



NEW

SpyroTec 60°



SpyroTec 90°

NEW

SpyroTec 82°



Countersinks with convex cutting edges

- round, precise and chatter-free countersinking
- reduction of feed force by 60 %
- reduction of radial force by 50 %
- **NEW:** 60° and 82° countersinks, 90° countersinks up to Ø40 mm

SpyroTec

Helical HSS and HSCO countersink

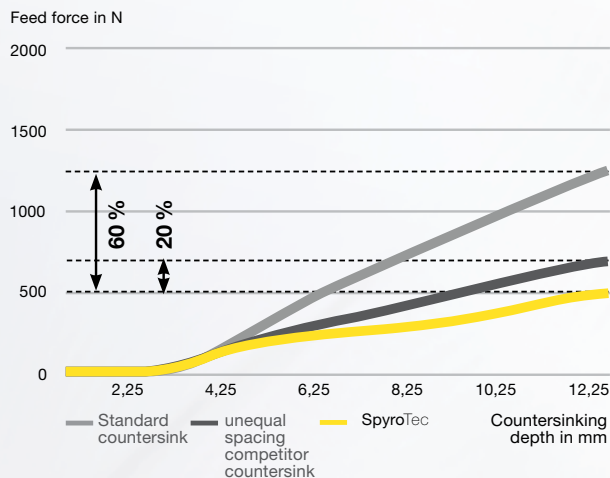
GUHRING – YOUR WORLDWIDE PARTNER

SpyroTec

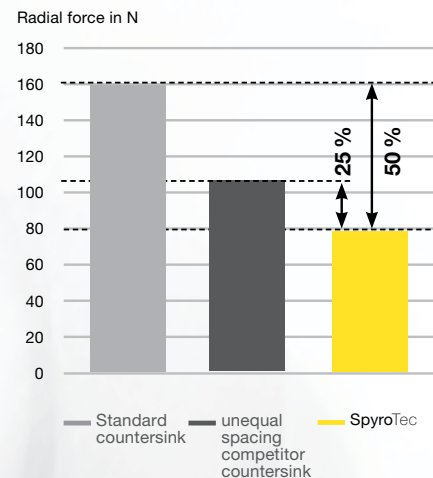
THE INNOVATIVE, HELICAL HSS AND HSCO COUNTERSINK

The axial and radial forces that occur during countersinking operations are significantly reduced due to the unique geometry of the SpyroTec cutting edges. The convex form and variable pitch of the helical cutting edges results in a stable countersinking process with minimal vibration, even when

using a hand drill. Round, precise, chatter-free countersinking is guaranteed. The TiAlN coating ensures higher wear resistance and thermal protection, which guarantees longer tool life in many different materials and applications.



LOWER FEED FORCE BY APPROX. 60%
COMPARED TO STANDARD COUNTERSINKS



LOWER RADIAL FORCE BY APPROX. 50%
COMPARED TO STANDARD COUNTERSINKS

- standard program
- 90°, 82°, and 60° countersinks
- round shank version
- tri-flat shank version
- long length round shank version



Countersinking with standard countersink



SpyroTec

NEW
90° countersinks up to Ø40mm,
new 82° & 60° countersink



CONVEX CUTTING EDGES

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

TiAIN COATING

The TiAIN coating provides high hardness and excellent thermal protection.

CUTTING MATERIAL

The high-quality HSS and HSCO substrates hold up well in high-temperature applications, providing long tool life in a wide variety of materials.

ISO code

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

On the following tool selection pages you will find recommendations regarding application suitability based on material groups for every tool.

★ = 1st choice

• = Optimal suitability

○ = Secondary

Pictograms

Tool material	HSS	M35 Cobalt	M42 Cobalt	HSS-E- PM	Carbide					
Cutting depth	1xD Cutting depth	1.5xD Cutting depth	3xD Cutting depth	4xD Cutting depth	5xD Cutting depth	7xD Cutting depth	8xD Cutting depth	10xD Cutting depth		
Tolerance on Ø	m7 Tolerance on Ø	h5 Tolerance on Ø	h6 Tolerance on Ø	h7 Tolerance on Ø	h8 Tolerance on Ø	0/-0.004 Tolerance on Ø				
Shank form	HA Shank form straight	HB Shank form weld on flat	HE Shank form whistle notch	Cyl Shank form straight cylindrical		MT Shank form Morse taper				
Cutting direction	R Cutting direction right	L Cutting direction left			N Cutting direction neutral					
Internal coolant	Internal coolant	Without internal coolant								
Form	A Form	B Form	R Form							
Point angle	90° Point angle	118° Point angle	120° Point angle	130° Point angle	135° Point angle	140° Point angle	150° Point angle	160° Point angle	125° Point angle	
Web thinning	Web Thinning									
Type	EB 100 Type	GT 100 Type	HT 800 WP Type	H Type	N Type	RT 100 T Type	RT 100 U Type	W Type		

Coatings

 bright

 steam oxide

 nitrided

 nitrided lands

 TiN

 TiAlN

 SuperA™

 nano-A™

 FIREX/nano-FIREX

 TiCN

 nano-Si™

 nickel-plated

Material classifications

	Material group	Examples
P	Common structural steels	A283, A516, Gr50, 30, 35, 42, 45, 50, 55, 60, 65, 70, 75 , 80, 85, 90, 100, 110, 135, 140, 145, 150, 160
	Free-cutting steels	1151, 1215, L10, 10L10, 10L15, 10L17, 10L20, 10L23, 10L25, 10L30, 10L35, 10L40, 10L42, 10L45, 10L49, 10L50, 10L55, 11L15, 11L16, 11L17, 11L37, 11L38, 11L39, 11L41, 11L44, 11L46, 12L11, 12L12, 12L13, 12L14, 12L15, 41L25, 41L30, 41L35, 41L40, 41L42, 41L47, 41L50 51L15, 51L17, 51L20, 86L20, 86L40
	Unalloyed heat-treatable steels	1005, 1006, 1008, 1009, 1010, 1011, 1012, 1013, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1025, 1026, 1029, 1030, 1033, 1035, 1037, 1038, 1039, 1040, 1042, 1043, 1044, 1045, 1046, 1049, 1050, 1053, 1055, 1059, 1060, 1064, 1065, 1069, 1070, 1071, 1074, 1075, 1078, 1080, 1084, 1085, 1086, 1090, 1095
	Alloyed heat-treatable steels	1330, 1335, 1340, 1345, 2340, 3140, 3145, 3150, 3230, 3240, 3335, 3340, 3435, 3450, 4032, 4037, 4063, 4130, 4135, 4137, 4140, 4142, 4145, 4147, 4150, 4161, 4337, 4340, 4640, 5045, 5046, 5060, 5130, 5132, 5135, 5140, 5145, 5157, 5150, 5155, 5160, 6130, 6135, 6140, 6145, 6150, 7140, 6145, 6150, 7140, 8630, 8632, 8635, 8637, 8640, 8642, 8645, 8650, 8650, 8660, 8735, 8740, 8742, 9250, 9254, 9255, 9260, 9262, 9840, 9850
	Unalloyed case hardened steels	1005, 1006, 1008, 1009, 1010, 1011, 1012, 1013, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1025, 1026, 1029, 1030, 1033, 1035, 1037, 1038, 1039, 1040, 1042, 1043, 1044, 1045, 1046, 1049, 1050, 1053, 1055, 1059, 1060, 1064, 1065, 1069, 1070, 1071, 1074, 1075, 1078, 1080, 1084, 1085, 1086, 1090, 1095
	Alloyed case hardened steels	2317, 2512, 2515, 2517, 3115, 3120, 3215, 3220, 3312, 3316, 3325, 4012, 4023, 4024, 4027, 4028, 4118, 4119, 4125, 4317, 4320, 4419, 4422, 4427, 4608, 4615, 4617, 4620, 4621, 4626, 4718, 4720, 4815, 4817, 4820, 5015, 5115, 5117, 5120, 6115, 6118, 6120, 6125, 8115, 8615, 8617, 8620, 8622, 8625, 8627, 8720, 8822, 9310, 9315, 9317
	Nitriding steels	1132, 1137, 1138, 1139, 1140, 1141, 1144, 1145, 1146, 1151
	Tool steels	A2, A3, A4, A5, A6, A8, A9, A10, O1, O2, O6, O7, A7, D2, D3, D4, D5, D7, H10, H11, H12, H13, H14, H19, H20, H21, H22, H23, H24, H25, H26, H41, H42, H43, L1, L3, W1, W2, W5
	High speed steels	M1, M2, M3-1, M3-2, M4, M6, M7, M10, M30, M33, M34, M36, M41, M42, M43, M44, M46, M47, T1, T2, T4, T5, T6, T8, T15
	Spring steels	5150, 5155, 6145, 6150, 9255
H	Hardened steels >48-60 Rc	Heat Treated Steels
M	Stainless steels, sulphured	203 Ez, 303 Se, 303 Ma, 303 Pb, 303 PlusX, 430F Se, 416 Se, 416 PlusX, 420F, 420F Se, 440F, 440F Se
	austenitic	201, 202, 301, 302B, 303, 304, 304L, 305, 308, 309, 309S, 310, 310S, 314, 316, 316L, 317, 321, 330, 347, 348, 384, 385, Nitronic 32, Nitronic 33, Nitronic 40, Nitronic 50, Nitronic 60, 17-7PH
	martensitic	403, 405, 410, 414, 416, 420, 422, 430, 431, 440A, 440B, 440C, 446, 501, 502, 630, Greek Ascoloy
K	Cast iron	A48-20 B, A48-30 B, A48-40 B, A48-50B, A159G1800, A159G2500, A159G3000, A159G3500, A159G4000
	Spheroidal graphite iron and malleable cast iron	60-10-18, 60-40-18, 65-45-12, 80-55-06, 100-70-03, 120-90-02, 32510, 35018, 40010, 50005, 60004, 70003, 80002, 90001, A220-70003, A220-8002, A536
	Chilled cast iron	
S	Special alloys	Inconel, Hastelloy, Monel, Nimonic, MAR-M246, DS-Ni, Waspalloy, Rene41
	Ti and Ti-alloys	Ti6AL4V, 5390A, TiCu2
N	Aluminium and Al-alloys	EC 1060, 1100, 1145, 1175, 1235, 2011, 2014, 2017, 2018, 2021, 2024, 2025, 2117, 2218, 2219, 2618, 3003, 3004, 3005, 4032, 4032-T6, 5005, 5050, 5052, 5056, 5083, 5086, 5154, 5252, 5254, 5454, 5456, 5457, 5652, 5657, 6053, 6061, 6061-T6, 6063, 6066, 6070, 6101, 6151, 6253, 6262, 6463, 6951, 7001, 7004, 7005, 7039, 7049, 7050, 7075, 7075-T6, 7079, 7175, 7178
	Al wrought alloys	1100-0, 3003-H18, 5056-0, 2024-T4, 4043-H18
	Al cast alloys	295-T6, 319-F, 356-T6, 380-F, 384-F, 390-F, 443-F, 413-F, 518-F, 713-TS, 850-TS
	Magnesium alloys	AZ31B, AZ63A, AZ80A, AZ91C, EZ33A, HK31A, QE22A, ZK60A
	Copper, low-alloyed	C10100, C27000, C71500, C52400, C77000, C17200, C71500, C95500, C86500
	Brass, short-chipping	CUZn10, CUZn20



90° Countersinks, SpyroTec

Series

5500



C

Tool material

HSCO

Coating

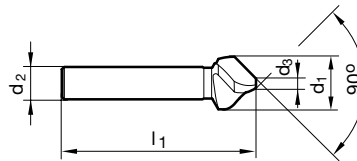
TiAlN

Shank form

cyl.

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	○
S	Ni / Ti alloys	○
H	Hardened steel	
●=Optimal ○=Secondary		

- 3 different convex cutting edges
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application



d1	d2	d3	l1	Z	Code no.	EDP Number
mm	mm	mm	mm			
6.300	5.000	1.500	45.000	3	6.300	9055000063000
8.000	6.000	2.000	50.000	3	8.000	9055000080000
8.300	6.000	2.000	50.000	3	8.300	9055000083000
10.000	6.000	2.500	50.000	3	10.000	9055000100000
10.400	6.000	2.500	50.000	3	10.400	9055000104000
11.500	8.000	2.800	56.000	3	11.500	9055000115000
12.400	8.000	2.800	56.000	3	12.400	9055000124000
15.000	10.000	3.200	60.000	3	15.000	9055000150000
16.500	10.000	3.200	60.000	3	16.500	9055000165000
19.000	10.000	3.500	63.000	3	19.000	9055000190000
20.500	10.000	3.500	63.000	3	20.500	9055000205000
23.000	10.000	3.800	67.000	3	23.000	9055000230000
25.000	10.000	3.800	67.000	3	25.000	9055000250000
31.000	12.000	4.200	71.000	3	31.000	9055000310000
40.000	12.000	10.000	75.000	3	40.000	9055000400000

90° Countersinks, SpyroTec

Series

5501



C

Tool material

HSCo

Coating

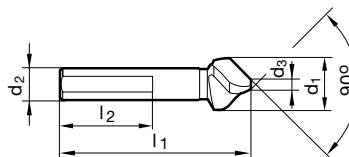
TiAlN 

Shank form

tri-flat

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	○
S	Ni / Ti alloys	○
H	Hardened steel	
●=Optimal ○=Secondary		

- 3 different convex cutting edges
- tri-flat shank prevents slipping in the chuck
- perfect for hand drills
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application



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10.400	6.000	2.500	50.000	30.000	3	10.400	9055010104000
11.500	8.000	2.800	56.000	30.000	3	11.500	9055010115000
12.400	8.000	2.800	56.000	30.000	3	12.400	9055010124000
15.000	10.000	3.200	60.000	30.000	3	15.000	9055010150000
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19.000	10.000	3.500	63.000	30.000	3	19.000	9055010190000
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31.000	12.000	4.200	71.000	30.000	3	31.000	9055010310000
40.000	12.000	10.000	75.000	30.000	3	40.000	9055010400000



90° Countersinks, SpyroTec

Series

5503



C

Tool material

HSCo

Coating

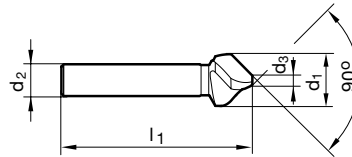
TiAlN

Shank form

cyl.

Material		Suitability
P	Steel	●
M	Stainless steel	○
K	Cast iron	●
N	Aluminum	○
S	Ni / Ti alloys	○
H	Hardened steel	
●=Optimal ○=Secondary		

- long version for recessed machining points
- 3 different convex cutting edges
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application



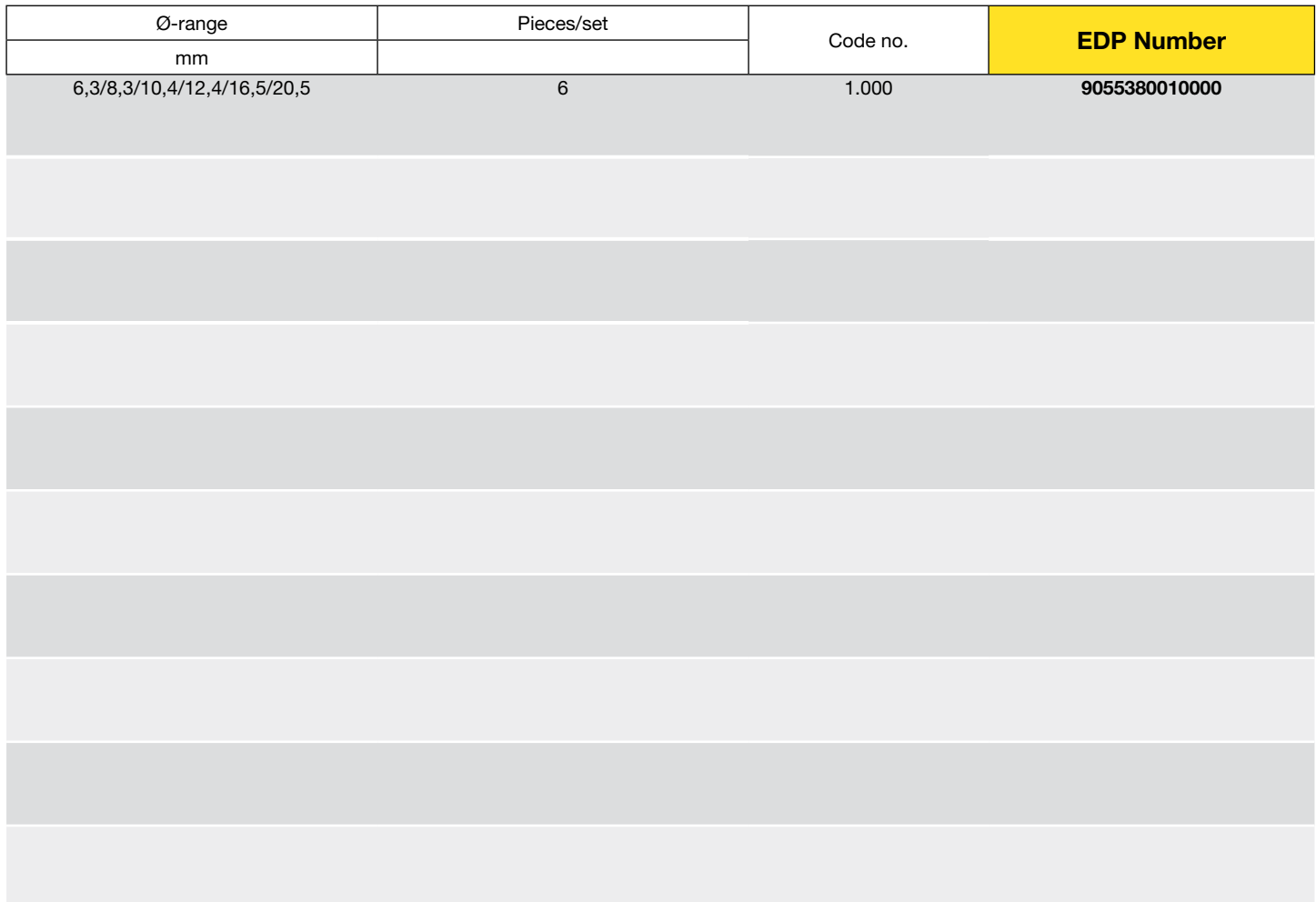
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12.400	8.000	2.800	108.000	3	12.400	9055030012400
16.500	10.000	3.200	111.000	3	16.500	9055030016500
20.500	10.000	3.500	114.000	3	20.500	9055030020500
25.000	10.000	3.800	118.000	3	25.000	9055030025000
31.000	12.000	4.200	140.000	3	31.000	9055030031000

5538



- consisting of art. no. 5500
- 3 different convex cutting edges
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application

cyl.



90° Countersink sets, SpyroTec



C

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	○
S	Ni / Ti alloys	○
H	Hardened steel	

●=Optimal ○=Secondary

- consisting of art. no. 5501
- 3 different convex cutting edges
- tri-flat shank prevents slipping in the chuck
- perfect for hand drills
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application

Series	5539
Tool material	HSCo
Coating	TiAlN
Shank form	tri-flat

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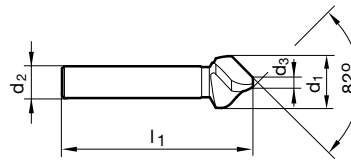
5674



- 3 different convex cutting edges
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application

●=Optimal ○=Secondary

cyl.



82° Countersinks, SpyroTec

Series

5675



C

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	○
S	Ni / Ti alloys	○
H	Hardened steel	

●=Optimal ○=Secondary

- 3 different convex cutting edges
- tri-flat shank prevents slipping in the chuck
- perfect for hand drills
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application

Tool material

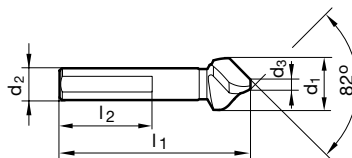
HSCO

Coating

TiAIN **A**

Shank form

tri-flat



d1	d2	d3	l1	l2	Z	Code no.	EDP Number
frac.	inch	inch	inch	inch			
1/4	0.2500	0.0600	2.000	1.18	3	6.350	9056750063500
5/16	0.2500	0.0800	2.000	1.18	3	7.938	9056750079380
3/8	0.2500	0.0900	2.000	1.18	3	9.525	9056750095250
1/2	0.3750	0.1500	2.250	1.18	3	12.700	9056750127000
5/8	0.3750	0.1800	2.250	1.18	3	15.875	9056750158750
3/4	0.5000	0.2100	2.750	1.18	3	19.050	9056750190500
7/8	0.5000	0.2300	2.750	1.18	3	22.225	9056750222250
1	0.5000	0.2500	2.750	1.18	3	25.400	9056750254000
1 1/4	0.5000	0.3700	3.000	1.18	3	31.750	9056750317500

5676



- consisting of art. no. 5674
- 3 different convex cutting edges
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application

cyl.

[illegible]

82° Countersink sets, SpyroTec



C

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	○
S	Ni / Ti alloys	○
H	Hardened steel	

●=Optimal ○=Secondary

- consisting of art. no. 5675
- 3 different convex cutting edges
- tri-flat shank prevents slipping in the chuck
- perfect for hand drills
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application

Series

5677

Tool material

HSCO

Coating

TiAIN 

Shank form

tri-flat

NEW

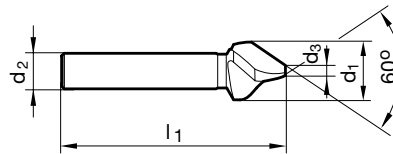
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5670



- 3 different convex cutting edges
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application

●=Optimal ○=Secondary



GUHRING

60° Countersinks, SpyroTec

Series

5671

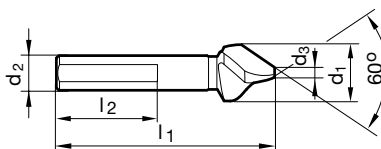


C

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	○
S	Ni / Ti alloys	○
H	Hardened steel	

●=Optimal ○=Secondary

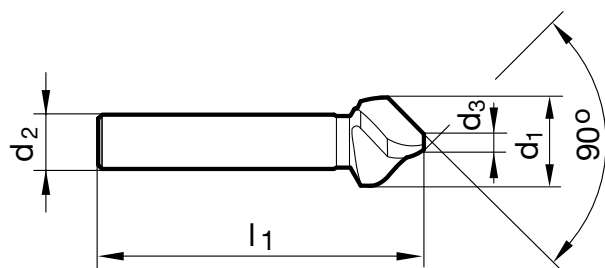
- 3 different convex cutting edges
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d1	d2	d3	l1	l2	Z	Code no.	EDP Number
mm	mm	mm	mm	mm			
6.300	5.000	1.600	45.00	30	3	6.300	9056710063000
8.000	6.000	2.000	50.00	30	3	8.000	9056710080000
10.000	6.000	3.200	56.00	30	3	10.000	9056710100000
12.500	8.000	3.200	56.00	30	3	12.500	9056710125000
16.000	10.000	4.000	63.00	30	3	16.000	9056710160000
20.000	10.000	5.000	67.00	30	3	20.000	9056710200000
25.000	10.000	6.300	71.00	30	3	25.000	9056710250000

SPYROTEC – SPIRAL-FLUTED COUNTERSINKS

Suitable for countersinking the smallest allowable hole diameters and screw sizes listed below.



SpyroTec 90°

d1	smallest allowable hole Ø	for countersunk screws ISO 2009, 2010, 7046, 7047	for countersunk screws DIN 7991
6.300	2.00	-	M3
8.000	2.50	M4	-
8.300	2.50	-	M4
10.000	3.00	M5	-
10.400	3.00	-	M5
11.500	3.30	M6	-
12.400	3.30	-	M6
15.000	3.70	M8	-
16.500	3.70	-	M8
19.000	4.50	M10	-
20.500	4.50	-	M10
23.000	4.80	M12	-
25.000	4.80	-	M12
31.000	5.20	-	M16
40.000	12.00	-	M24

SpyroTec 82°

d1 frac.	Smallest hole - Ø to allow countersinking - inch
1/4	0.0830
5/16	0.1020
3/8	0.1100
1/2	0.1730
5/8	0.2010
3/4	0.2520
7/8	0.2720
1	0.2910
1 1/4	0.4090

SpyroTec 60°

d1	smallest hole - Ø to allow countersinking - mm
6.300	2.10
8.000	2.50
10.000	3.00
12.500	3.70
16.000	4.50
20.000	6.00
25.000	7.30



Series # 5500, 5501, 5538, 5539, 5674, 5675

Material group	Hardness		SFM	Feed Rate - IPR								
	HRc	Bhn		6.30 mm	8.00 mm	10.00 mm	12.50 mm	16.00 mm	20.00 mm	25.00 mm	31.50 mm	41.00 mm
				0.248 In.	0.315 In.	0.394 In.	0.492 In.	0.630 In.	0.787 In.	0.984 In.	1.240 In.	1.614 In.
Common structural steels	- ≤ 32	≤ 150 ≤ 301	135 130	0.0045 0.0030	0.0050 0.0030	0.0055 0.0035	0.0060 0.0040	0.0065 0.0045	0.0070 0.0050	0.0085 0.0060	0.0095 0.0065	0.0110 0.0085
Free-cutting steels	≤ 25 ≤ 32	≤ 255 ≤ 301	135 130	0.0045 0.0030	0.0050 0.0030	0.0055 0.0035	0.0060 0.0040	0.0065 0.0045	0.0070 0.0050	0.0085 0.0060	0.0095 0.0065	0.0110 0.0085
Unalloyed heat-treatable steels	≤ 20	≤ 220	135	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0085	0.0095	0.0110
	≤ 25	≤ 255	130	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0085	0.0095	0.0110
	≤ 32	≤ 301	80	0.0030	0.0030	0.0035	0.0040	0.0045	0.0050	0.0060	0.0065	0.0085
Alloyed heat-treatable steels	≤ 32	≤ 301	60	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0085	0.0095	0.0110
	≤ 43	≤ 402	50	0.0030	0.0030	0.0035	0.0040	0.0045	0.0050	0.0060	0.0065	0.0085
Unalloyed case hardened steels	≤ 25	≤ 255	105	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0085	0.0095	0.0110
Alloyed case hardened steels	≤ 32	≤ 301	60	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0085	0.0095	0.0110
	≤ 43	≤ 402	45	0.0030	0.0030	0.0035	0.0040	0.0045	0.0050	0.0060	0.0065	0.0085
Nitriding steels	≤ 32	≤ 301	60	0.0030	0.0030	0.0035	0.0040	0.0045	0.0050	0.0060	0.0065	0.0085
	≤ 43	≤ 402	50	0.0015	0.0020	0.0025	0.0025	0.0030	0.0030	0.0035	0.0045	0.0055
Tool steels	≤ 25	≤ 255	70	0.0030	0.0030	0.0035	0.0040	0.0045	0.0050	0.0060	0.0065	0.0085
	≤ 43	≤ 402	60	0.0015	0.0020	0.0025	0.0025	0.0030	0.0030	0.0035	0.0045	0.0055
High speed steels	≤ 43	≤ 402	60	0.0015	0.0020	0.0025	0.0025	0.0030	0.0030	0.0035	0.0045	0.0055
Spring steels	≤ 38	≤ 354	45	0.0015	0.0020	0.0025	0.0025	0.0030	0.0030	0.0035	0.0045	0.0055
Hardened steels	≤ 48	≤ 460										
	≤ 66	-										
Stainless steels, sulphured	≤ 28	≤ 273	65	0.0030	0.0030	0.0035	0.0040	0.0045	0.0050	0.0060	0.0065	0.0085
	≤ 36	≤ 337	50	0.0015	0.0020	0.0025	0.0025	0.0030	0.0030	0.0035	0.0045	0.0055
	≤ 46	≤ 435	60	0.0015	0.0020	0.0025	0.0025	0.0030	0.0030	0.0035	0.0045	0.0055
Cast iron	≤ 23	≤ 242	105	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0085	0.0095	0.0110
	≤ 38	≤ 354	65	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0085	0.0095	0.0110
Spheroidal graphite iron and malleable cast iron	≤ 23	≤ 242	90	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0085	0.0095	0.0110
	≤ 38	≤ 354	80	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0085	0.0095	0.0110
Chilled cast iron	≤ 38	≤ 354	35	0.0015	0.0020	0.0025	0.0025	0.0030	0.0030	0.0035	0.0045	0.0055
New cast materials GGV	≤ 20	≤ 220	90	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0085	0.0095	0.0110
	≤ 32	≤ 301	60	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0085	0.0095	0.0110
New cast materials ADI	≤ 32	≤ 301										
	≤ 43	≤ 402										
Special alloys	≤ 54	≤ 549	35	0.0015	0.0020	0.0025	0.0025	0.0030	0.0030	0.0035	0.0045	0.0055
Ti and Ti-alloys	≤ 25	≤ 255	60	0.0030	0.0030	0.0035	0.0040	0.0045	0.0050	0.0060	0.0065	0.0085
	≤ 43	≤ 402	45	0.0015	0.0020	0.0025	0.0025	0.0030	0.0030	0.0035	0.0045	0.0055
Aluminium and Al-alloys	-	≤ 120	375	0.0060	0.0065	0.0065	0.0075	0.0085	0.0090	0.0100	0.0120	0.0135
Al wrought alloys	-	≤ 200	290	0.0060	0.0065	0.0065	0.0075	0.0085	0.0090	0.0100	0.0120	0.0135
Al cast alloys ≤ 10 % Si	-	≤ 180	165	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0085	0.0095	0.0110
	-	≤ 180	130	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0085	0.0095	0.0110
Magnesium alloys	-	≤ 120	415	0.0060	0.0065	0.0065	0.0075	0.0085	0.0090	0.0100	0.0120	0.0135
Copper, low-alloyed	-	≤ 150	250	0.0060	0.0065	0.0065	0.0075	0.0085	0.0090	0.0100	0.0120	0.0135
Brass, short-chipping	-	≤ 180	330	0.0060	0.0065	0.0065	0.0075	0.0085	0.0090	0.0100	0.0120	0.0135
	-	≤ 180	210	0.0060	0.0065	0.0065	0.0075	0.0085	0.0090	0.0100	0.0120	0.0135
Bronze, short-chipping	-	≤ 180	130	0.0060	0.0065	0.0065	0.0075	0.0085	0.0090	0.0100	0.0120	0.0135
	≤ 25	≤ 255	110	0.0060	0.0065	0.0065	0.0075	0.0085	0.0090	0.0100	0.0120	0.0135
Bronze, long-chipping	≤ 25	≤ 255	100	0.0060	0.0065	0.0065	0.0075	0.0085	0.0090	0.0100	0.0120	0.0135
	≤ 32	≤ 301	80	0.0060	0.0065	0.0065	0.0075	0.0085	0.0090	0.0100	0.0120	0.0135
Duoplastics			130	0.0060	0.0065	0.0065	0.0075	0.0085	0.0090	0.0100	0.0120	0.0135
Thermoplastics			165	0.0060	0.0065	0.0065	0.0075	0.0085	0.0090	0.0100	0.0120	0.0135
Reinforced plastics - Kevlar												
Reinforced plastics - GFK / CFK												

Series # 5503, 5670, 5671

Material group	Hardness		SFM	Feed Rate - IPR								
	HRc	Bhn		6.30 mm	8.00 mm	10.00 mm	12.50 mm	16.00 mm	20.00 mm	25.00 mm	31.50 mm	41.00 mm
				0.248 in.	0.315 in.	0.394 in.	0.492 in.	0.630 in.	0.787 in.	0.984 in.	1.240 in.	1.614 in.
Common structural steels	-	≤ 150	120	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0085	0.0095	0.0110
	≤ 32	≤ 301	115	0.0030	0.0030	0.0035	0.0040	0.0045	0.0050	0.0060	0.0065	0.0085
Free-cutting steels	≤ 25	≤ 255	120	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0085	0.0095	0.0110
	≤ 32	≤ 301	115	0.0030	0.0030	0.0035	0.0040	0.0045	0.0050	0.0060	0.0065	0.0085
Unalloyed heat-treatable steels	≤ 20	≤ 220	120	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0085	0.0095	0.0110
	≤ 25	≤ 255	115	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0085	0.0095	0.0110
	≤ 32	≤ 301	75	0.0030	0.0030	0.0035	0.0040	0.0045	0.0050	0.0060	0.0065	0.0085
Alloyed heat-treatable steels	≤ 32	≤ 301	55	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0085	0.0095	0.0110
	≤ 43	≤ 402	45	0.0030	0.0030	0.0035	0.0040	0.0045	0.0050	0.0060	0.0065	0.0085
Unalloyed case hardened steels	≤ 25	≤ 255	95	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0085	0.0095	0.0110
Alloyed case hardened steels	≤ 32	≤ 301	55	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0085	0.0095	0.0110
	≤ 43	≤ 402	40	0.0030	0.0030	0.0035	0.0040	0.0045	0.0050	0.0060	0.0065	0.0085
Nitriding steels	≤ 32	≤ 301	55	0.0030	0.0030	0.0035	0.0040	0.0045	0.0050	0.0060	0.0065	0.0085
	≤ 43	≤ 402	45	0.0015	0.0020	0.0025	0.0025	0.0030	0.0030	0.0035	0.0045	0.0055
Tool steels	≤ 25	≤ 255	65	0.0030	0.0030	0.0035	0.0040	0.0045	0.0050	0.0060	0.0065	0.0085
	≤ 43	≤ 402	55	0.0015	0.0020	0.0025	0.0025	0.0030	0.0030	0.0035	0.0045	0.0055
High speed steels	≤ 43	≤ 402	55	0.0015	0.0020	0.0025	0.0025	0.0030	0.0030	0.0035	0.0045	0.0055
Spring steels	≤ 38	≤ 354	40	0.0015	0.0020	0.0025	0.0025	0.0030	0.0030	0.0035	0.0045	0.0055
Hardened steels	≤ 48	≤ 460										
	≤ 66	-										
Stainless steels, sulphured	≤ 28	≤ 273	60	0.0030	0.0030	0.0035	0.0040	0.0045	0.0050	0.0060	0.0065	0.0085
	≤ 36	≤ 337	45	0.0015	0.0020	0.0025	0.0025	0.0030	0.0030	0.0035	0.0045	0.0055
	≤ 46	≤ 435	50	0.0015	0.0020	0.0025	0.0025	0.0030	0.0030	0.0035	0.0045	0.0055
Cast iron	≤ 23	≤ 242	95	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0085	0.0095	0.0110
	≤ 38	≤ 354	60	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0085	0.0095	0.0110
Spheroidal graphite iron and malleable cast iron	≤ 23	≤ 242	80	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0085	0.0095	0.0110
	≤ 38	≤ 354	75	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0085	0.0095	0.0110
Chilled cast iron	≤ 38	≤ 354	30	0.0015	0.0020	0.0025	0.0025	0.0030	0.0030	0.0035	0.0045	0.0055
New cast materials GGV	≤ 20	≤ 220	80	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0085	0.0095	0.0110
	≤ 32	≤ 301	50	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0085	0.0095	0.0110
New cast materials ADI	≤ 32	≤ 301										
	≤ 43	≤ 402										
Special alloys	≤ 54	≤ 549	30	0.0015	0.0020	0.0025	0.0025	0.0030	0.0030	0.0035	0.0045	0.0055
Ti and Ti-alloys	≤ 25	≤ 255	55	0.0030	0.0030	0.0035	0.0040	0.0045	0.0050	0.0060	0.0065	0.0085
	≤ 43	≤ 402	40	0.0015	0.0020	0.0025	0.0025	0.0030	0.0030	0.0035	0.0045	0.0055
Aluminium and Al-alloys	-	≤ 120	340	0.0060	0.0065	0.0065	0.0075	0.0085	0.0090	0.0100	0.0120	0.0135
Al wrought alloys	-	≤ 200	265	0.0060	0.0065	0.0065	0.0075	0.0085	0.0090	0.0100	0.0120	0.0135
Al cast alloys ≤ 10 % Si	-	≤ 180	150	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0085	0.0095	0.0110
	-	≤ 180	115	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0085	0.0095	0.0110
Magnesium alloys	-	≤ 120	375	0.0060	0.0065	0.0065	0.0075	0.0085	0.0090	0.0100	0.0120	0.0135
Copper, low-alloyed	-	≤ 150	225	0.0060	0.0065	0.0065	0.0075	0.0085	0.0090	0.0100	0.0120	0.0135
Brass, short-chipping	-	≤ 180	300	0.0060	0.0065	0.0065	0.0075	0.0085	0.0090	0.0100	0.0120	0.0135
	-	≤ 180	190	0.0060	0.0065	0.0065	0.0075	0.0085	0.0090	0.0100	0.0120	0.0135
Bronze, short-chipping	-	≤ 180	115	0.0060	0.0065	0.0065	0.0075	0.0085	0.0090	0.0100	0.0120	0.0135
	≤ 25	≤ 255	100	0.0060	0.0065	0.0065	0.0075	0.0085	0.0090	0.0100	0.0120	0.0135
Bronze, long-chipping	≤ 25	≤ 255	90	0.0060	0.0065	0.0065	0.0075	0.0085	0.0090	0.0100	0.0120	0.0135
	≤ 32	≤ 301	75	0.0060	0.0065	0.0065	0.0075	0.0085	0.0090	0.0100	0.0120	0.0135
Duroplastics			115	0.0060	0.0065	0.0065	0.0075	0.0085	0.0090	0.0100	0.0120	0.0135
Thermoplastics			150	0.0060	0.0065	0.0065	0.0075	0.0085	0.0090	0.0100	0.0120	0.0135
Reinforced plastics - Kevlar												
Reinforced plastics - GFK / CFK												



Guhring, Inc. Main Office

1445 Commerce Avenue
 Brookfield, WI 53045
 Tel (262) 784-6730 (800) 776-6170
 Fax (262) 784-9096

**Michigan Manufacturing and
 Reconditioning Facility**

24975 Trans-X Road
 Novi, MI 48375

Guhring Corp. (Canada)

20 Steckle Place, Unit #14
 Kitchener, ON N2E 2C3
 Tel (519) 748-9664 (800) 463-5555
 Fax (519) 748-2954

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