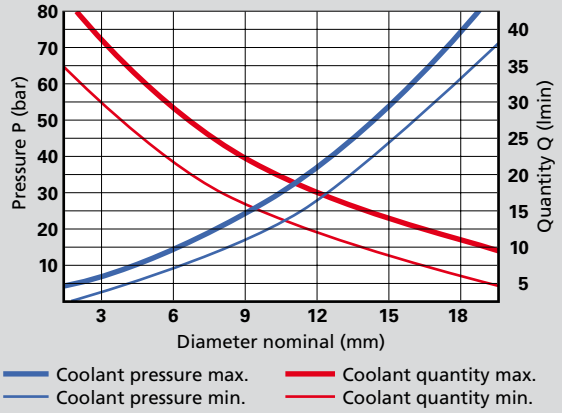



v_c m/min	Feed column no.	v_c m/min	Feed column no.	v_c m/min	Feed column no.	v_c m/min	Feed column no.
100	**E**						
95	**D**						
100	**F**						
95	**E**						
100	**E**						
95	**E**						
90	**D**						
90	**E**						
85	**D**						
100	**F**						
90	**E**						
70	**D**						
95	**D**						
70	**C**						
55	**D**						
50	**C**						
55	**B**						
50	**B**						
		55	**B**				
		40	**B**				
		35	**B**				
		25	**A**				
		25	**A**				
				80	**F**		
				70	**F**		
				60	**E**		
				60	**E**		
				60	**E**		
				60	**E**		
				100	**H**		
				80	**F**		
		70	**F**				
		40	**B**				
		35	**A**				
						150	**F**
						150	**F**
						130	**F**
						105	**F**
						150	**F**
						70	**E**
						150	**F**
						110	**E**
						70	**E**
						50	**E**
						45	**E**
						35	**D**

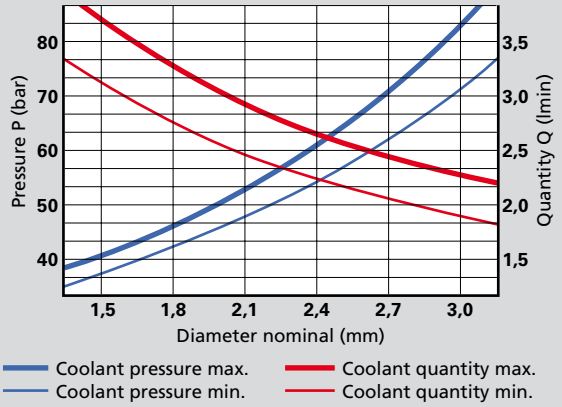
Stock SuperV-drills

Coolant recommendations

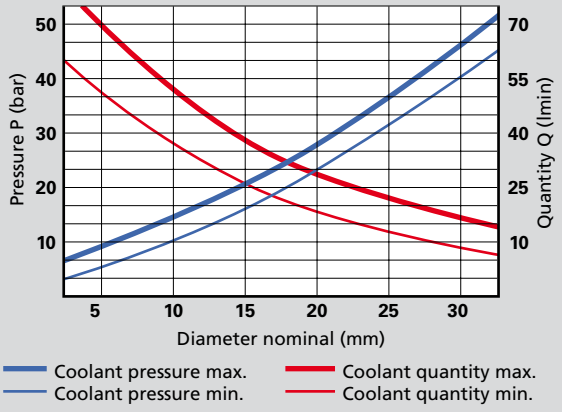
Coolant values SuperV-T
(Recommended values for soluble oil)



Coolant values Solid carbide micro-precision drills
15 x D (Recommended values for soluble oil)



Coolant values SuperV95-GG/GN
(Recommended values for soluble oil)



Stock SuperV-AP
Application

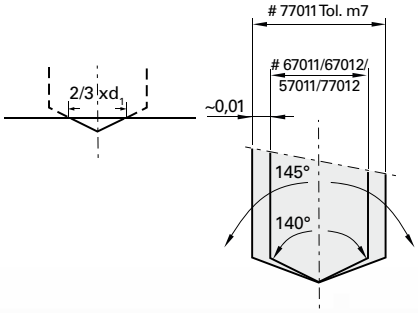
for all tool-holders

- For through holes supporting lands must remain in permanent contact.
- Don't apply drilling tool without trial for interrupted cutting (grooves, transverse holes). For interrupted cutting (max. 0.2 x D) it is recommended to reduce the feed rate whenever possible.
- In contrast to conventional indexable inserts, SuperV-AP tools are also suitable for the drilling of stacked sheets.
- On a lathe (stationary tool) it must be ensured that the tool is accurately centred.
- Pre-condition for optimal machining results is a sufficient cooling lubricant supply with soluble or neat oil.
- The tool is only of limited suitability for dry machining or MQL.

  Please contact our Application Engineers for further assistance.

Additional recommendations for tool-holders from 5×D

- **For drilling depths from 5xD we generally recommend centering or pilot drilling with holder, Catalogue-No. 77007 and pilot insert Catalogue-No. 77011.**
  Alternatively – depending on the material to be machined – SuperV-Drills Type U, GG or VA and the NC pre-drill Catalogue-No. 71189 can be applied.
- **for through holes supporting lands must remain in permanent contact. In addition, we recommend reducing the feed rate prior to exiting.**



Our Program

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- Chamfering Tools
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Your local contact:

R. Stock AG
Precision Cutting Tools
Lengeder Straße 29-35
13407 Berlin • Germany

Phone +49 30 40903-33 300
Fax +49 30 40903-33 324
eMail sales@stock.de

www.stock.de

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