

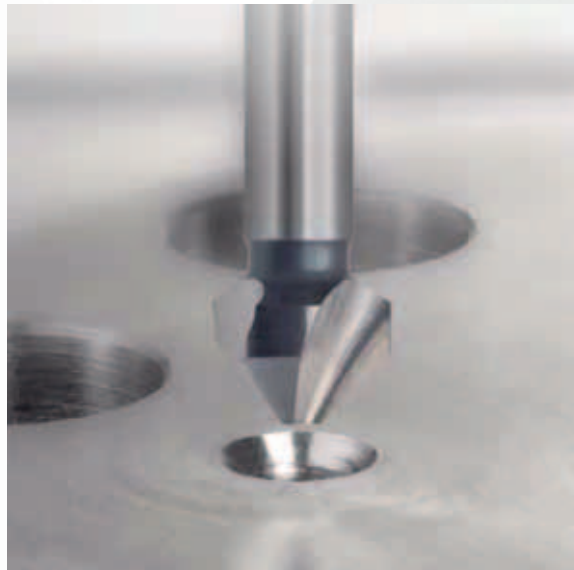


HARTNER

Precision Cutting Tools

COUNTERSINKS

MADE OF HSS AND HSCO



+ NEW: Countersinks with convex cutting edges

ISO code

P	Steel, high-alloyed steel
M	Stainless steel
K	Grey cast iron, spher. graphite iron/malleable cast iron
N	Aluminium and other non-ferrous metals
S	Special, super and titanium alloys
H	Hardened steel and chilled cast iron

Pictograms

Tool material



High speed steel

Surface



bright TiAlN

Standard



Point angle



Cutting direction



right

Shank form



cylindrical

Form





STANDARD HSS-COUNTERSINK

- ▼ BOX
- ▼ SINGLE TOOL

page 6

page 7



TWISTED COUNTERSINK

- ▼ BOX
- ▼ SINGLE TOOL

page 8

page 9

TECHNICAL PART

- ▼ APPLICATION RECOMMENDATIONS
- ▼ Ø TO ALLOW COUNTERSINKING

page 10

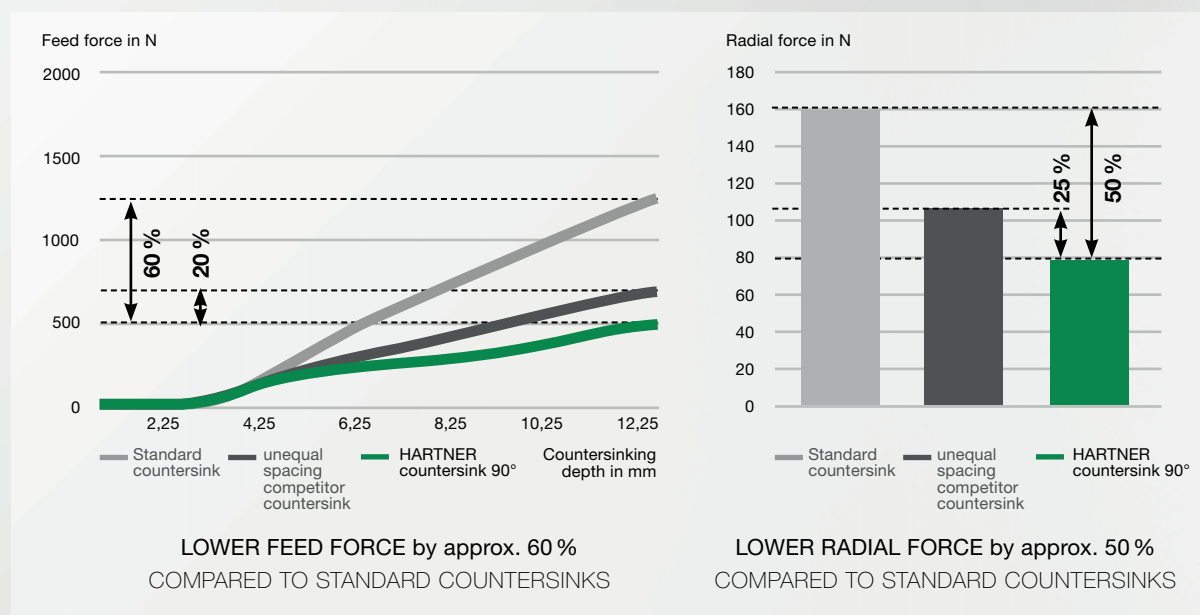
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THE NEW 90° TWISTED COUNTERSINK WITH CONVEX CUTTING EDGES

The axial and radial forces that occur during countersinking operations are strongly reduced due to the newly developed geometry of the cutting edges. Also with hand drills an easy and convenient countersinking is guaranteed.

Due to convex different radii of the cutting edges with variable helical pitch provide a stable and low-vibration countersinking process. Round, precise and chatter-free countersinking is guaranteed. The specially designed TiAlN coating ensures a higher wear resistance and high-temperature hardness which guarantee longer tool life for nearly all materials and applications.



Countersinking with standard countersink



Countersinking with twisted countersink



Three different convex cutting edges in combination with three unequal helix angles enable extremely stable and low-vibration cutting processes without any chatter marks.



- ▼ universal application in nearly any material
- ▼ round, precise and chatter-free countersinking
- ▼ reduction of feed force by 60 %
- ▼ reduction of radial force by 50 %

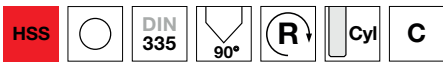


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90° Countersink sets

Article no. 88021

P	M	K	N	S	H
•	○	•	•	○	



set in case, consisting of item no. 88200 • radial relieved • three-fluted

Ø-range mm	Pieces/set	Code no.
6,3/8,3/10,4/12,4/16,5/20,5	6	7.000



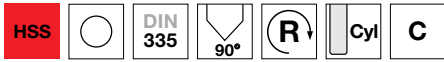
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90° Countersinks

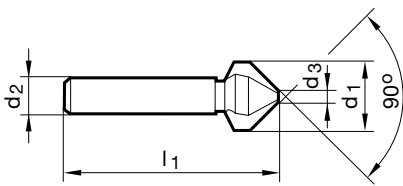
Article no. 88200



P	M	K	N	S	H
•	○	•	•	○	



radial relieved • three-fluted



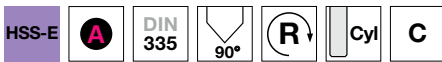
d1 mm	d2 mm	d3 mm	l1 mm	Z	Code no.
4.300	4.000	1.300	40.000	3	4.300
5.000	4.000	1.500	40.000	3	5.000
5.300	4.000	1.500	40.000	3	5.300
5.800	5.000	1.500	45.000	3	5.800
6.000	5.000	1.500	45.000	3	6.000
6.300	5.000	1.500	45.000	3	6.300
7.000	6.000	1.800	50.000	3	7.000
7.300	6.000	1.800	50.000	3	7.300
8.000	6.000	2.000	50.000	3	8.000
8.300	6.000	2.000	50.000	3	8.300
9.400	6.000	2.200	50.000	3	9.400
10.000	6.000	2.500	50.000	3	10.000
10.400	6.000	2.500	50.000	3	10.400
11.500	8.000	2.800	56.000	3	11.500
12.400	8.000	2.800	56.000	3	12.400
13.400	8.000	2.900	56.000	3	13.400
15.000	10.000	3.200	60.000	3	15.000
16.500	10.000	3.200	60.000	3	16.500
19.000	10.000	3.500	63.000	3	19.000
20.500	10.000	3.500	63.000	3	20.500
23.000	10.000	3.800	67.000	3	23.000
25.000	10.000	3.800	67.000	3	25.000
26.000	10.000	3.800	67.000	3	26.000
28.000	12.000	4.000	71.000	3	28.000
30.000	12.000	4.200	71.000	3	30.000
31.000	12.000	4.200	71.000	3	31.000



90° Countersink sets, spiral-fluted

Article no. 88022

P	M	K	N	S	H
•	•	•	○	○	



set in case, consisting of item no. 88201 • 3 different convex cutting edges • low-vibration cutting processes • for round and chatter-free countersinking • considerably lower feed force required • for universal application • smallest hole-Ø to allow countersinking see “Application recommendations for countersinks”

Ø-range mm	Pieces/set	Code no.
6,3/8,3/10,4/12,4/16,5/20,5	6	1.000

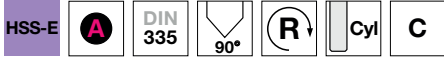


90° Countersinks, spiral-fluted

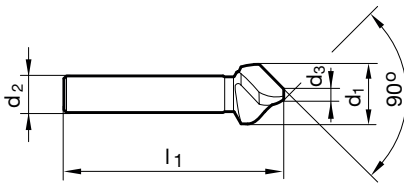
Article no. 88201



P	M	K	N	S	H
•	•	•	○	○	



3 different convex cutting edges • low-vibration cutting processes • for round and chatter-free countersinking • considerably lower feed force required • for universal application • smallest hole-Ø to allow countersinking see “Application recommendations for countersinks”



d1 mm	d2 mm	d3 mm	l1 mm	Z	Code no.
6.300	5.000	1.500	45.000	3	6.300
8.000	6.000	2.000	50.000	3	8.000
8.300	6.000	2.000	50.000	3	8.300
10.000	6.000	2.500	50.000	3	10.000
10.400	6.000	2.500	50.000	3	10.400
11.500	8.000	2.800	56.000	3	11.500
12.400	8.000	2.800	56.000	3	12.400
15.000	10.000	3.200	60.000	3	15.000
16.500	10.000	3.200	60.000	3	16.500
19.000	10.000	3.500	63.000	3	19.000
20.500	10.000	3.500	63.000	3	20.500
23.000	10.000	3.800	67.000	3	23.000
25.000	10.000	3.800	67.000	3	25.000
31.000	12.000	4.200	71.000	3	31.000



Application recommendations for countersinks

Article no.	
Standard/DIN	
Tool material	
Surface finish	
Countersink angle	
Shank form	

Important note for the use of twisted countersinks:

Smallest hole diameter to allow countersinking and suitable for countersunk screws for spiral-fluted countersinks

Tools with bold feed column no. are preferred choice.

Tool Ø mm	Feed column no.					
	81	82	83	84	85	86
	f (mm/rev.)					
2.00	0.03	0.04	0.06	0.08	0.10	0.13
2.50	0.03	0.05	0.07	0.10	0.13	0.16
3.15	0.03	0.05	0.08	0.11	0.15	0.20
4.00	0.04	0.06	0.09	0.13	0.17	0.22
5.00	0.04	0.07	0.10	0.14	0.18	0.23
6.30	0.04	0.07	0.12	0.15	0.19	0.24
8.00	0.05	0.08	0.13	0.16	0.20	0.25
10.00	0.06	0.09	0.14	0.17	0.22	0.26
12.50	0.06	0.10	0.15	0.19	0.23	0.28
16.00	0.07	0.11	0.17	0.21	0.26	0.31
20.00	0.08	0.13	0.18	0.23	0.28	0.33
25.00	0.09	0.15	0.21	0.26	0.30	0.38
31.50	0.12	0.17	0.24	0.30	0.36	0.42
40.00	0.14	0.21	0.28	0.34	0.40	0.46

d1	smallest hole-Ø to allow countersinking	for countersunk screws ISO 2009, 2010, 7046, 7047	for countersunk screws DIN 7991
6.30	2.00	-	M3
8.00	2.50	M4	-
8.30	2.50	-	M4
10.00	3.00	M5	-
10.40	3.00	-	M5
11.50	3.30	M6	-
12.40	3.30	-	M6
15.00	3.70	M8	-
16.50	3.70	-	M8
19.00	4.50	M10	-
20.50	4.50	-	M10
23.00	4.80	M12	-
25.00	4.80	-	M12
31.00	5.20	-	M16

Coolant:
 ○ Air
 ● Oil
 ● Soluble oil

Material group	Material examples Figures in bold = material no. to DIN EN 10 027	Tensile strength (N/mm ²)	Hardness	Coolant
Common structural 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)	≤1000		○
Free-cutting steels	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36)	≤850		○
	1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤1000		○
Unalloyed heat-treatable steels	1.0402 C22, 1.1178 C30E (Ck30)	≤700		○
	1.0503 C45, 1.1191 C45E (Ck45)	≤850		○
	1.0601 C60, 1.1221 C60E (Ck60)	≤1000		○
Alloyed heat-treatable steels	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4	≤1000		○
	1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1400		○
Unalloyed case hard. steels	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
Alloyed case hardened steels	1.7276 10CrMo11, 1.5125 11MnSi6	≤1000		●
	1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1400		●
Nitriding steels	1.8504 34CrAl6	≤1000		○
	1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1400		●
Tool steels	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9	≤850		○
	1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤1400		●
High speed steels	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
Spring steels	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
Hardened steels	-		≤48 HRC	●
			≤66 HRC	●
Stainless steels, sulphured	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤900		●
austenitic	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensitic	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
Cast iron	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20)		≤240 HB	○
	0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤350 HB	○
Spheroidal graphite iron	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMw-350-4 (GTW35)		≤240 HB	○
and malleable cast iron	0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤350 HB	○
Chilled cast iron	-		≤350 HB	○
New cast materials CGI	EN-GJV250 (CGI25), EN-GJV350 (CGI35)		≤220 HB	○
	EN-GJV400 (CGI40), EN-GJV500 (CGI50), SiMo 6		≤300 HB	○
New cast materials ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000)	≤1000		○
	EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1400		○
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
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	≤1400		●
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	≤650		○
Al cast alloys ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
≤ 24 % 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	≤400		○
Copper, low-alloyed	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤600		○
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	≤850		○
Bronze, long-chipping	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤850		○
	2.0980 CuAl11Ni, 2.1247 CuBe2	≤1000		○
Duroplastics	Epoxy resin, Resopal, Pertinax, Moltopren	≤150		○
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	≤100		○
Kevlar	Kevlar	≤1000		○
Glass, carbon concentr. plastics	GFK/CFK	≤1000		○



HARTNER

88200	88021
335	335
HSS	HSS
bright	bright
90°	90°
cyl.	cyl.

88201	88022
335	335
HSS-E	HSS-E
TiAlN	TiAlN
90°	90°
cyl.	cyl.



V _e m/min	Feed column no.	
32	85	85
30	85	85
32	85	85
30	85	85
32	85	85
30	85	85
20	84	84
15	84	84
12	84	84
25	85	85
15	84	84
10	84	84
15	85	85
12	84	84
17	84	84
15	84	84
15	84	84
10	84	84
16	84	84
12	84	84
14	84	84
25	85	85
16	84	84
22	84	84
20	84	84
8	84	84
25	84	84
16	84	84
8	84	84
15	85	85
10	85	85
90	85	85
70	86	86
40	85	85
30	85	85
100	86	86
60	84	84
80	85	85
50	85	85
30	86	86
26	86	86
24	86	86
20	86	86
30	84	84
40	85	85
70	84	84

V _e m/min	Feed column no.	
41	83	83
39	82	82
41	83	83
39	82	82
41	83	83
39	83	83
25	82	82
19	83	83
15	82	82
32	83	83
19	83	83
13	82	82
19	82	82
15	81	81
22	82	82
19	81	81
19	81	81
13	81	81
20	82	82
15	81	81
18	81	81
32	83	83
20	83	83
28	83	83
25	83	83
10	81	81
28	83	83
18	83	83
10	81	81
19	82	82
13	81	81
114	84	84
89	84	84
51	83	83
39	83	83
127	84	84
76	84	84
101	84	84
64	84	84
39	84	84
33	84	84
31	84	84
25	84	84
39	84	84
51	84	84

THE HARTNER PROGRAMME



▼ FU 500 / FN 500



▼ GUN DRILLS



▼ INOX DRILLS



▼ MICRO PRECISION DRILLS



▼ THREADING TOOLS



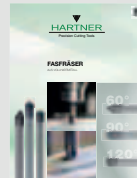
▼ TS-DRILLS



▼ TF 100 MULTI-MILL



▼ SOLID CARBIDE
MILLING CUTTERS



▼ CHAMFERING
MILLING CUTTERS



▼ MULTIPLEX



▼ MULTIPLEX HPC

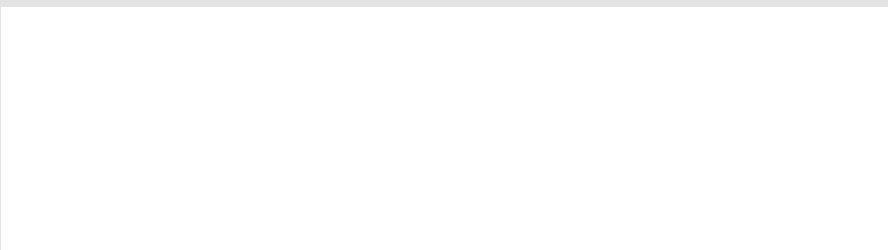


▼ TM VENDING MACHINES

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