



Better Cutter, Better Work

# Cutting Tool (II)

## Step Drills/Countersinks

High Performance Quality For Industrial Applications





## Introduction

Tec-Spiral, with state-of-the-art technology, manufactures a full range of top-quality HSS step drills, countersinks, conical drills, center drills, screw extractors, etc in China.

With the spirit of Continual Innovation, unceasing improvement, we are able to provide not only various standard cutters, but also customized ones

Pro/Step drills are our patented products, with two relief angles, one for positive cutting, the other for clearance space cooling. This special relief angle design enables much better cooling and extra longer tool life comparing with normal step drills, and can be applied to both straight flute type and spiral flute type. Diverse relief angles can be selected to suit drilling on different material.

We are always following the strictest international standard in our production, inspection and quality control. The ISO9001-2008 certification granted by LRQA resulted from our strict quality control system and excellent business management. We never stop the pursuit of constant improvement.

By using high quality HSS&Carbide&Alloy raw material and advanced CNC machine, we are manufacturing first class cutters in modern plant. With remarkable manufacture ability and abundant inventory we can meet customers' various demands in very short time.

Our staff members all bear in mind the importance of customer satisfaction. Advanced technology, stable quality and quick response are the keys to our customer satisfaction.

We are a leading pioneer in the field of countersinks, conical drills, center drills, screw extractors, etc in China. Our products are widely used in the global fields of aviation, shipbuilding, railway construction, automotive industry, heavy industry, mould making, etc. We are providing the best solutions for applications on metal and nonmetal. Great passion is always our inspiration to fulfill the desire of mutual development with our customers and to meet the new challenges.

Warmly welcome your visit at Tec-spiral. We will be at your service at anywhere and any time!

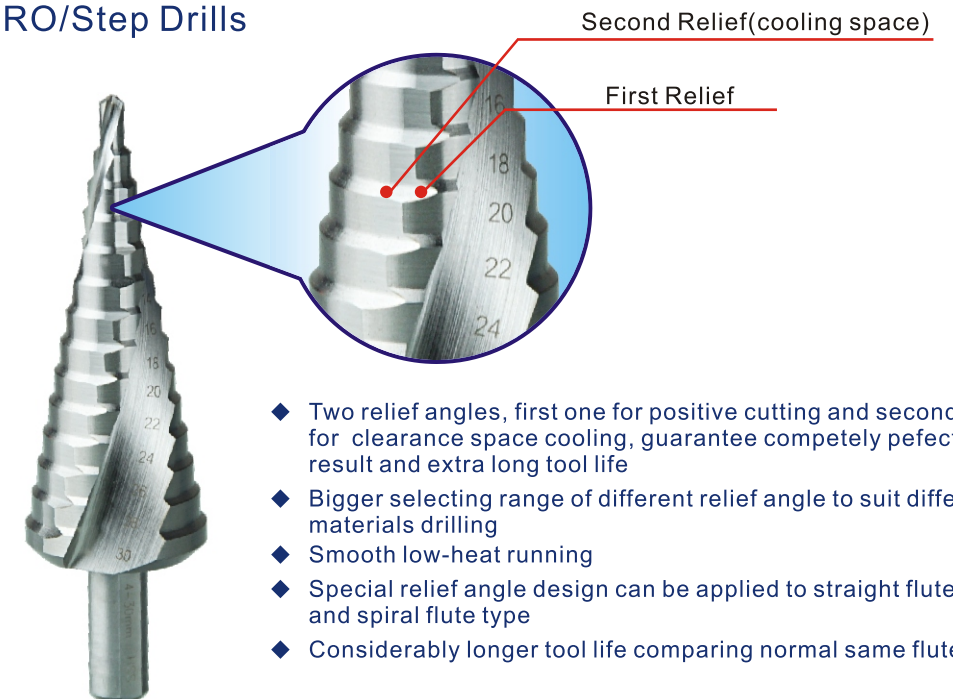
## Step Drills & Conical Drills:

- ◆ Made by High-performance HSS, High wear resistance and long tool life ;
- ◆ Manufactured by advanced CNC machine. High consistency and quality assurance;
- ◆ 118° Split point DIN1412C, good centring, little pressure required;
- ◆ CBN fully ground ensure better and sharper cutting edges
- ◆ Modified cutting angle guarantee smooth running and positive cut
- ◆ Grooves opened wide to allow fast and easy chip removal
- ◆ Each step/cone has constant radially adjusted relief and axially relief
- ◆ A starter hole of the smallest step/cone diameter will speed the drilling process
- ◆ Centered and drilled in one operation
- ◆ Applicable for Tube and Sheets and thin materials such as steel, non-ferrous and light metals, plastic, wood , etc.

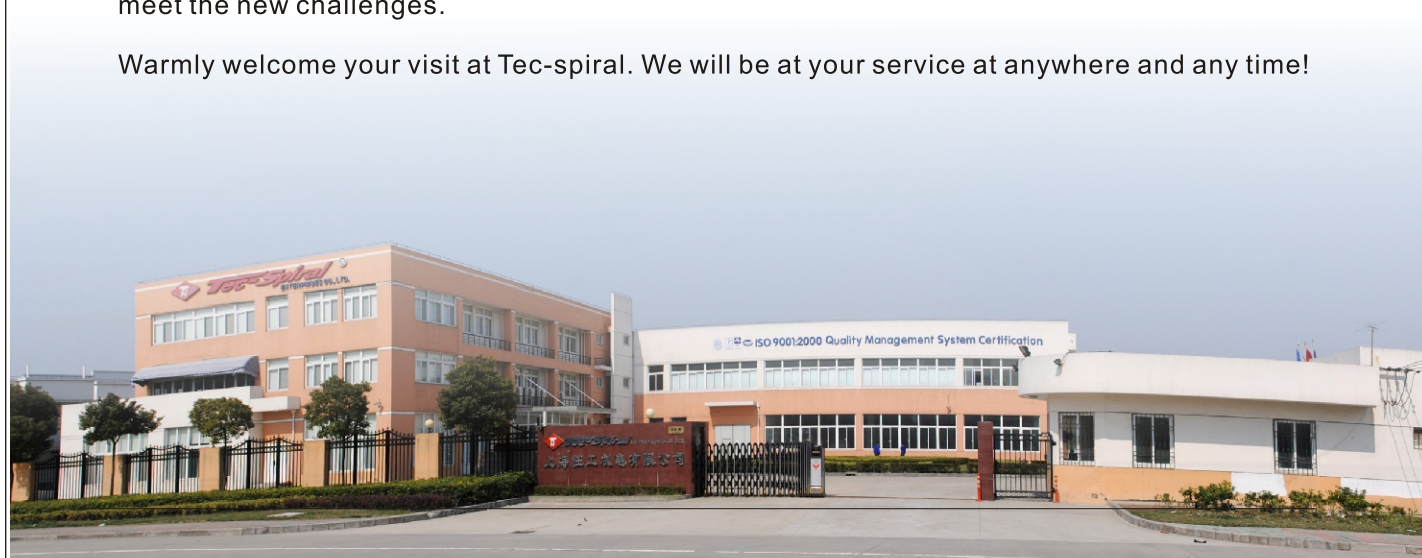


## Patent :

### PRO/Step Drills



- ◆ Two relief angles, first one for positive cutting and second one for clearance space cooling, guarantee completely perfect cooling result and extra long tool life
- ◆ Bigger selecting range of different relief angle to suit different materials drilling
- ◆ Smooth low-heat running
- ◆ Special relief angle design can be applied to straight flute type and spiral flute type
- ◆ Considerably longer tool life comparing normal same flute type

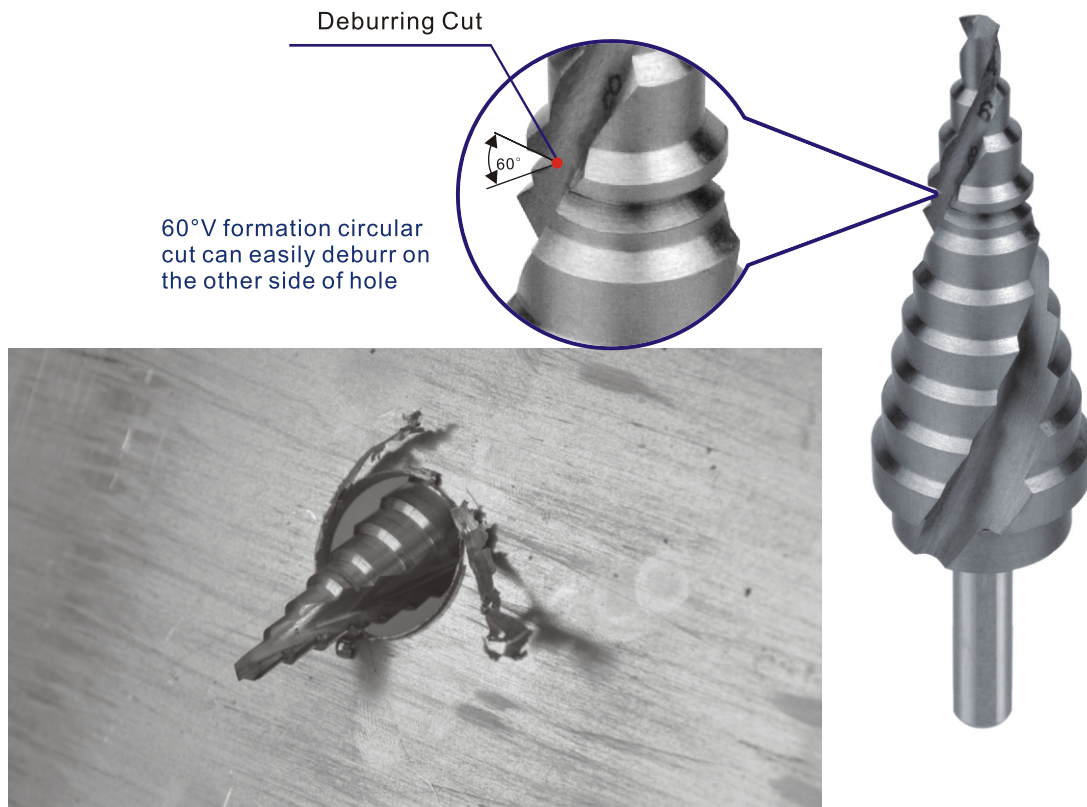




Groove Styles:

Straight flute type	Spiral flute type	Arc flute type
<ul style="list-style-type: none"> <li>General flute type</li> <li>More economical than spiral flute type</li> </ul>	<ul style="list-style-type: none"> <li>Spiral flutes guarantee completely smooth running and high cutting performance</li> <li>Large and Spiral chip space allows faster and easier chip removal</li> <li>Longer tool life compared with straight flute type</li> </ul>	<ul style="list-style-type: none"> <li>Large and arc chip space allows fast and easy chip removal</li> <li>Mainly for American market</li> </ul>

Two Flute Hss Step Drills With Deburring Cut



Recommendations for the use of step drills, Conical drills:

Material	High carb. struc. steel	High carb. struc. steel	Alloy steel	Inox steel (Stainless steel)	Cast iron	Cast iron	CuZn alloy brittle	CuZn alloy tough	Al-alloy <11% Si	Thermo-plastics	Duro-plastics	
	<700 N/mm <sup>2</sup>	>700 N/mm <sup>2</sup>	<1000 N/mm <sup>2</sup>	<1400 N/mm <sup>2</sup>	<250 N/mm <sup>2</sup>	>250 N/mm <sup>2</sup>						
Vc=m/min	30	20	20	10	15	10	60	35	30	20	15	
Coolant	Cutting spray	Cutting spray	Cutting spray	Cutting spray	Compr. Air	Compr. Air	Compr. Air	Compr. Air	Cutting spray	Water	Compr. Air	
Ø mm	Ø inch	r.p.m	r.p.m	r.p.m	r.p.m	r.p.m	r.p.m	r.p.m	r.p.m	r.p.m	r.p.m	
3-8	1/8"-5/16"	3185-1194	2123-796	2123-796	1062-398	1592-597	1062-398	6369-2389	3715-1393	3185-1194	2123-796	1592-597
9-15	11/32"-19/32"	1062-637	708-425	708-425	354-212	531-318	354-212	2123-1274	1238-743	1062-637	708-425	531-318
16-22	5/8"-7/8"	597-434	398-290	398-290	199-145	299-217	199-145	1194-869	697-507	597-434	398-290	299-217
23-29	29/32"-1 5/16"	415-329	277-220	277-220	138-110	208-165	138-110	831-659	485-384	415-329	277-220	208-165
30-36	1 3/16"-1 7/16"	318-265	212-177	212-177	106-88	159-133	106-88	637-531	372-310	318-265	212-177	159-133
37-42	1 15/32"-1 21/32"	258-227	172-152	172-152	86-76	129-114	86-76	516-455	301-265	258-227	172-152	129-114

For longer tool life and better chip removal ability, HSS-E and different coatings are available for different material processing.

HSS-E	TiN	TiAlN
<p>HSS-Co(Cobalt Hss) have higher red hardness permitting drilling of materials such as heat-resistant alloys and materials with hardness greater than 38HRC and high-alloyed chromium steel such as stainless and acid-resistant steel</p>	<p>General purpose coating, high cost-effective, makes the cutter long tool life. Provides cutter surface with a higher degree of hardness and high temperature stability meanwhile lower friction coefficient. Suitable for processing steel and cast iron.</p>	<p>High performance coating with a high degree of hardness, high wear resistance and low heat conductivity. Good chemical stability and oxidation resistance and wear resistance. Suitable for processing heat resisting alloys, high-alloy steel, stainless steel, Titanium alloys and NiCo alloys.</p>

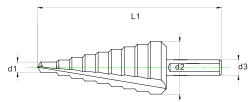
Shank Type:

Cylindrical shank The general shank type	Shank with 3 driving flats prevents slipping in drill chuck and can be effective holding	Hexagon shank Allow quick change

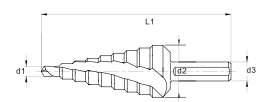


## Two Flute Step Drills, Cylindrical Shank

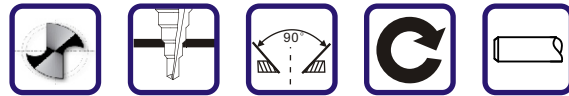
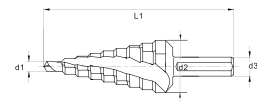
### Straight Flute Type



### Spiral Flute Type



### Pro Step Patent Type



### Step Drills For Metric Hole Diameters

Min-Max d1-d2 ø mm	Steps	Description mm	Overall Length L1 mm	Shank ø d3 mm	Maximum Material Thickness	Straight Flute HSS Shiny Order Number	Spiral Flute HSS Shiny Order Number	Pro Step HSS Shiny Order Number
4-12	5	4-6-8-10-12	65.0	6.00	5.0	14CA00020	14CB00058	14CB00349
4-12	9	4-5-6-7-8-9-10-11-12	65.0	6.00	3.0	14CA00021	14CB00062	14CB00225
4-20	9	4-6-8-10-12-14-16-18-20	75.0	8.00	4.0	14CA00001	14CB00054	14CB00229
4-22	10	4-6-8-10-12-14-16-18-20-22	80.0	10.00	4.0	14CA00022	14CB00069	14CB00233
4-30	14	4-6-8-10-12-14-16-18-20-22-24-26-28-30	100.0	10.00	4.0	14CA00016	14CB00052	14CB00237
4-39	13	4-6-12-15-18-21-24-27-30-33-36-39	107.0	10.00	4.0	14CA00023	14CB00055	14CB00241
5-13	5	5-7-9-11-13	65.0	6.35	6.0	14CA00024	14CB00079	14CB00350
5-25	11	5-7-9-11-13-15-17-19-21-23-25	82.0	9.50	4.0	14CA00025	14CB00083	14CB00245
5-35	13	5-13-15-17-19-21-23-25-27-29-31-33-35	82.0	12.70	3.0	14CA00026	14CB00087	14CB00249
6-20	8	6-8-10-12-14-16-18-20	71.0	9.00	4.0	14CA00027	14CB00091	14CB00253
6-25	7	6-9-12-16-20-22.5-25	65.0	10.00	5.0	14CA00028	14CB00095	14CB00257
6-32	9	6-9-12-16-20-22.5-25-28.5-32	76.0	10.00	5.0	14CA00029	14CB00099	14CB00261
6-36	11	6-9-12-15-18-21-24-27-30-33-36	85.0	10.00	4.0	14CA00030	14CB00103	14CB00265
6-38	12	6-9-13-16-19-21-23-26-29-32-35-38	100.0	10.00	4.5	14CA00031	14CB00107	14CB00269
6-40	16	6-11-17-23-29-30-31-32-33-34-35-36-37-38-39-40	105.0	13.00	4.0	14CA00032	14CB00111	14CB00273
9-36	10	9-12-15-18-21-24-27-30-33-36	85.0	12.00	4.0	14CA00033	14CB00115	14CB00277

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HSS-E / TIN / TiAIN / are available according to requirements

## Two Flute Step Drills, Cylindrical Shank

### Step Drills For Blind Rivets

Maximum Material Thickness: 4mm

Min-Max d1-d2 ø mm	Steps	Description mm	Overall Length L1 mm	Shank ø d3 mm	Remark	Straight Flute HSS Shiny Order Number	Spiral Flute HSS Shiny Order Number	Pro Step HSS Shiny Order Number
4.8-10.65	5	4.8(M3)-6.4(M4)-7.2(M5)-9.6(M6)-10.65(M8)	54.0	6.0		14CA00034	14CB00119	14CB00281

### Step Drills For Steel Conduit Threads

Maximum Material Thickness: 4mm

Min-Max d1-d2 ø mm	Steps	Description mm	Overall Length L1 mm	Shank ø d3 mm	Remark	Straight Flute HSS Shiny Order Number	Spiral Flute HSS Shiny Order Number	Pro Step HSS Shiny Order Number
6-26.75	8	6-9-11.4(PG7)-14(PG9)-17.25(PG11)-19(PG13.5)-21.25(PG16)-26.75(PG21)	75.0	10.0	core holes	14CA00035	14CB00123	14CB00285
6-30.5	9	6-9-12.5(PG7)-15.2(PG9)-18.6(PG11)-20.4(PG13.5)-22.5(PG16)-28.3(PG21)-30.5	80.0	10.0	through holes	14CA00036	14CB00127	14CB00289
6-37	12	6-9-12.5(PG7)-15.2(PG9)-18.6(PG11)-20.4(PG13.5)-22.5(PG16)-26-28.3(PG21)-30.5-34-37(PG29)	100.0	10.0	through holes	14CA00074	14CB00057	14CB00293

### Step Drills For Pipe Threads

Maximum Material Thickness: 4mm

Min-Max d1-d2 ø mm	Steps	Description mm	Overall Length L1 mm	Shank ø d3 mm	Remark	Straight Flute HSS Shiny Order Number	Spiral Flute HSS Shiny Order Number	Pro Step HSS Shiny Order Number
5-28	7	5-8.8(G1/8")-11.8(G1/4")-15.3(G3/8")-19(G1/2")-24.5(G3/4")-28	69.0	10.0	core holes	14CA00038	14CB00134	14CB00297
6-32	8	6-9-11.2(R1/8")-14.5(R1/4")-18.2(R3/8")-22.3(R1/2")-27.9(R3/4")-32	75.0	10.0	external ø, through holes	14CA00039	14CB00138	14CB00301

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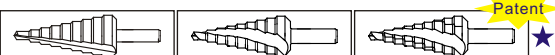
HSS-E / TIN / TiAIN / are available according to requirements



## Two Flute Step Drills, Cylindrical Shank

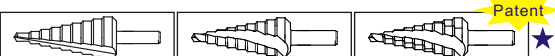
### Step Drills For Cable Connections

Maximum Material Thickness: 4mm

Min-Max d1-d2 ø mm	Steps	Description mm	Overall Length L1 mm	Shank ø d3 mm	Remark			
						Straight Flute HSS Shiny Order Number	Spiral Flute HSS Shiny Order Number	Pro Step HSS Shiny Order Number
5.3-30.5	9	5.3(M6)-7.0(M8)-9.0-10.5(M10)- 14.5(M16)-18.5(M20)-23.5(M25)- 27.0-30.5(M32)	79	10	core holes after DIN/EN 60423	14CA00040	14CB00142	14CB00305
6.5-32.5	9	6.5(M6)-8.5(M8)-10.5(M10)-12.5 (M12)-16.5(M16)-20.5(M20)-25.5 (M25)-29.0-32.5(M32)	79	10	through holes after DIN/EN50262	14CA00075	14CB00351	14CB00352
5.3-38.5	11	5.3(M6)-7.0(M8)-9.0-10.5(M10)- 14.5(M16)-18.5(M20)-23.5(M25)- 27.0-30.5(M32)-34.5-38.5(M40)	96	10	core holes after DIN/EN60423	14CA00042	14CB00150	14CB00313
6.5-40.5	11	6.5(M6)-8.5(M8)-10.5(M10)-12.5 (M12)-16.5(M16)-20.5(M20)-25.5 (M25)-29.0-32.5(M32)-36.5-40.5 (M40)	96	10	through holes after DIN/EN50262	14CA00043	14CB00056	14CB00353
6.5-32.5	12	6.5(M6)-8.5(M8)-10.5(M10)-13 (M12/PG7)-15.7(PG9)-16.5(M16)- 18.6(PG11)-21(M20/PG13.5)-23 PG16)-25.5(M25)-28.8(PG21)- 32.5(M32)	91	10	For cable connections & steel conduit threads, through holes	14CA00044	14CB00157	14CB00321

### Step Drills For Produce Switchboards

Maximum Material Thickness: 2mm

Min-Max d1-d2 ø mm	Steps	Description mm	Overall Length L1 mm	Shank ø d3 mm	Remark			
						Straight Flute HSS Shiny Order Number	Spiral Flute HSS Shiny Order Number	Pro Step HSS Shiny Order Number
4-12	9	4-5-6-7-8-9-10-11-12	48	6		14CA00045	14CB00161	N/A
4-20	9	4-6-8-10-12-14-16-18-20	58	8		14CA00076	14CB00165	N/A
4-30	14	4-6-8-10-12-14-16-18-20-22-24-26 -28-30	72	10		14CA00047	14CB00169	N/A

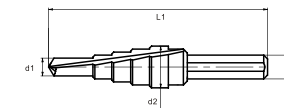
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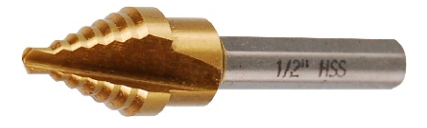
## Two Flute Step Drills, Cylindrical Shank

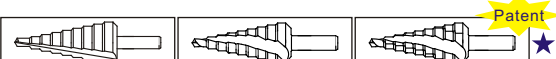
### Step Drills For Imperial Hole Diameters

Imperial Type



Single Hole Type



Min-Max d1-d2 ø Inch	Steps	Description Inch	Overall Length L1 Inch	Shank ø d3 Inch	Maximum Material Thickness			
						Straight Flute HSS Shiny Order Number	Spiral Flute HSS Shiny Order Number	Pro Step HSS Shiny Order Number
3/16"-1/2"	6	3/16-1/4-5/16-3/8-7/16-1/2"	3 1/4"	1/4"	3/8"	14CA00048	14CB00173	14CB00325
1/8"-1/2"	13	1/8-5/32-3/16-7/32-1/4-9/32-5/16- 11/32-3/8-13/32-7/16-15/32-1/2"	3 1/8"	1/4"	1/8"	14CA00049	14CB00177	14CB00329
1/4"-3/4"	9	1/4-5/16-3/8-7/16-1/2-9/16-5/8- 11/16-3/4"	2 3/4"	3/8"	1/8"	14CA00050	14CB00181	14CB00333
3/16"-7/8"	12	3/16-1/4-5/16-3/8-7/16-1/2-9/16-5/8 -11/16-3/4-13/16-7/8"	3 1/4"	3/8"	1/8"	14CA00051	14CB00185	14CB00337
5/16"-1"	9	5/16-1/2-9/16-5/8-11/16-3/4-13/16- 7/8-15/16-1"	3 1/4"	3/8"	1/8"	14CA00077	14CB00189	14CB00341
1/4"-1 3/8"	10	1/4"-3/8"-1/2"-5/8"-3/4"-7/8"-1-1/8" -1-7/32"-1-1/4"-1-3/8"	3 1/8"	1/2"	1/8"	14CA00053	14CB00193	14CB00345
3/8"-1/2"	2	3/8-1/2"	1 7/8"	1/4"	1/8"	14CA00054	14CB00197	14CB00354
7/8"-1 1/8"	2	7/8-1 1/8"	3 1/8"	3/8"	1/8"	14CA00078	14CB00355	14CB00356
3/8"	1	3/8"	1 3/4"	1/4"	N/A	14CB00079	N/A	N/A
1/2"	1	1/2"	1 7/8"	1/4"	N/A	14CB00080	N/A	N/A
7/8"	1	7/8"	2 5/8"	3/8"	N/A	14CB00081	N/A	N/A
1 1/8"	1	1 1/8"	3 1/8"	1/2"	N/A	14CB00082	N/A	N/A
1 7/32"	1	1 7/32"	3 1/4"	1/2"	N/A	14CB00083	N/A	N/A

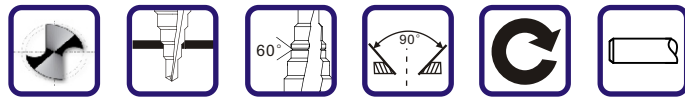
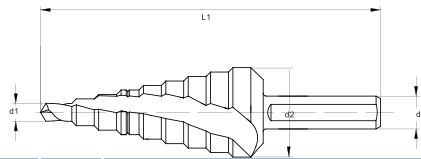
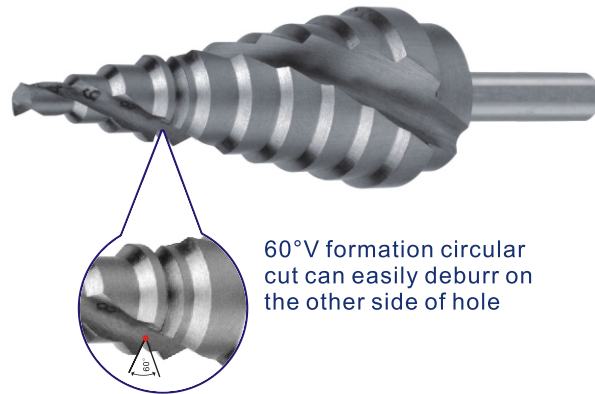
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**Two Flute HSS Step Drills With Deburring Cut, Cylindrical Shank  
Spiral Flute Type**

- ◆ 60°V formation circular cut can easily deburr on the other side of hole
- ◆ Spiral flutes guarantee completely smooth running and high cutting performance
- ◆ Large and Spiral chip space allows faster and easier chip removal
- ◆ High positive cut, extra rake angle
- ◆ Longer tool life compared with straight flute type



Min-Max d1-d2 ø mm	Steps	Description mm	Overall Length L1 mm	Shank ø d3 mm	Maximum Material Thickness mm	HSS Shiny Order Number
4-12	5	4-6-8-10-12	65.0	6.0	5.0	14CL00001
4-12	9	4-5-6-7-8-9-10-11-12	65.0	6.0	3.0	14CL00005
4-20	9	4-6-8-10-12-14-16-18-20	75.0	8.0	4.0	14CL00009
4-30	14	4-6-8-10-12-14-16-18-20-22-24-26-28-30	100.0	10.0	4.0	14CB00013
6-25	7	6-9-12-16-20-22.5-25	65.0	10.0	5.0	14CB00017
6-38	12	6-9-13-16-19-21-23-26-29-32-35-38	100.0	10.0	4.5	14CB00021
6.5-32.5	12	6.5(M6)-8.5(M8)-10.5(M10)-13(M12/PG7)-15.7(PG9)-16.5(M16)-18.6(PG11)-21(M20/PG13.5)-23(PG16)-25.5(M25)-28.8(PG21)-32.5(M32)	91.0	10.0	4.0	14CB00025

are available.

are available according to requirements

**3pcs Two Flute HSS Step Drills Set, Cylindrical Shank**

**In Metal Box**

- ◆ Group of 3 pcs common size for general applications
- ◆ Metal Box with stand packing protects cutting edges and convenient for picking and storage



Contents							
Drilling Range	Steps	Description mm	Overall Length L1 mm	Shank ø D3 mm	Straight Flute HSS Shiny Order Number	Spiral Flute HSS Shiny Order Number	Pro Step HSS Shiny Order Number
4-12	9	4-5-6-7-8-9-10-11-12	65.0	6.0			
4-20	9	4-6-8-10-12-14-16-18-20	75.0	8.0	27AC00017	27AC00018	27AC00019
4-30	14	4-6-8-10-12-14-16-18-20-22-24-26-28-30	100.0	10.0			

**In Plastic Box**

- ◆ Group of 3 pcs common size for general applications
- ◆ Plastic Box with stand packing protects cutting edges and convenient for picking and storage



Contents							
Drilling Range	Steps	Description mm	Overall Length L1 mm	Shank ø D3 mm	Straight Flute HSS Shiny Order Number	Spiral Flute HSS Shiny Order Number	Pro Step HSS Shiny Order Number
4-12	9	4-5-6-7-8-9-10-11-12	65.0	6.0			
4-20	9	4-6-8-10-12-14-16-18-20	75.0	8.0	27AC00020	27AC00021	27AC00022
4-30	14	4-6-8-10-12-14-16-18-20-22-24-26-28-30	100.0	10.0			

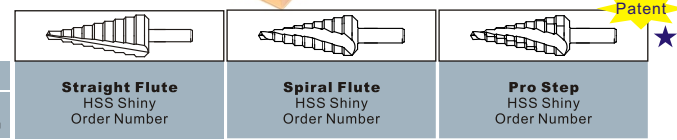
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**3pcs Two Flute HSS Step Drills set, Cylindrical Shank**

**In Wooden Case**

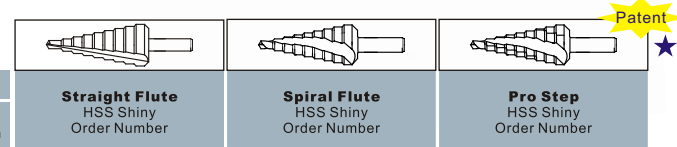
- ◆ Group of 3 pcs common size for general applications
- ◆ Wooden Box with stand packing protects cutting edges and convenient for picking and storage



Contents					Straight Flute HSS Shiny Order Number	Spiral Flute HSS Shiny Order Number	Pro Step HSS Shiny Order Number
Drilling Range	Steps	Description mm	Overall Length L1 mm	Shank ø D3 mm			
4-12	9	4-5-6-7-8-9-10-11-12	65.0	6.0			
4-20	9	4-6-8-10-12-14-16-18-20	75.0	8.0	27AC00023	27AC00024	27AC00025
4-30	14	4-6-8-10-12-14-16-18-20-22-24-26-28-30	100.0	10.0			

**In Blow Molded Case**

- ◆ Group of 3 pcs common size for general applications
- ◆ Blow molded case convenient for picking and storage



Contents					Straight Flute HSS Shiny Order Number	Spiral Flute HSS Shiny Order Number	Pro Step HSS Shiny Order Number
Drilling Range	Steps	Description mm	Overall Length L1 mm	Shank ø D3 mm			
4-12	9	4-5-6-7-8-9-10-11-12	65.0	6.0			
4-20	9	4-6-8-10-12-14-16-18-20	75.0	8.0	27AC00026	27AC00027	27AC00028
4-30	14	4-6-8-10-12-14-16-18-20-22-24-26-28-30	100.0	10.0			

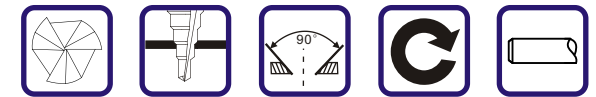
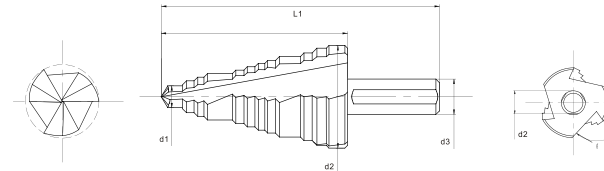
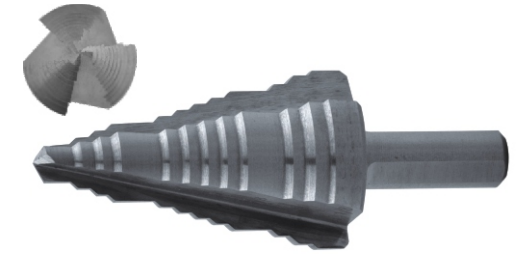
★ Please refer to page 2

HSS-E / TIN / TiAIN / [Icon] / [Icon] are available according to requirements

Special kit contents can be modified.

**Three Flute HSS Step Drills, Cylindrical Shank**  
Straight flute type

- ◆ 3 flutes guarantee absolutely chatter-free working
- ◆ Allow a higher feed especially for non-ferrous materials

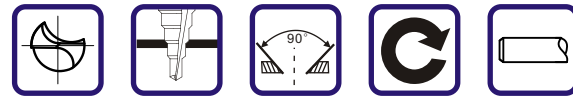
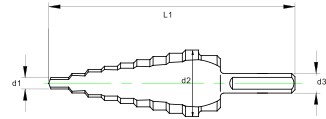


Min-Max d1-d2 ø mm	Steps	Description mm	Overall Length L1 mm	Shank ø D3 mm	Maximum Material Thickness mm	HSS HSS Shiny Order Number
4-12	9	4-5-6-7-8-9-10-11-12	65.0	6.0	3	14CJ00003
4-20	9	4-6-8-10-12-14-16-18-20	75.0	8.0	4	14CJ00004
4-30	14	4-6-8-10-12-14-16-18-20-22-24-26-28-30	100.0	10.0	4	14CJ00005
6-36	11	6-9-12-15-18-21-24-27-30-33-36	85.0	10.0	4	14CJ00006
6-40	16	6-11-17-23-29-30-31-32-33-34-35-36-37-38-39-40	105.0	13.0	4	14CJ00007
9-36	10	9-12-15-18-21-24-27-30-33-36	85.0	12.0	4	14CJ00008
40-50	11	8-13-19-25-31-37-40-41-42-43-44-45-46-47-48-49-50	112.0	13.0	4	14CJ00009
50-60	11	7-14-21-28-35-42-49-50-51-52-53-54-55-56-57-58-59-60	115.0	13.0	4	14CJ00010

HSS-E / TIN / TiAIN / [Icon] / [Icon] are available according to requirements

**Single Flute HSS Step Drill, Cylindrical Shank**  
Arc flute type

- ◆ Large and arc chip space allows fast and easy chip removal
- ◆ Mainly for American market



Min-Max d1-d2 ø Inch	Steps	Description Inch	Overall Length L1 Inch	Shank ød3 Inch	Maximum Material Thickness Inch	HSS HSS Shiny Order Number
3/16" - 1/2"	6	3/16-1/4-5/16-3/8-7/16-1/2"	3 1/4"	1/4"	3/8"	14CH00001
1/8"-1/2"	13	1/8-5/32-3/16-7/32-1/4-9/32-5/16-11/32-3/8-13/32-7/16-15/32-1/2"	3 1/8"	1/4"	1/8"	14CH00007
1/4" - 3/4"	9	1/4-5/16-3/8-7/16-1/2-9/16-5/8-11/16-3/4"	2 3/4"	3/8"	1/8"	14CH00008
3/16" - 7/8"	12	3/16-1/4-5/16-3/8-7/16-1/2-9/16-5/8-11/16-3/4-13/16-7/8"	3 1/4"	3/8"	1/8"	14CH00009
5/16"-1"	9	5/16-1/2-9/16-5/8-11/16-3/4-13/16-7/8-15/16-1"	3 1/4"	3/8"	1/8"	14CH00010
1/4" - 1 3/8"	10	1/4"-3/8"-1/2"-5/8"-3/4"-7/8"-1-1/8"-1-7/32"-1-1/4"-1-3/8"	3 1/8"	1/2"	1/8"	14CH00011
3/8"-1/2"	2	3/8-1/2"	1 7/8"	1/4"	1/8"	14CH00012
7/8" - 1 1/8"	2	7/8-1 1/8"	3 1/8"	3/8"	1/8"	14CH00013
3/8"	1	3/8"	1 3/4"	1/4"	N/A	14CH00014
1/2"	1	1/2"	1 7/8"	1/4"	N/A	14CH00015
7/8"	1	7/8"	2 5/8"	3/8"	N/A	14CH00016
1-1/8"	1	1 1/8"	3 1/8"	1/2"	N/A	14CH00017
1-7/32"	1	1 7/32"	3 1/4"	1/2"	N/A	14CH00018

HSS-E / TIN / TiAIN / [Icons] are available according to requirements

**3pcs Single Flute HSS Step Drill Set, Cylindrical Shank**  
Arc flute type

**In Blow Molded Case**

- ◆ Group of 3 pcs common size for general applications
- ◆ Blow molded case convenient for picking and storage



Contents					HSS HSS Shiny Order Number	HSS-E HSS Shiny Order Number	HSS-TIN HSS Shiny Order Number	HSS-TiAIN HSS Shiny Order Number
Drilling Range	Steps	Description mm	Overall Length L1 mm	Shank ø d3 mm				
1/8" - 1/2"	13	1/8-5/32-3/16-7/32-1/4-9/32-5/16-11/32-3/8-13/32-7/16-15/32-1/2"	3 1/8"	1/4"				
3/16" - 1/2"	6	3/16-1/4-5/16-3/8-7/16-1/2"	3 1/4"	1/4"	27AC00029	27AC00030	27AC00031	27AC00032
1/4" - 3/4"	9	1/4-5/16-3/8-7/16-1/2-9/16-5/8-11/16-3/4"	2 3/4"	3/8"				

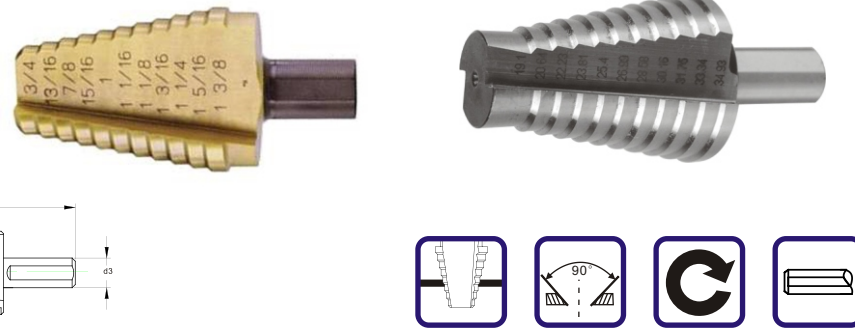
[Icons] are available according to requirements

Special kit contents can be modified.



### Two Flute HSS Hole Enlarging Step Drills, Three Driving Flats Shank Straight flute type

- ◆ 3 driving flat shank prevents slipping in drill chuck
- ◆ Pilot hole required



Min-Max d1-d2 ø	Steps	Description	Overall Length L1	Shank ø d3	Maximum Material Thickness	HSS HSS Shiny Order Number
10-20mm	9	10-11-12-13-14-15-16-17-18-19-20mm	66	8.0	4mm	14CC00212
20-30mm	11	20-21-22-23-24-25-26-27-28-29-30 mm	78	10.0	4mm	14CC00213
30-40mm	11	30-31-32-33-34-35-36-37-38-39-40 mm	78	10.0	4mm	14CC00214
14-24mm	6	14-16-18-20-22-24 mm	70	12.7	5mm	14CC00215
20-34mm	8	20-22-24-26-28-30-32-34mm	70	12.7	5mm	14CC00216
9/16"-1"	8	9/16-5/8-11/16-3/4-13/16-7/8-15/16-1	2 3/4"	1/2"	1/8"	14CC00217
13/16"-1 3/8"	10	13/16-7/8-15/16-1-1 1/16-1 1/8-1 3/16-1 1/4-1 5/16-1 3/8	3 1/4"	1/2"	1/8"	14CC00218

are available according to requirements

### Two Flute HSS Conical Drills, Cylindrical Shank Straight flute type

- ◆ 118° Split point DIN1412C, good centring, little pressure required;
- ◆ CBN fully ground ensure better and sharper cutting edges
- ◆ Grooves opened wide to allow chips away out
- ◆ Positive cut, standard rake angle
- ◆ Constant profile relief
- ◆ Smooth running
- ◆ Centered and drilled in one operation
- ◆ Applicable for Tube and Sheets and thin materials such as steel, non-ferrous and light metals, plastic, wood, etc.



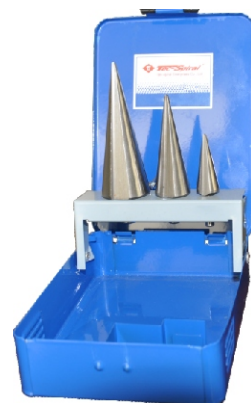
Drilling Range ø mm	Min d1 ø mm	Max d2 ø mm	Overall Length L1 mm	Shank d3 ø mm	HSS HSS Shiny Code No	HSS-E HSS-CO 5 Shiny Code No	HSS TiN Hss TiN Coated Code No	HSS TiAIN Hss TiAIN Coated Code No
3-14	3	14.0	58	6	14HA00003	14HA00038	14HA00016	14HA00029
5-20	5	20.0	71	8	14HA00026	14HA00039	14HA00040	14HA00041
16-30.5	16	30.5	76	9	14HA00042	14HA00043	14HA00044	14HA00045
24-40	24	40.0	89	10	14HA00046	14HA00047	14HA00048	14HA00049
36-50	36	50.0	97	12	14HA00050	14HA00051	14HA00033	14HA00052
40-61	40	61.0	103	13	14HA00053	14HA00054	14HA00055	14HA00056
4-30.5	4	30.5	103	9	14HA00057	14HA00058	14HA00059	14HA00060
5-22.5	5	22.5	79	8	14HA00061	14HA00062	14HA00063	14HA00064
5-25.4	5	25.4	87	10	14HA00065	14HA00066	14HA00067	14HA00068

Shank with 3 driving flats available as per requirements which enables effective holding.

### 3pcs Two Flute HSS Conical Drills Set, Cylindrical Shank Straight flute type

#### In Metal Box

- ◆ Group of 3 pcs common size for general applications
- ◆ Metal Box with stand packing protects cutting edges and convenient for picking and storage



Drilling Range	Contents				HSS	HSS-E	HSS TIN	HSS TiAIN
	D1 Min ø mm	D2 Max ø mm	Overall Length L1 mm	D3 Shank ø mm	HSS Shiny Order Number	HSS Shiny Order Number	HSS Shiny Order Number	HSS Shiny Order Number
3-14	3	14.0	58	6				
5-20	5	20.0	71	8	27AX00005	27AX00006	27AX00007	27AX00008
16-30.5	16	30.5	76	9				

### 3pcs Two Flute HSS Conical Drills Set, Cylindrical Shank Straight flute type

#### In Plastic Box

- ◆ Group of 3 pcs common size for general applications
- ◆ Plastic Box with stand packing protects cutting edges and convenient for picking and storage

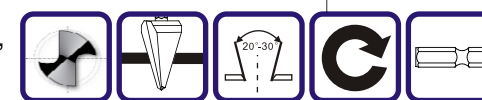
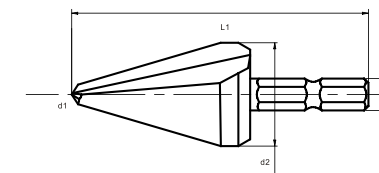


Drilling Range	Contents				HSS	HSS-E	HSS TIN	HSS TiAIN
	D1 Min ø mm	D2 Max ø mm	Overall Length L1 mm	D3 Shank ø mm	HSS Shiny Order Number	HSS Shiny Order Number	HSS Shiny Order Number	HSS Shiny Order Number
3-14	3	14.0	58	6				
5-20	5	20.0	71	8	27AX00009	27AX00010	27AX00011	27AX00012
16-30.5	16	30.5	76	9				

Shank with 3 driving flats available as per requirements which enables effective holding.

### Two Flute HSS Conical Drills, 1/4" Hexagon Shank Straight flute type

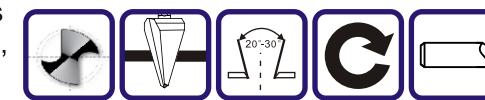
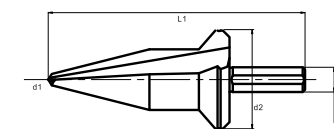
- ◆ 118° Split point DIN1412C, good centring, little pressure required;
- ◆ CBN fully ground ensure better and sharper cutting edges
- ◆ 1/4" hexagon shank to DIN 3126-C6, 3 allow quick change
- ◆ Grooves opened wide to allow chips away out
- ◆ Positive cut, Standard rake angle
- ◆ Constant profile relief
- ◆ Smooth running
- ◆ Centered and drilled in one operation
- ◆ Applicable for Tube and Sheets and thin materials such as steel, non-ferrous and light metals, plastic, wood, etc.



Drilling Range ø mm	Min d1 ø mm	Max d2 ø mm	Overall Length L1 mm	Shank d3 ø mm	HSS	HSS-E	HSS TIN	HSS TiAIN
					HSS Shiny Code No	HSS-CO 5 Shiny Code No	Hss TiN Coated Code No	Hss TiAIN Coated Code No
3-14	3	14	62	6.35	14HB00003	14HB00004	14HB00005	14HB00006
5-20	5	20	78	6.35	14HB00007	14HB00008	14HB00009	14HB00010

### Two Flute HSS Conical Drills With Countersink, Cylindrical Shank Straight flute type

- ◆ 118° Split point DIN1412C, good centring, little pressure required;
- ◆ CBN fully ground ensure better and sharper cutting edges
- ◆ With Countersink for cavity sealing
- ◆ Grooves opened wide to allow chips away out
- ◆ Positive cut, Standard rake angle
- ◆ Constant profile relief
- ◆ Smooth running
- ◆ Centered and drilled in one operation
- ◆ Applicable for Tube and Sheets and thin materials such as steel, non-ferrous and light metals, plastic, wood, etc.



Drilling Range ø mm	Min d1 ø mm	Max d2 ø mm	Overall Length L1 mm	Shank d3 ø mm	HSS	HSS-E	HSS TIN	HSS TiAIN
					HSS Shiny Code No	HSS-CO 5 Shiny Code No	Hss TiN Coated Code No	Hss TiAIN Coated Code No
3-7.8	3	7.8	48	6	14HA00069	14HA00070	14HA00071	14HA00072
3-10.2	3	10.2	52	6	14HA00073	14HA00074	14HA00075	14HA00076
3-11.8	3	11.8	56	6	14HA00077	14HA00078	14HA00079	14HA00080



Countersinks:

Countersinks can be used on existing holes of most materials for deburring, chamfering or hole enlarging. TiN or TiCN coated countersinks are recommended for hard or corrosive materials. Countersinks with special geometry are available for hard to machine materials.



Tec-Spiral offer standard angles: 60°-82°-90°-100°-120°  
Other angles available according to your drawings or requests

Product Features :


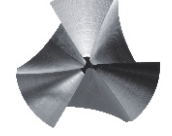
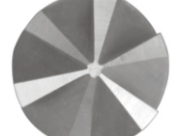
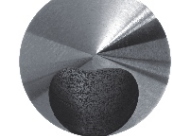
- ◆ Made by High-performance HSS/Tungsten Carbide material, High wear resistance and long tool life ;
- ◆ Manufactured by advanced CNC machine. High consistency and quality assurance;
- ◆ CBN fully ground ensure better and sharper cutting edges
- ◆ Modified cutting angle guarantee smooth running and positive cut
- ◆ Grooves opened wide to allow fast and easy chip removal
- ◆ Constant profile relief
- ◆ Ideal centring features
- ◆ Scratch-free surface
- ◆ Applicable for steel, cast iron, non-ferrous and light metals. Best results at low cutting speeds






Groove Styles:

Straight flute type		Arc flute type	
	<ul style="list-style-type: none"> <li>◆ General flute type</li> <li>◆ More economical than arc flute type.</li> </ul>		<ul style="list-style-type: none"> <li>◆ Large and arc chip space allows faster and easier chip removal</li> <li>◆ High positive cut, extra rake angle</li> <li>◆ Smooth low-heat running</li> <li>◆ Considerably longer tool life</li> </ul>

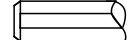

Flute Type:

			
<b>Single Flute Countersinks</b>	<b>Three Flute Countersinks</b>	<b>Multi Flute Countersinks</b>	<b>Zero Flute Deburring Countersinks</b>
Produces excellent roundness of circle, can be used for centering also.	Easy to regrind and work without vibration	For deburring and hole enlarging on hard to machine materials. for the machining of material with tensile strength >1000N/mm <sup>2</sup>	For little chamfering on light metals and plastics.

For longer tool life and better chip removal ability, HSS-E and different coatings are available for different materials processing.

HSS-E 	TiN 	TiAlN 
HSS-Co(Cobalt Hss) have higher red hardness permitting drilling of materials such as heat-resistant alloys and materials with hardness greater than 38HRC and high-alloyed chromium steel such as stainless and acidresistant steel	General purpose coating, high cost-effective, makes the cutter long tool life. Provides cutter surface with a higher degree of hardness and high temperature stability meanwhile lower friction coefficient. Suitable for processing steel and cast iron.	High performance coating with a high degree of hardness, high wear resistance and low heat conductivity. Good chemical stability and oxidation resistance and wear resistance. Suitable for processing heat resisting alloys, high-alloy steel, stainless steel, Titanium alloys and NiCo alloys.

Shank Type:

-  Shank with 3 driving flats prevents slipping in drill chuck and can be effective holding
-  Morse Type shank

Recommendations for the use of NC and Countersinks:

Vc=Speed=m/min.  
Vf=Feed=mm/min.

MATERIAL	3 Flute Type			Zero Type		Single Flute		Chamfer			
	HSS	HSS +TIN	Carbide	HSS	HSS +TIN	HSS	HSS +TIN	HSS	HSS +TIN	Carbide	
Steels <500 N/mm <sup>2</sup>	Vc	17-22	17-22	40-80	35-45	35-45	35-45	35-45	17-22	17-22	40-80
	Ø10	85	85	250	165	165	165	165	85	85	250
	Ø20 Vf	45	45	125	85	85	85	85	45	45	125
	Ø30	30	30	85	55	55	55	55	30	30	85
Steels 500-800 N/mm <sup>2</sup>	Vc	10-15	10-15	30-60	20-30	20-30	20-30	20-30	10-15	10-15	30-60
	Ø10	60	60	170	110	110	110	110	60	60	170
	Ø20 Vf	30	30	85	55	55	55	55	30	30	85
	Ø30	20	20	60	35	35	35	35	20	20	60
Steels 800-1000 N/mm <sup>2</sup>	Vc	8-12	8-12	20-40	15-20	15-20	15-20	15-20	8-12	8-12	20-40
	Ø10	35	35	100	55	55	55	55	35	35	100
	Ø20 Vf	25	25	60	35	35	35	35	25	25	60
	Ø30	15	15	45	25	25	25	25	15	15	45
Steels 1000-1300 N/mm <sup>2</sup>	Vc	6-10	6-16	20-40	12-15	12-15	12-15	12-15	6-10	6-10	20-40
	Ø10	30	30	100	45	45	45	45	30	30	100
	Ø20 Vf	15	15	60	25	25	25	25	15	15	60
	Ø30	10	10	40	20	20	20	20	10	10	40
Abrasion Resistant Steel	Vc			15-20							15-20
	Ø10			55							55
	Ø20 Vf			35							35
	Ø30			25							25
Nimonic	Vc			10-12					4.6		10-12
	Ø10			30					16		30
	Ø20 Vf			16					8		16
	Ø30			10					6		10
Treated Steel Z60 HRC	Vc			8-10							8-10
	Ø10			20							20
	Ø20 Vf			10							10
	Ø30			8							8

Continued .....

Recommendations for the use of NC and Countersinks:

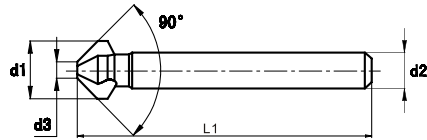
Vc=Speed=m/min.  
Vf=Feed=mm/min.

MATERIAL	3 Flute Type			Zero Type		Single Flute		Chamfer			
	HSS	HSS +TIN	Carbide	HSS	HSS +TIN	HSS	HSS +TIN	HSS	HSS +TIN	Carbide	
Cast iron	Vc	15-25	15-25	40-80	20-40	20-40	20-40	20-40	15-25	15-25	40-80
	Ø10	70	70	250	125	125	125	125	70	70	250
	Ø20 Vf	40	40	150	75	75	75	75	40	40	150
	Ø30	30	30	100	50	50	50	50	30	30	100
Aluminium	Vc	35-45	35-45	40-100	50-60	50-60	50-60	50-60	35-45	35-45	40-100
	Ø10	200	200	350	255	255	255	255	200	200	350
	Ø20 Vf	130	130	230	180	180	180	180	130	130	230
	Ø30	110	110	200	150	150	150	150	110	110	200
Bronze Brass	Vc	20-30	20-30		30-40	30-40	30-40	30-40	20-30	20-30	
	Ø10	120	120		150	150	150	150	120	120	
	Ø20 Vf	85	85		110	110	110	110	85	85	
	Ø30	70	70		90	90	90	90	70	70	
Copper	Vc	15-25	15-25	50-80	20-30	20-30	20-30	20-30	15-25	15-25	50-80
	Ø10	95	95	300	120	120	120	120	95	95	300
	Ø20 Vf	60	60	200	80	80	80	80	60	60	200
	Ø30	45	45	175	65	65	65	65	45	45	175
Laminated	Vc	35-70	35-70		50-100	50-100	50-100	50-100	35-70	35-70	
	Ø10	300	300		400	400	400	400	300	300	
	Ø20 Vf	200	200		300	300	300	300	200	200	
	Ø30	150	150		250	250	250	250	150	150	
PVC Plastics	Vc	35-70	35-70		50-100	50-100	50-100	50-100	35-70	35-70	
	Ø10	400	400		450	450	450	450	400	400	
	Ø20 Vf	300	300		350	350	350	350	300	300	
	Ø30	250	250		300	300	300	300	250	250	



**90° Three Flute Countersinks, Cylindrical Shank**  
Straight Flute Type

- ◆ CBN fully ground ensure better and sharper cutting edges
- ◆ Grooves opened wide to allow chips away out
- ◆ Positive cut, Standard rake angle
- ◆ Constant profile relief
- ◆ Smooth running
- ◆ Ideal centring features
- ◆ Applicable for steel, cast iron, non-ferrous and light metals.

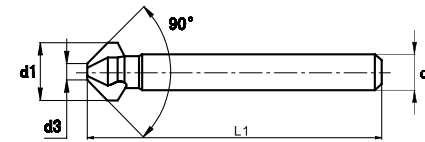
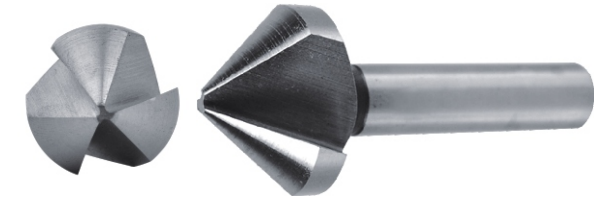


DIN 335
Form C
HSS
90°
3 Flutes
Shank Flats

Max $\phi$ d1 mm	Min $\phi$ d3 mm	Overall Length L1 mm	Shank $\phi$ d2 mm	Shiny Order Number <span>HSS</span>	TiN Coated Order Number <span>HSS TiN</span>	TiAlN Coated Order Number <span>HSS TiAlN</span>
4.3	1.3	40	4	14DC00027	14DC00001	14DC00116
4.8	1.5	40	4	14DC00112	14DC00114	14DC00117
5.0	1.5	40	4	14DC00028	14DC00002	14DC00118
5.3	1.5	40	4	14DC00029	14DC00003	14DC00119
5.8	1.5	45	5	14DC00030	14DC00004	14DC00120
6.0	1.5	45	5	14DC00031	14DC00005	14DC00121
6.3	1.5	45	5	14DC00032	14DC00006	14DC00122
7.0	1.8	50	6	14DC00033	14DC00007	14DC00123
7.3	1.8	50	6	14DC00034	14DC00008	14DC00124
8.0	2.0	50	6	14DC00035	14DC00009	14DC00125
8.3	2.0	50	6	14DC00036	14DC00010	14DC00126
9.4	2.2	50	6	14DC00037	14DC00011	14DC00127
10.0	2.5	50	6	14DC00038	14DC00012	14DC00128
10.4	2.5	50	6	14DC00040	14DC00013	14DC00129
11.5	2.8	56	8	14DC00041	14DC00014	14DC00130
12.4	2.8	56	8	14DC00042	14DC00015	14DC00131
13.4	2.9	56	8	14DC00043	14DC00016	14DC00132
14.4	3.0	56	8	14DC00113	14DC00115	14DC00133
15.0	3.2	60	10	14DC00044	14DC00017	14DC00134
16.5	3.2	60	10	14DC00045	14DC00018	14DC00135

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**90° Three Flute Countersinks, Cylindrical Shank**  
Straight Flute Type



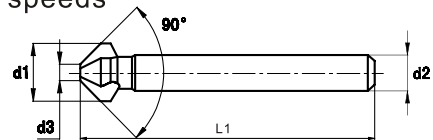
DIN 335
Form C
HSS
90°
3 Flutes
Shank Flats

Max $\phi$ d1 mm	Min $\phi$ d3 mm	Overall Length d1 mm	Shank $\phi$ d2 mm	Shiny Order Number <span>HSS</span>	TiN Coated Order Number <span>HSS TiN</span>	TiAlN Coated Order Number <span>HSS TiAlN</span>
19.0	3.5	63	10	14DC00046	14DC00019	14DC00136
20.5	3.5	63	10	14DC00047	14DC00020	14DC00137
23.0	3.8	67	10	14DC00048	14DC00021	14DC00138
25.0	3.8	67	10	14DC00049	14DC00022	14DC00139
26.0	3.8	67	10	14DC00050	14DC00023	14DC00140
28.0	4.0	71	12	14DC00051	14DC00024	14DC00141
30.0	4.2	71	12	14DC00052	14DC00025	14DC00142
31.0	4.2	71	12	14DC00053	14DC00026	14DC00143

Shank with 3 driving flats available as per requirements which enables effective holding.

### 90° Three Flute Countersinks, Cylindrical Shank Arc Flute Type

- ◆ CBN fully ground ensure better and sharper cutting edges
- ◆ Large and arc chip space allows faster and easier chip removal
- ◆ High positive cut, extra rake angle
- ◆ Constant profile relief
- ◆ Smooth low-heat running
- ◆ Considerably longer tool life
- ◆ Ideal centring features
- ◆ Scratch-free surface
- ◆ Applicable for steel, cast iron, non-ferrous and light metals. Best results at low cutting speeds

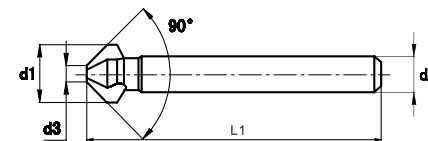


DIN 335
Form C
HSS
90°
Recycling
Shank

Max $\phi$ d1 mm	Min $\phi$ d3 mm	Overall Length L1 mm	Shank $\phi$ d2 mm	Shiny Order Number <small>HSS</small>	TiN Coated Order Number <small>HSS TiN</small>	TiAlN Coated Order Number <small>HSS TiAlN</small>
4.3	1.3	40	4	14DC00144	14DC00172	14DC00200
4.8	1.5	40	4	14DC00145	14DC00173	14DC00201
5.0	1.5	40	4	14DC00146	14DC00174	14DC00202
5.3	1.5	40	4	14DC00147	14DC00175	14DC00203
5.8	1.5	45	5	14DC00148	14DC00176	14DC00204
6.0	1.5	45	5	14DC00149	14DC00177	14DC00205
6.3	1.5	45	5	14DC00150	14DC00178	14DC00206
7.0	1.8	50	6	14DC00151	14DC00179	14DC00207
7.3	1.8	50	6	14DC00152	14DC00180	14DC00208
8.0	2.0	50	6	14DC00153	14DC00181	14DC00209
8.3	2.0	50	6	14DC00154	14DC00182	14DC00210
9.4	2.2	50	6	14DC00155	14DC00183	14DC00211
10.0	2.5	50	6	14DC00156	14DC00184	14DC00212
10.4	2.5	50	6	14DC00157	14DC00185	14DC00213
11.5	2.8	56	8	14DC00158	14DC00186	14DC00214
12.4	2.8	56	8	14DC00159	14DC00187	14DC00215
13.4	2.9	56	8	14DC00160	14DC00188	14DC00216
14.4	3.0	56	8	14DC00161	14DC00189	14DC00217

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### 90° Three Flute Countersinks, Cylindrical Shank Arc Flute Type



DIN 335
Form C
HSS
90°
Recycling
Shank

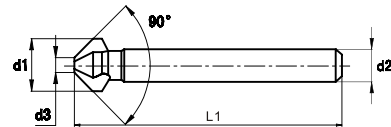
Max $\phi$ d1 mm	Min $\phi$ d3 mm	Overall Length L1 mm	Shank $\phi$ d2 mm	Shiny Order Number <small>HSS</small>	TiN Coated Order Number <small>HSS TiN</small>	TiAlN Coated Order Number <small>HSS TiAlN</small>
15.0	3.2	60	10	14DC00162	14DC00190	14DC00218
16.5	3.2	60	10	14DC00163	14DC00191	14DC00219
19.0	3.5	63	10	14DC00164	14DC00192	14DC00220
20.5	3.5	63	10	14DC00165	14DC00193	14DC00221
23.0	3.8	67	10	14DC00166	14DC00194	14DC00222
25.0	3.8	67	10	14DC00167	14DC00195	14DC00223
26.0	3.8	67	10	14DC00168	14DC00196	14DC00224
28.0	4.0	71	12	14DC00169	14DC00197	14DC00225
30.0	4.2	71	12	14DC00170	14DC00198	14DC00226
31.0	4.2	71	12	14DC00171	14DC00199	14DC00227

Shank with 3 driving flats available as per requirements which enables effective holding.



**90° Three Flute HSS-E Countersinks, Cylindrical Shank**  
Arc Flute Type

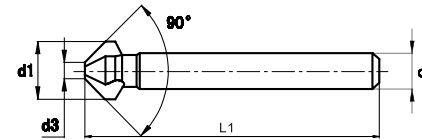
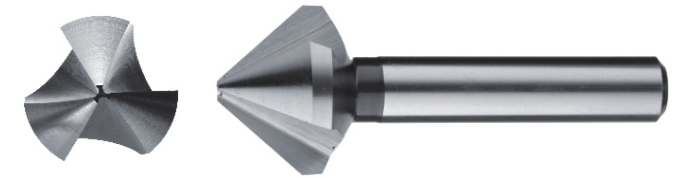
- ◆ CBN fully ground ensure better and sharper cutting edges
- ◆ Large and arc chip space allows faster and easier chip removal
- ◆ High positive cut, extra rake angle
- ◆ Constant profile relief
- ◆ Smooth low-heat running
- ◆ Considerably longer tool life
- ◆ Ideal centring features
- ◆ Scratch-free surface
- ◆ HSS-Co(Cobalt Hss) have higher red hardness permitting drilling of materials such as heat-resistant alloys and materials with hardness greater than 38HRC and high-alloyed chromium steel such as stainless and acidresistant steel



Max $\varnothing$ d1 mm	Min $\varnothing$ d3 mm	Overall Length L1 mm	Shank $\varnothing$ d2 mm	HSS-CO 5 Shiny Order Number <small>HSS-E</small>	HSS-CO 5 TiN Coated Order Number <small>HSS-E TiN</small>	HSS-CO 5 TiAlN Coated Order Number <small>HSS-E TiAlN</small>
4.3	1.3	40	4	14DC00228	14DC00252	14DC00269
4.8	1.5	40	4	14DC00229	14DC00253	14DC00270
5.0	1.5	40	4	14DC00230	14DC00254	14DC00271
5.3	1.5	40	4	14DC00231	14DC00255	14DC00272
5.8	1.5	45	5	14DC00232	14DC00256	14DC00273
6.0	1.5	45	5	14DC00233	14DC00257	14DC00274
6.3	1.5	45	5	14DC00098	14DC00076	14DC00275
7.0	1.8	50	6	14DC00234	14DC00258	14DC00276
7.3	1.8	50	6	14DC00235	14DC00259	14DC00277
8.0	2.0	50	6	14DC00236	14DC00260	14DC00278
8.3	2.0	50	6	14DC00099	14DC00107	14DC00279
9.4	2.2	50	6	14DC00237	14DC00261	14DC00280
10.0	2.5	50	6	14DC00238	14DC00262	14DC00281
10.4	2.5	50	6	14DC00100	14DC00083	14DC00282

Continued .....

**90° Three Flute HSS-E Countersinks, Cylindrical Shank**  
Arc Flute Type

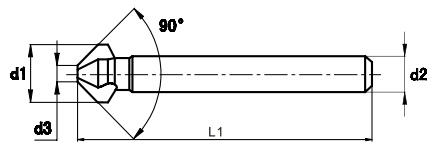


Max $\varnothing$ d1 mm	Min $\varnothing$ d3 mm	Overall Length L1 mm	Shank $\varnothing$ d2 mm	HSS-CO 5 Shiny Order Number <small>HSS-E</small>	HSS-CO 5 TiN Coated Order Number <small>HSS-E TiN</small>	HSS-CO 5 TiAlN Coated Order Number <small>HSS-E TiAlN</small>
11.5	2.8	56	8	14DC00239	14DC00263	14DC00283
12.4	2.8	56	8	14DC00101	14DC00264	14DC00284
13.4	2.9	56	8	14DC00240	14DC00265	14DC00285
14.4	3.0	56	8	14DC00241	14DC00266	14DC00286
15.0	3.2	60	10	14DC00242	14DC00055	14DC00287
16.5	3.2	60	10	14DC00243	14DC00056	14DC00288
19.0	3.5	63	10	14DC00244	14DC00057	14DC00289
20.5	3.5	63	10	14DC00245	14DC00058	14DC00290
23.0	3.8	67	10	14DC00246	14DC00059	14DC00291
25.0	3.8	67	10	14DC00247	14DC00060	14DC00292
26.0	3.8	67	10	14DC00248	14DC00267	14DC00293
28.0	4.0	71	12	14DC00249	14DC00062	14DC00294
30.0	4.2	71	12	14DC00250	14DC00268	14DC00295
31.0	4.2	71	12	14DC00251	14DC00097	14DC00296

Shank with 3 driving flats available as per requirements which enables effective holding.

**90° Three Flute Tungsten Carbide Countersinks, Cylindrical Shank**  
Arc Flute Type, Solid Carbide Head

- ◆ SDC Fully ground ensure better and sharper cutting edges
- ◆ Large and arc chip space allows faster and easier chip removal
- ◆ High positive cut, extra rake angle
- ◆ Constant profile relief
- ◆ Smooth low-heat running
- ◆ Considerably longer tool life
- ◆ Ideal centring features
- ◆ Scratch-free surface
- ◆ Applicable for a variety of metals and non-metallic, Ideal for Hardened heat-treated steels, exceeding 1200 N/mm<sup>2</sup> (> 38 HRC), Rust and acid-resistant steels, Hard non-ferrous metals

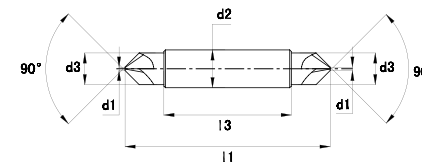


Max ø d1 mm	Min ø d3 mm	Overall Length L1 mm	Shank ø d2 mm	HM Shiny Order Number
6.3	1.5	45	5	14DC00297
8.3	2.0	50	6	14DC00298
10.4	2.5	50	6	14DC00299
12.4	2.8	56	8	14DC00300
16.5	3.2	60	10	14DC00301
20.5	3.5	63	10	14DC00302
25.0	3.8	67	10	14DC00303
31.0	4.2	71	12	14DC00304

Shank with 3 driving flats available as per requirements which enables effective holding.

**90° Three Flute Solid Carbide Countersinks Double Ended**  
Arc Flute Type, Solid Carbide

- ◆ SDC Fully ground ensure better and sharper cutting edges
- ◆ Grooves opened wide to allow chips away out
- ◆ High positive cut, extra rake angle
- ◆ Constant profile relief
- ◆ Smooth low-heat running
- ◆ Considerably longer tool life
- ◆ Ideal centring features
- ◆ Scratch-free surface
- ◆ Applicable for a variety of metals and non-metallic, Ideal for Hardened heat-treated steels, exceeding 1200 N/mm<sup>2</sup> (> 38 HRC), Rust and acid-resistant steels, Hard non-ferrous metals

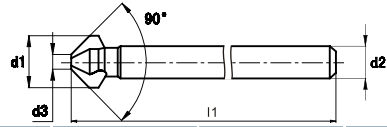
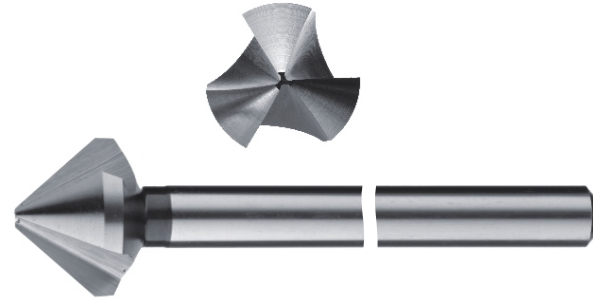


Max ø d1 mm	Min ø d3 mm	Overall Length l1 mm	Shank ø d2 mm	Shank Length ø l3 mm	HM Shiny Order Number
8.3	2.0	67	10	46	14DC00305
10.4	2.5	74	12	47	14DC00306
12.4	2.8	76	14	45	14DC00307



**90° Three Flute Countersinks, Long Cylindrical Shank**  
Arc Flute Type

- ◆ CBN fully ground ensure better and sharper cutting edges
- ◆ Large and arc chip space allows faster and easier chip removal
- ◆ High positive cut, extra rake angle
- ◆ Constant profile relief
- ◆ Smooth low-heat running
- ◆ Considerably longer tool life
- ◆ Ideal centring features
- ◆ Scratch-free surface
- ◆ Applicable for steel, cast iron, non-ferrous and light metals.
- ◆ Best results at low cutting speeds



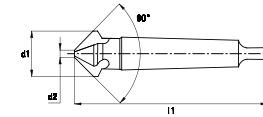
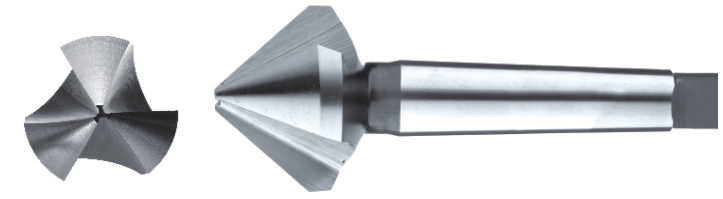
DIN 335
Form C
HSS
90°
↻
🔧

Max $\varnothing$ d1 mm	Min $\varnothing$ d3 mm	Overall Length l1 mm	Shank $\varnothing$ d2 mm	HSS Shiny Order Number <span>HSS</span>
6.3	1.5	85	5.0	14DC00308
8.3	2.0	85	6.0	14DC00309
10.4	2.5	88	6.0	14DC00310
12.4	2.8	108	8.0	14DC00311
15.0	3.2	110	10.0	14DC00312
16.5	3.2	112	10.0	14DC00313
20.5	3.5	115	10.0	14DC00314
25.0	3.8	118	10.0	14DC00315

HSS-E / TiN / TiAlN are available according to requirements

**90° Three Flute Countersinks, Morse Taper Shank**  
Arc Flute Type

- ◆ CBN fully ground ensure better and sharper cutting edges
- ◆ Large and arc chip space allows faster and easier chip removal
- ◆ High positive cut, extra rake angle
- ◆ Constant profile relief
- ◆ Smooth low-heat running
- ◆ Considerably longer tool life
- ◆ Ideal centring features
- ◆ Scratch-free surface
- ◆ Applicable for steel, cast iron, non-ferrous and light metals.
- ◆ Best results at low cutting speeds



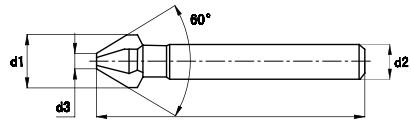
DIN 335
Form D
HSS
90°
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Max $\varnothing$ d1 mm	Min $\varnothing$ d3 mm	Overall Length l1 mm	Morse Taper No.	HSS Shiny Order Number <span>HSS</span>	TiN Coated Order Number <span>HSS TiN</span>	TiAlN Coated Order Number <span>HSS TiAlN</span>
15.0	3.2	85	1	14DB00001	14DB00017	14DB00033
16.5	3.2	85	1	14DB00002	14DB00018	14DB00034
19.0	3.5	100	2	14DB00003	14DB00019	14DB00035
20.5	3.5	100	2	14DB00004	14DB00020	14DB00036
23.0	3.8	106	2	14DB00005	14DB00021	14DB00037
25.0	3.8	103	2	14DB00006	14DB00022	14DB00038
26.0	3.8	103	2	14DB00007	14DB00023	14DB00039
28.0	4.0	112	2	14DB00008	14DB00024	14DB00040
30.0	4.2	112	2	14DB00009	14DB00025	14DB00041
31.0	4.2	112	2	14DB00010	14DB00026	14DB00042
34.0	4.5	118	2	14DB00011	14DB00027	14DB00043
37.0	4.8	118	2	14DB00012	14DB00028	14DB00044
40.0	10.0	140	3	14DB00013	14DB00029	14DB00045
50.0	14.0	150	3	14DB00014	14DB00030	14DB00046
63.0	16.0	180	4	14DB00015	14DB00031	14DB00047
80.0	22.0	190	4	14DB00016	14DB00032	14DB00048

HSS-E HSS-Co(Cobalt HSS) available as per requirements.

**60° Three Flute Countersinks, Straight Shank**  
Arc Flute Type

- ◆ CBN fully ground ensure better and sharper cutting edges
- ◆ Large and arc chip space allows faster and easier chip removal
- ◆ High positive cut, extra rake angle
- ◆ Constant profile relief
- ◆ Smooth low-heat running
- ◆ Considerably longer tool life
- ◆ Ideal centring features
- ◆ Scratch-free surface
- ◆ Applicable for steel, cast iron, non-ferrous and light metals.
- ◆ Best results at low cutting speeds

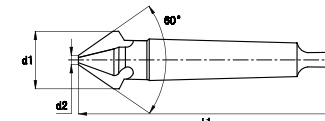
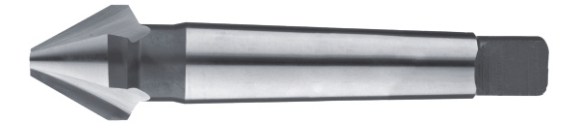


Max $\varnothing$ d1 mm	Min $\varnothing$ d3 mm	Overall Length l1 mm	Shank $\varnothing$ d2 mm	HSS Shiny Order Number
6.3	1.6	45	5	14DC00316
8.0	2.0	50	6	14DC00317
10.0	2.5	50	6	14DC00318
12.5	3.2	56	8	14DC00319
16.0	4.0	63	10	14DC00320
20.0	5.0	67	10	14DC00321
22.5	5.6	71	10	14DC00322
25.0	6.3	71	10	14DC00323

/ / / are available according to requirements

**60° Three Flute Countersinks, Morse Taper Shank**  
Arc Flute Type

- ◆ CBN fully ground ensure better and sharper cutting edges
- ◆ Large and arc chip space allows faster and easier chip removal
- ◆ High positive cut, extra rake angle
- ◆ Constant profile relief
- ◆ Smooth low-heat running
- ◆ Considerably longer tool life
- ◆ Ideal centring features
- ◆ Scratch-free surface
- ◆ Applicable for steel, cast iron, non-ferrous and light metals
- ◆ Best results at low cutting speeds



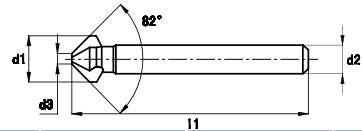
Max $\varnothing$ d1 mm	Min $\varnothing$ d3 mm	Overall Length l1 mm	Morse Taper No.	HSS Shiny Order Number
16.0	4.0	90	1	14DB00049
20.0	5.0	106	2	14DB00050
25.0	6.3	112	2	14DB00051
31.5	10.0	118	2	14DB00052
40.0	12.5	150	3	14DB00053
50.0	16.0	160	3	14DB00054
63.0	20.0	190	4	14DB00055
80.0	25.0	200	4	14DB00056

/ / are available according to requirements



**82° Three Flute Countersinks, Straight Shank**  
Arc Flute Type

- ◆ CBN fully ground ensure better and sharper cutting edges
- ◆ Large and arc chip space allows faster and easier chip removal
- ◆ High positive cut, extra rake angle
- ◆ Constant profile relief
- ◆ Smooth low-heat running
- ◆ Considerably longer tool life
- ◆ Ideal centring features
- ◆ Scratch-free surface
- ◆ Applicable for steel, cast iron, non-ferrous and light metals.
- ◆ Best results at low cutting speeds



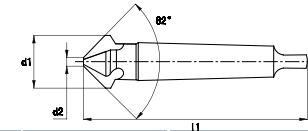
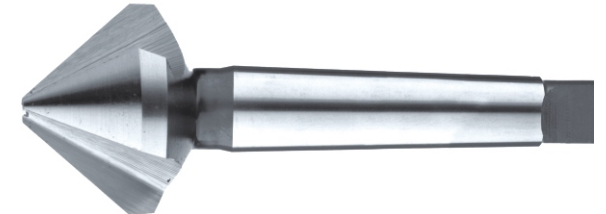
DIN 335
Form C
HSS
82°
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Image Icon

Max $\varnothing$ d1 mm	Min $\varnothing$ d3 mm	Overall Length l1 mm	Shank $\varnothing$ d2 mm	HSS Shiny Order Number <span>HSS</span>
6.3	1.5	45	5	14DC00340
8.3	2.0	50	6	14DC00341
10.4	2.5	50	6	14DC00342
12.4	2.8	56	8	14DC00343
16.5	3.2	60	10	14DC00344
20.5	3.5	63	10	14DC00345
25.0	3.8	67	10	14DC00346

HSS-E / TIN / TAIN / Image Icon are available according to requirements

**82° Three Flute Countersinks, Morse Taper Shank**  
Arc Flute Type

- ◆ CBN fully ground ensure better and sharper cutting edges
- ◆ Large and arc chip space allows faster and easier chip removal
- ◆ High positive cut, extra rake angle
- ◆ Constant profile relief
- ◆ Smooth low-heat running
- ◆ Considerably longer tool life
- ◆ Ideal centring features
- ◆ Scratch-free surface
- ◆ Applicable for steel, cast iron, non-ferrous and light metals.
- ◆ Best results at low cutting speeds



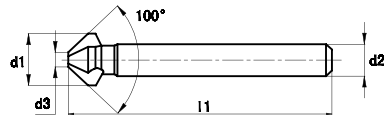
DIN 335
Form D
HSS
82°
C
Image Icon

Max $\varnothing$ d1 mm	Min $\varnothing$ d3 mm	Overall Length l1 mm	Morse Taper No.	HSS Shiny Order Number <span>HSS</span>
16.5	3.2	85	1	14DB00073
20.5	3.5	100	2	14DB00074
25.0	3.8	106	2	14DB00075
31.0	4.2	112	2	14DB00076
40.0	10.0	140	3	14DB00077
50.0	14.0	150	3	14DB00078
63.0	16.0	180	4	14DB00079
80.0	22.0	190	4	14DB00080

HSS-E / TIN / TAIN are available according to requirements

### 100° Three Flute Countersinks, Straight Shank Arc Flute Type

- ◆ CBN fully ground ensure better and sharper cutting edges
- ◆ Large and arc chip space allows faster and easier chip removal
- ◆ High positive cut, extra rake angle
- ◆ Constant profile relief
- ◆ Smooth low-heat running
- ◆ Considerably longer tool life
- ◆ Ideal centring features
- ◆ Scratch-free surface
- ◆ Applicable for steel, cast iron, non-ferrous and light metals.
- ◆ Best results at low cutting speeds



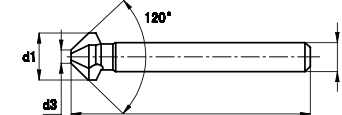
DIN 335
Form C
HSS
100°
↻
🔧

Max ø d1 mm	Min ø d3 mm	Overall Length l1 mm	Shank ø d2 mm	HSS Shiny Order Number <span>HSS</span>
6.3	1.5	44	5.0	14DC00347
8.3	2.0	49	6.0	14DC00348
10.4	2.5	49	6.0	14DC00349
12.4	2.8	53	6.0	14DC00350
16.5	3.2	56	6.0	14DC00351
20.5	3.5	61	10.0	14DC00352
25.0	3.8	65	10.0	14DC00353

HSS-E / TiN / TiAlN / 🔧 are available according to requirements

### 120° Three Flute Countersinks, Straight Shank Arc Flute Type

- ◆ CBN fully ground ensure better and sharper cutting edges
- ◆ Large and arc chip space allows faster and easier chip removal
- ◆ High positive cut, extra rake angle
- ◆ Constant profile relief
- ◆ Smooth low-heat running
- ◆ Considerably longer tool life
- ◆ Ideal centring features
- ◆ Scratch-free surface
- ◆ Applicable for steel, cast iron, non-ferrous and light metals.
- ◆ Best results at low cutting speeds



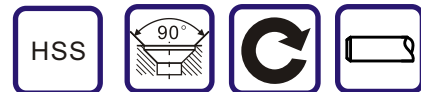
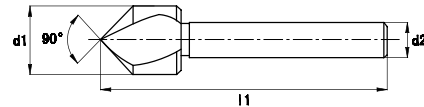
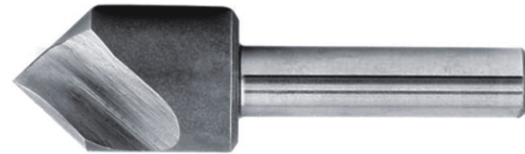
DIN 347
Form C
HSS
120°
↻
🔧

Max ø d1 mm	Min ø d3 mm	Overall Length l1 mm	Shank ø d2 mm	HSS Shiny Order Number <span>HSS</span>
6.3	1.5	49	5.0	14DC00354
8.0	2.0	49	6.0	14DC00355
12.5	2.8	54	8.0	14DC00356
14.4	2.0	57	8.0	14DC00357
16.0	3.2	57	10.0	14DC00358
20.0	3.5	59	10.0	14DC00359
25.0	3.8	63	10.0	14DC00360

HSS-E / TiN / TiAlN / 🔧 are available according to requirements

**90° Single Flute Countersinks, Cylindrical Shank**  
Sharp Point

- ◆ CBN fully ground ensure better and sharper cutting edges
- ◆ Large and arc chip space allows faster and easier chip removal
- ◆ High positive cut, extra rake angle
- ◆ Constant profile relief
- ◆ Smooth low-heat running
- ◆ Ideal centring features
- ◆ Ideal true roundness
- ◆ Scratch-free surface
- ◆ Applicable for steel, cast iron, non-ferrous and light metals.
- ◆ Best results at low cutting speeds

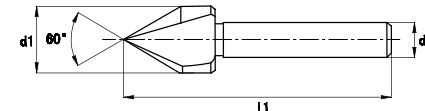


Max $\varnothing$ d1 mm	Overall Length l1 mm	Shank $\varnothing$ d2 mm	HSS Shiny Order Number <span style="border: 1px solid black; padding: 2px;">HSS</span>
6.0	45	6.0	14DC00361
8.0	50	8.0	14DC00362
10.0	49	8.0	14DC00363
12.5	49	8.0	14DC00364
16.0	56	10.0	14DC00365
20.0	60	10.0	14DC00366
25.0	75	12.0	14DC00367
31.5	80	12.0	14DC00368

HSS-E / TiN / TiAlN / are available according to requirements

**60° Single Flute Countersinks, Cylindrical Shank**  
Sharp Point

- ◆ CBN fully ground ensure better and sharper cutting edges
- ◆ Large and arc chip space allows faster and easier chip removal
- ◆ High positive cut, extra rake angle
- ◆ Constant profile relief
- ◆ Smooth low-heat running
- ◆ Ideal centring features
- ◆ Ideal true roundness
- ◆ Scratch-free surface
- ◆ Applicable for steel, cast iron, non-ferrous and light metals.
- ◆ Best results at low cutting speeds



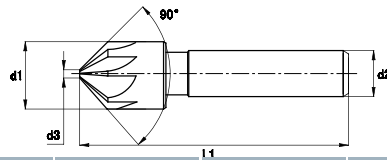
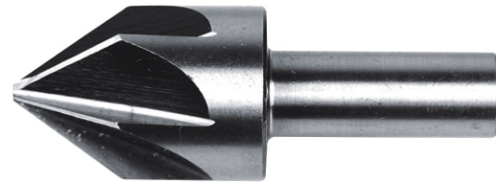
Max $\varnothing$ d1 mm	Overall Length l1 mm	Shank $\varnothing$ d2 mm	HSS Shiny Order Number <span style="border: 1px solid black; padding: 2px;">HSS</span>
6.0	45	6	14DC00369
8.0	50	8	14DC00370
10.0	52	8	14DC00371
12.5	52	8	14DC00372
16.0	60	10	14DC00373
20.0	63	10	14DC00374
25.0	82	12	14DC00375
31.5	90	12	14DC00376

HSS-E / TiN / TiAlN / are available according to requirements



**90° Multi Flute Countersinks, Cylindrical Shank**

- ◆ CBN ground ensure better cutting edges
- ◆ Multi Grooves to allow chips away out
- ◆ Positive cut, Standard rake angle
- ◆ Standard profile relief
- ◆ Smooth low-heat running
- ◆ Ideal centring features
- ◆ Scratch-free surface
- ◆ Applicable for machining of materials with tensile strength > 1000N/mm<sup>2</sup>

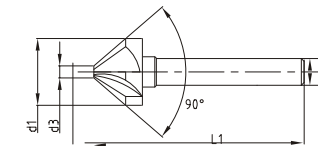


DIN 335
Form A
HSS
90°
C
Image Icon

Max ø d1 mm	Min ø d3 mm	Overall Length L1 mm	Shank ø d2 mm	No. of Flute Z	HSS Shiny Order Number <span>HSS</span>
8.0	N/A	48	8	5	14DC00377
12.5	2.0	48	8	5	14DC00378
16.0	3.2	56	10	7	14DC00379
20.0	5.0	60	10	7	14DC00380

HSS-E / Image Icon are available according to requirements

**90° Multi Flute Countersinks, Cylindrical Shank  
Rose Pattern**



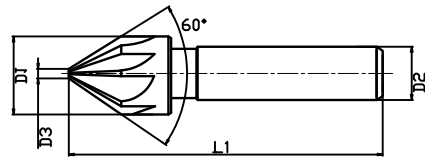
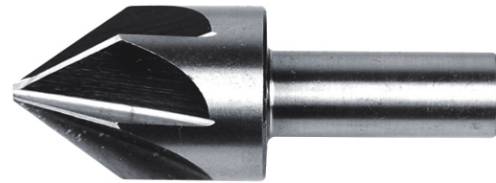
HSS
90°
C
Image Icon

Max ø d1 mm	Min ø d3 mm	Overall Length L1 mm	Shank ø d2 mm	No. of Flute Z	HSS Shiny Order Number <span>HSS</span>
3/8"	N/A	2"	3/16"	7	14DC00396
1/2"	5/64"	2"	3/16"	7	14DC00397
5/8"	1/8"	2"	1/4"	7	14DC00398

HSS-E / Image Icon are available according to requirements

### 60° Multi Flute Countersinks, Cylindrical Shank

- ◆ CBN ground ensure better cutting edges
- ◆ Multi Grooves to allow chips away out
- ◆ Positive cut, Standard rake angle
- ◆ Standard profile relief
- ◆ Smooth low-heat running
- ◆ Ideal centring features
- ◆ Scratch-free surface
- ◆ Applicable for machining of materials with tensile strength > 1000 N/mm<sup>2</sup>



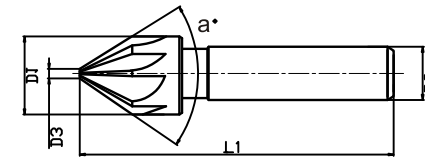
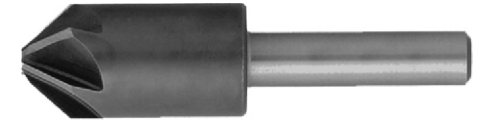
Max $\phi$ D1 mm	Min $\phi$ D3 mm	Overall Length L1 mm	Shank $\phi$ D2 mm	No. of Flute Z	HSS Shiny Order Number <span style="border: 1px solid black; padding: 2px;">HSS</span>
8.0	N/A	50	8	5	14DC00381
12.5	2.0	50	8	5	14DC00382
16.0	3.2	60	10	7	14DC00383
20.0	5.0	63	10	7	14DC00384

HSS-E / are available according to requirements

1/2

### Six Flute Countersinks, Cylindrical Shank American Type

- ◆ Milled and precision ground ensure good cutting edges
- ◆ Six Grooves to allow chips away out
- ◆ Positive cut, Standard rake angle
- ◆ Standard profile relief
- ◆ Smooth low-heat running
- ◆ Ideal centring features
- ◆ Scratch-free surface
- ◆ Applicable for any machinable material including iron, steel, soft metals, plastics or wood

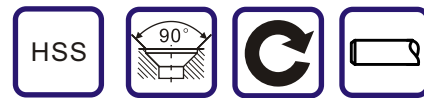
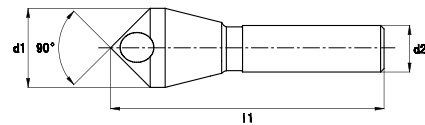


Cutting Dia. $\phi$ D1 Inch	Shank Dia. $\phi$ D2 Inch	Shank Length L1 Inch	Overall Length $\phi$ L2 Inch	Inclusive Angle a°		
				60° Order Number	82° Order Number	90° Order Number
1/8"	1/8"	1 5/8"	1 5/8"	14DC00399	14DC00413	14DC00427
3/16"	3/16"	1 1/2"	1 1/2"	14DC00400	14DC00414	14DC00428
1/4"	3/16"	3/4"	1 1/2"	14DC00401	14DC00415	14DC00429
5/16"	1/4"	7/8"	1 3/4"	14DC00402	14DC00416	14DC00430
3/8"	1/4"	7/8"	1 3/4"	14DC00403	14DC00417	14DC00431
1/2"	3/8"	1 1/8"	2 1/8"	14DC00404	14DC00418	14DC00432
5/8"	3/8"	1 1/8"	2 3/8"	14DC00405	14DC00419	14DC00433
3/4"	1/2"	1 5/16"	2 11/16"	14DC00406	14DC00420	14DC00434
7/8"	1/2"	1 5/16"	2 13/16"	14DC00407	14DC00421	14DC00435
1"	1/2"	1 5/16"	2 13/16"	14DC00408	14DC00422	14DC00436
1 1/4"	3/4"	1 5/8"	3 3/8"	14DC00409	14DC00423	14DC00437
1 1/2"	3/4"	1 5/8"	3 1/2"	14DC00410	14DC00424	14DC00438
1 3/4"	1"	2 1/8"	4 1/4"	14DC00411	14DC00425	14DC00439
2"	1"	2 1/8"	4 3/8"	14DC00412	14DC00426	14DC00440

HSS-E HSS-Co(Cobalt HSS) available as per requirements.

**90° Zero Flute Deburring Countersinks, Cylindrical Shank**  
Metric Size

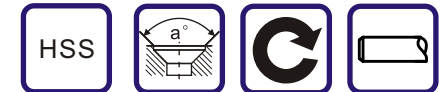
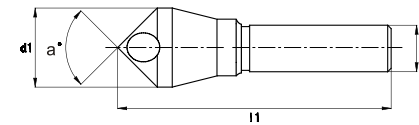
- ◆ CBN ground ensure better and sharper cutting edges
- ◆ Single hole to allow faster and easier chips away out
- ◆ High Positive cut
- ◆ Constant profile relief
- ◆ Smooth running
- ◆ Ideal centring features
- ◆ Ideal true roundness
- ◆ Scratch-free surface
- ◆ Easily resharpened by the use of a small mounted grinding stone inserted into the hole
- ◆ Applicable for machining light metals and plastics



Countersinker Max ø d1 mm	Countersinker Min ø d3 mm	Overall Length l1 mm	Head Max ø d1 mm	Shank ø D2 mm	HSS Shiny Order Number	TiN Coated Order Number
5	2	45	10	6	14DA00009	14DA00044
10	5	48	14	8	14DA00015	14DA00046
15	10	65	21	10	14DA00001	14DA00048
20	15	85	28	12	14DA00005	14DA00050
25	20	102	35	15	14DA00007	14DA00052
30	25	115	44	15	14DA00011	14DA00054
35	30	127	48	15	14DA00013	14DA00056
40	35	136	53	15	14DA00017	14DA00058
50	40	166	60	20	14DA00019	14DA00060

/ are available according to requirements

**Zero Flute Deburring Countersinks, Cylindrical Shank**  
Imperial Size, Including 60° 82° 90° Point Angle



Size No.	Countersinker Max ø d1 inch	Countersinker Min ø d3 inch	Overall Length l1 inch	Head Max ø d inch	Shank ø d2 inch	Point Angle α°	HSS Shiny Order Number	TiN Coated Order Number
0#	15/64"	1/16"	1-29/32"	1/4"	1/4"	60°	14DA00062	14DA00071
1#	13/32"	5/32"	1-27/32"	7/16"	1/4"	60°	14DA00063	14DA00072
2#	17/32"	3/16"	2-3/32"	9/16"	1/4"	60°	14DA00064	14DA00073
3#	25/32"	5/16"	2-3/4"	13/16"	1/2"	60°	14DA00065	14DA00074
4#	1-1/16"	9/16"	3"	1-1/8"	1/2"	60°	14DA00066	14DA00075
0#	15/64"	1/16"	1-29/32"	1/4"	1/4"	82°	14DA00022	14DA00080
1#	13/32"	5/32"	1-3/4"	7/16"	1/4"	82°	14DA00023	14DA00081
2#	17/32"	3/16"	2-1/32"	9/16"	1/4"	82°	14DA00024	14DA00082
3#	25/32"	5/16"	2-23/32"	13/16"	1/2"	82°	14DA00025	14DA00083
4#	1-1/16"	9/16"	3"	1-1/8"	1/2"	82°	14DA00026	14DA00084
5#	1-15/32"	5/8"	3-15/16"	1-1/2"	1/2"	82°	14DA00027	14DA00085
6#	1-3/4"	3/4"	5-1/8"	1-25/32"	5/8"	82°	14DA00028	14DA00086
7#	2"	1"	5-9/32"	2-1/32"	5/8"	82°	14DA00029	14DA00087
8#	2-1/2"	1-1/4"	6"	2-17/32"	3/4"	82°	14DA00030	14DA00088
0#	15/64"	1/16"	1-29/32"	1/4"	1/4"	90°	14DA00031	14DA00089
1#	13/32"	5/32"	1-3/4"	7/16"	1/4"	90°	14DA00032	14DA00090
2#	17/32"	3/16"	2-1/32"	9/16"	1/4"	90°	14DA00033	14DA00091
3#	25/32"	5/16"	2-23/32"	13/16"	1/2"	90°	14DA00034	14DA00092
4#	1-1/16"	9/16"	3"	1-1/8"	1/2"	90°	14DA00035	14DA00093

★ Also Available in 100° and 120° point angle

/ are available according to requirements

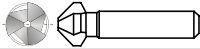
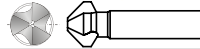


**5pcs 90° Three Flute Countersinks Sets, Cylindrical shank**

**In Plastic Box**

- ◆ Group of 5 pcs common size for general applications
- ◆ Plastic box with stand packaging protects cutting edges and convenient for picking and storage




Max $\phi$ d1 mm	Min $\phi$ d3 mm	Overall Length l1 mm	Shank $\phi$ d2 mm	 <b>Straight Flute</b> HSS Shiny Order Number	 <b>Arc Flute</b> HSS Shiny Order Number
6.4	1.5	45	5		
10.5	2.5	50	6		
12.4	2.8	56	8	27AE00011	27AE00006
16.5	3.2	60	10		
20.5	3.5	63	10		





**4pc 90° Zero Flute Deburring Countersinks Sets, Cylindrical shank**

**In Metal Box**

- ◆ Group of 4 pcs common size for general applications
- ◆ Metal Box with stand packing protects cutting edges and convenient for packing and storage

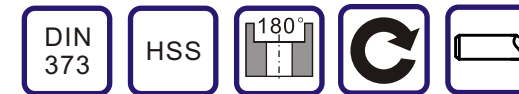
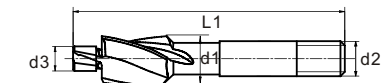
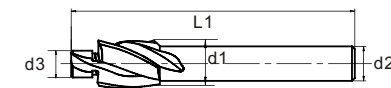


Size mm	Head diam mm	Shank mm	Overall Length mm	 HSS Shiny Order Number
2-5	10.0	6	45	
5-10	14.0	6	48	
10-15	21.0	8	65	27AE00007
15-20	28.0	10	85	

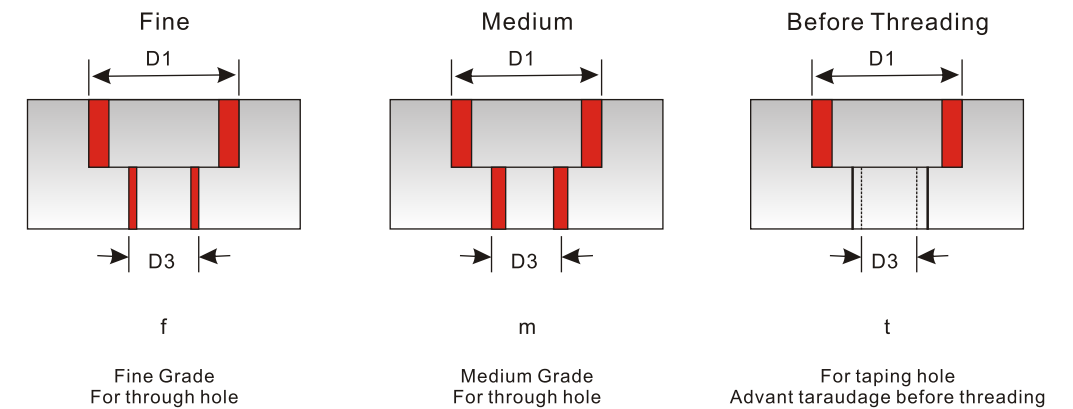
 /  /  /  are available according to requirements

**180° Three Flute Hss Counterbores With Solid Pilot**  
Spiral Flute Type

- ◆ Used for milling of pre-drilled holes to allow bolts or cup head screws to lie flush with the component surface
- ◆ Spiral flutes guarantee completely smooth running and high cutting performance
- ◆ Large and Spiral chip space allows faster and easier chip removal
- ◆ Longer tool life compared with straight flute type

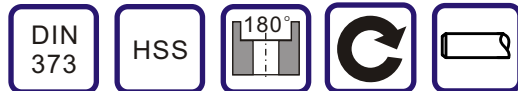


**3 Different Adjustment Series**



### 180° Three Flute Hss Counterbores With Solid Pilot Spiral Flute Type

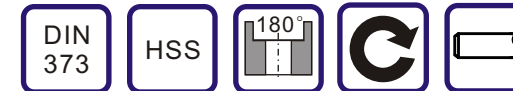
#### Counterbores for through hole fine grade (f)



Bolt Thread	Cutter Dia. D1 mm	Pilot Dia. D3 mm	Shank Dia. D2 mm	Overall Length L1 mm	Cylindrical Shank		Threaded Shank	
					HSS Shiny Order Number	HSS	HSS Shiny Order Number	HSS
M3	6.0	3.2	5.0	71.0	14DD00013		14DD00021	
M4	8.0	4.3	5.0	71.0	14DD00014		14DD00022	
M5	10.0	5.3	8.0	80.0	14DD00015		14DD00023	
M6	11.0	6.4	8.0	80.0	14DD00016		14DD00024	
M8	15.0	8.4	12.5	100.0	14DD00017		14DD00025	
M10	18.0	10.5	12.5	100.0	14DD00018		14DD00026	
M12	20.0	13.0	12.5	100.0	14DD00019		14DD00027	
M16	26.0	17.0	16.0	100.0	14DD00020		14DD00028	

### 180° Three Flute Hss Counterbores With Solid Pilot Spiral Flute Type

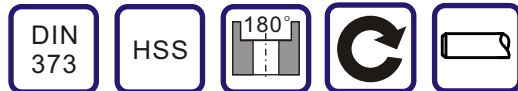
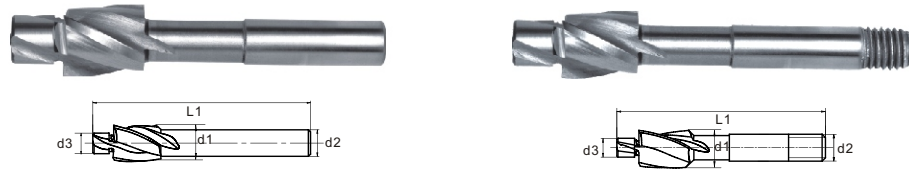
#### Counterbores for tapping hole (t)



Bolt Thread	Cutter Dia. D1 mm	Pilot Dia. D3 mm	Shank Dia. D2 mm	Overall Length L1 mm	Cylindrical Shank		Threaded Shank	
					HSS Shiny Order Number	HSS	HSS Shiny Order Number	HSS
M3	6.0	2.5	5.0	71.0	14DD00045		14DD00053	
M4	8.0	3.3	5.0	71.0	14DD00046		14DD00054	
M5	10.0	4.2	8.0	80.0	14DD00047		14DD00055	
M6	11.0	5.0	8.0	80.0	14DD00048		14DD00056	
M8	15.0	6.8	12.5	100.0	14DD00049		14DD00057	
M10	18.0	8.5	12.5	100.0	14DD00050		14DD00058	
M12	20.0	10.2	12.5	100.0	14DD00051		14DD00059	
M16	26.0	14.0	16.0	100.0	14DD00052		14DD00060	

/ are available according to requirements

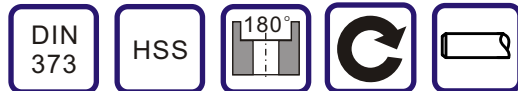
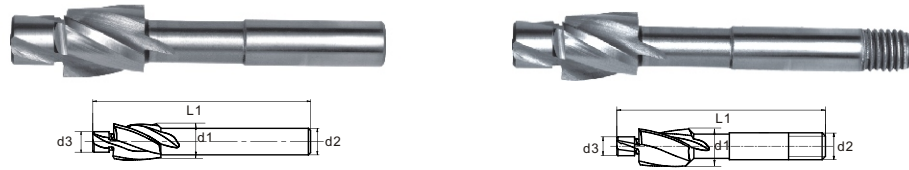
#### Counterbores for through hole medium grade (m)



Bolt Thread	Cutter Dia. D1 mm	Pilot Dia. D3 mm	Shank Dia. D2 mm	Overall Length L1 mm	Cylindrical Shank		Threaded Shank	
					HSS Shiny Order Number	HSS	HSS Shiny Order Number	HSS
M3	6.0	3.4	5.0	71.0	14DD00029		14DD00037	
M4	8.0	4.5	5.0	71.0	14DD00030		14DD00038	
M5	10.0	5.5	8.0	80.0	14DD00031		14DD00039	
M6	11.0	6.6	8.0	80.0	14DD00032		14DD00040	
M8	15.0	9.0	12.5	100.0	14DD00033		14DD00041	
M10	18.0	11.0	12.5	100.0	14DD00034		14DD00042	
M12	20.0	13.5	12.5	100.0	14DD00035		14DD00043	
M16	26.0	18.0	16.0	100.0	14DD00036		14DD00044	

**180° Three Flute Hss Counterbores With Solid Pilot, Straight Shank**  
Spiral Flute Type

Imperial Size

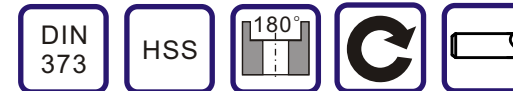
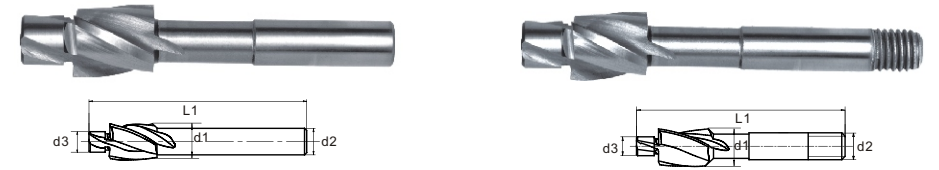


US Screw Sizes	Cutter Dia. D1 inch	Pilot Dia. D3 inch	Shank Dia. D2 inch	Overall Length L1 inch	Cylindrical Shank		Threaded Shank	
					HSS Shiny Order Number	HSS	HSS Shiny Order Number	HSS
6#	0.23	0.135	7/32"	3"	14DD00061		14DD00092	
6#	0.242	0.150	7/32"	3"	14DD00062		14DD00093	
8#	0.274	0.161	1/4"	3"	14DD00063		14DD00094	
8#	0.286	0.178	1/4"	3"	14DD00064		14DD00095	
10#	0.316	0.187	5/16"	3 1/2"	14DD00065		14DD00096	
10#	0.328	0.204	5/16"	3 1/2"	14DD00066		14DD00097	
12#	0.348	0.213	11/32"	3 1/2"	14DD00067		14DD00098	
12#	0.360	0.229	11/32"	3 1/2"	14DD00068		14DD00099	
1/4"	3/8"	1/4"	3/8"	5 3/4"	14DD00069		14DD00100	
1/4"	25/64"	17/64"	3/8"	5 3/4"	14DD00070		14DD00101	
1/4"	13/32"	9/32"	3/8"	5 3/4"	14DD00071		14DD00102	
5/16"	7/16"	5/16"	7/16"	6"	14DD00072		14DD00103	
5/16"	29/64"	21/64"	7/16"	6"	14DD00073		14DD00104	
5/16"	15/32"	11/32"	7/16"	6"	14DD00074		14DD00105	
3/8"	9/16"	3/8"	1/2"	6 1/2"	14DD00075		14DD00106	
3/8"	37/64"	25/64"	1/2"	6 1/2"	14DD00076		14DD00107	
3/8"	19/32"	13/32"	1/2"	6 1/2"	14DD00077		14DD00108	
7/16"	5/8"	7/16"	1/2"	7"	14DD00078		14DD00109	
7/16"	41/64"	29/64"	1/2"	7"	14DD00079		14DD00110	
7/16"	21/32"	15/32"	1/2"	7"	14DD00080		14DD00111	
1/2"	3/4"	1/2"	1/2"	7 1/4"	14DD00081		14DD00112	
1/2"	49/64"	33/64"	1/2"	7 1/4"	14DD00082		14DD00113	
1/2"	25/32"	17/32"	1/2"	7 1/4"	14DD00083		14DD00114	
9/16"	13/16"	9/16"	3/4"	7 1/2"	14DD00084		14DD00115	

Continued .....

**180° Three Flute Hss Counterbores With Solid Pilot, Straight Shank**  
Spiral Flute Type

Imperial Size



US Screw Sizes	Cutter Dia. D1 inch	Pilot Dia. D3 inch	Shank Dia. D2 inch	Overall Length L1 inch	Cylindrical Shank		Threaded Shank	
					HSS Shiny Order Number	HSS	HSS Shiny Order Number	HSS
9/16"	27/32"	19/32"	3/4"	7 1/2"	14DD00085		14DD00116	
5/8"	7/8"	5/8"	3/4"	8 1/4"	14DD00086		14DD00117	
5/8"	29/32"	21/32"	3/4"	8 1/4"	14DD00087		14DD00118	
5/8"	15/16"	11/16"	3/4"	8 1/4"	14DD00088		14DD00119	
3/4"	1"	3/4"	1"	8 13/16"	14DD00089		14DD00120	
3/4"	1 1/32"	25/32"	1"	8 13/16"	14DD00090		14DD00121	
3/4"	1 1/16"	13/16"	1"	8 13/16"	14DD00091		14DD00122	

For 1960 Series Capscrew

5/16"	15/32"	5/16"	7/16"	6"	14DD00123		14DD00137	
5/16"	31/64"	21/64"	7/16"	6"	14DD00124		14DD00138	
5/16"	1/2"	11/32"	7/16"	6"	14DD00125		14DD00139	
7/16"	21/32"	7/16"	1/2"	7"	14DD00126		14DD00140	
7/16"	43/64"	29/64"	1/2"	7"	14DD00127		14DD00141	
7/16"	11/16"	15/32"	1/2"	7"	14DD00128		14DD00142	
5/8"	15/16"	5/8"	3/4"	8 1/4"	14DD00129		14DD00143	
5/8"	31/32"	21/32"	3/4"	8 1/4"	14DD00130		14DD00144	
5/8"	1"	11/16"	3/4"	8 1/4"	14DD00131		14DD00145	
3/4"	1 1/8"	3/4"	1"	8 13/16"	14DD00132		14DD00146	
3/4"	1 5/32"	25/32"	1"	8 13/16"	14DD00133		14DD00147	
3/4"	1 3/16"	13/16"	1"	8 13/16"	14DD00134		14DD00148	
1"	1 1/2"	1"	1"	8 13/16"	14DD00135		14DD00149	
1"	1 9/16"	1 1/16"	1"	8 13/16"	14DD00136		14DD00150	

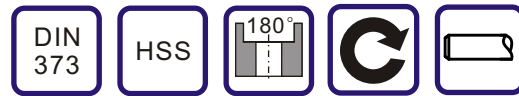
HSS-Co(Cobalt HSS) available as per requirements.



**7pcs 180° Three Flute Hss Counterbores With Solid Pilot Set, Cylindrical Shank  
Spiral Flute Type**

**In Plastic Box**

- ◆ Group of 7 pcs common size for general applications
- ◆ Plastic Box convenient for picking and storage



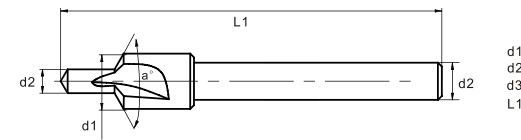
Contents				Fine Grade(f) HSS Shiny Order Number	Medium Grade(m) HSS Shiny Order Number	For Taping Hole(t) HSS Shiny Order Number
Bolt Thread	Cutter Dia.	Shank Dia.	Overall Length			
M3	6.0	5.0	71.0	27AE00008	27AE00009	27AE00010
M4	8.0	5.0	71.0			
M5	10.0	8.0	80.0			
M6	11.0	8.0	80.0			
M8	15.0	12.5	100.0			
M10	18.0	12.5	100.0			

HSS / TiN / are available according to requirements

Special kit contents can be modified.

**Three Flute Hss Piloted Countersinks, Straight Shank  
Spiral Flute Type**

- ◆ Used for the production of high precision concentrically centred countersinks in most metals where pilot holes have been pre-drilled
- ◆ CBN fully ground ensure better and sharper cutting edges
- ◆ Modified cutting angle guarantee smooth running and positive cut



Cutter Dia. D1 inch	Pilot Dia. D3 inch	Shank Dia. D2 inch	Overall Length L1 inch	Inclusive Angle a°		
				90° Order Number	100° Order Number	120° Order Number
3/16"	3/32"	3/16"	2 1/2"	14DD00151	14DD00161	14DD00171
1/4"	3/32"	3/16"	2 1/2"	14DD00152	14DD00162	14DD00172
1/4"	1/8"	3/16"	2 1/2"	14DD00153	14DD00163	14DD00173
5/16"	1/8"	3/16"	2 1/2"	14DD00154	14DD00164	14DD00174
5/16"	5/32"	3/16"	2 1/2"	14DD00155	14DD00165	14DD00175
3/8"	5/32"	3/16"	2 1/2"	14DD00156	14DD00166	14DD00176
3/8"	3/16"	3/16"	2 1/2"	14DD00157	14DD00167	14DD00177
7/16"	7/32"	3/16"	2 1/2"	14DD00158	14DD00168	14DD00178
7/16"	1/4"	3/16"	2 1/2"	14DD00159	14DD00169	14DD00179
1/2"	1/4"	3/16"	2 1/2"	14DD00160	14DD00170	14DD00180

HSS / TiN are available according to requirements

Center Drills:

Combined Drills and Countersinks, are mainly used for making the center hole on component, which is the base and support hole for the workpiece in mechanical procession, it is especially in turning procession. Center Drills can be also used for chamfering and countersinking.

Product Features :

- ◆ Made by High-performance HSS/Tungsten Carbide material, High wear resistance and long tool life ;
- ◆ Manufactured by advanced CNC machine. High consistency and quality assurance;
- ◆ CBN fully ground ensure better and sharper cutting edges
- ◆ Modified cutting angle guarantee smooth running and positive cut
- ◆ Grooves allow fast and easy chip removal
- ◆ Constant profile relief
- ◆ Applicable for steel, cast iron, non-ferrous and light metals.

Center Drill Type:

<p><b>The Plane Type: Form A</b></p> <ul style="list-style-type: none"> <li>◆ DIN333A 60°</li> <li>◆ Most universal type</li> <li>◆ 82° and 90° are available</li> </ul>	
<p><b>The Bell Type: Form B</b></p> <ul style="list-style-type: none"> <li>◆ DIN333B</li> <li>◆ The 60° chamfer for base center hole</li> <li>◆ The 120° protective chamfer guarantees the center from any risk of blows and deformation</li> <li>◆ The 120° splay makes it easier to seize parts between points on machine with automatic feed</li> <li>◆ Ensure more smooth running in following processing</li> <li>◆ Mainly used in the precision components procession.</li> </ul>	
<p><b>The Arc type: Form R</b></p> <ul style="list-style-type: none"> <li>◆ DIN333R</li> <li>◆ Continual inclined arc lines ensure stronger drill point</li> <li>◆ The radius eliminates the risk of breakage</li> <li>◆ Considerably longer tool life</li> </ul>	

Groove Styles:

Straight Flute Type		Spiral Flute Type	
	<ul style="list-style-type: none"> <li>◆ General flute type</li> <li>◆ More economical than spiral flute type</li> </ul>		<ul style="list-style-type: none"> <li>◆ Spiral flutes guarantee completely smooth running and high cutting performance</li> <li>◆ Large and Spiral chip space allows faster and easier chip removal</li> <li>◆ Longer tool life compared with straight flute type</li> </ul>

For longer tool life and better chip removal ability, HSS-E and different coatings are available for different materials processing.

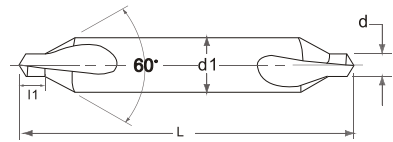
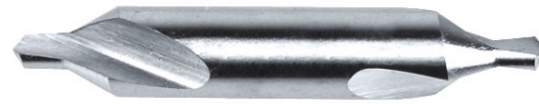
HSS-E	SC	TiN	TiAlN
HSS-Co (Cobalt Hss) have higher red hardness permitting drilling of materials such as heat-resistant alloys and materials with hardness greater than 38HRC and high-alloyed chromium steel such as stainless and acidresistant steel	Tusten Carbide ( SC) are mainly for complicated materials, especially for harder materials. With a long cutting life, SC Center Drills are very suitable for NC and CNC machines	TiN coating can be done as per requirements which can be extended tool life	TiAlN coating can be done as per requirements which can be higher surface hardness and extra tool life

Recommendations For The Use Of Centre Drills

MATERIAL	Vc m/min	HSS					CARBIDE						
		Vf Feed mm/rev					Vc m/min	Vf Feed mm/rev					
		Ø 2	Ø 3	Ø 6	Ø 10	Ø 16		Ø 2	Ø 3	Ø 6	Ø 10	Ø 16	
STEEL:	<500 N/mm <sup>2</sup>	30-45	0.08	0.10	0.20	0.30	0.40	70-80	0.10	0.12	0.22	0.33	0.45
	500-800 N/mm <sup>2</sup>	25-30						60-75					
	800-1000 N/mm <sup>2</sup>	15-25	0.05	0.07	0.14	0.21	0.28	50-60	0.07	0.08	0.15	0.23	0.31
	1000-1300 N/mm <sup>2</sup>	10-15	0.04	0.06	0.12	0.18	0.25	25-40	0.06	0.07	0.13	0.20	0.27
Stainless Steel-titanium Alloys	6-10						15-20	0.06	0.08	0.15	0.20	0.30	
Inconel-nimonic-waspaloy	5-6	0.03	0.05	0.10	0.16	0.22	20-30	0.05	0.07	0.13	0.18	0.27	
Castiron <180 HB	15-25	0.08	0.10	0.20	0.30	0.40	50-60	0.10	0.12	0.22	0.33	0.45	
Castiron >180 HB	10-15	0.06	0.07	0.15	0.25	0.35	35-50	0.08	0.10	0.17	0.30	0.40	
Copper Alloys-Brass	40-50						70-100	0.12	0.15	0.20	0.35	0.40	
Aluminium ≅ 6% Si	60-90	0.10	0.12	0.18	0.30	0.35	100-150						
Aluminium >6% Si	35-50						70-90	0.12	0.15	0.20	0.35	0.40	
Thermoplast	90-100	0.12	0.14	0.20	0.35	0.45	150-200	0.13	0.15	0.25	0.40	0.50	

**HSS Center Drill**  
Plane Type Form A

- ◆ DIN333A 60°
- ◆ Most universal type
- ◆ 82° and 90° are available



**Metric Size**

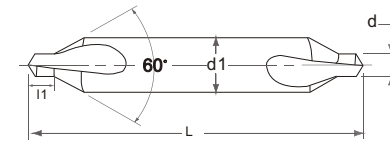
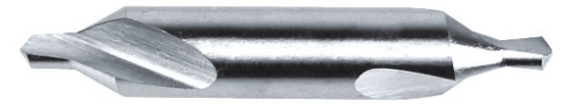
Drill Dia. d (mm)	Drill Length l1 (mm)	Shank Dia. d1 (mm)	Overall Length L (mm)	Straight Flute		Spiral Flute	
				HSS Shiny Order Number	HSS	HSS Shiny Order Number	HSS
1.00	1.30	3.15	31.50	14EA00036		14EA00048	
1.25	1.60	3.15	31.50	14EA00037		14EA00049	
1.60	2.00	4.00	35.50	14EA00038		14EA00050	
2.00	2.50	5.00	40.00	14EA00039		14EA00051	
2.50	3.10	6.30	45.00	14EA00040		14EA00052	
3.15	3.90	8.00	50.00	14EA00041		14EA00053	
4.00	5.00	10.00	56.00	14EA00042		14EA00054	
5.00	6.30	12.50	63.00	14EA00043		14EA00055	
6.30	8.00	16.00	71.00	14EA00044		14EA00056	
8.00	10.10	20.00	80.00	14EA00045		14EA00057	
10.00	12.80	25.00	100.00	14EA00046		14EA00058	
12.50	16.50	31.50	125.00	14EA00047		14EA00059	

are available according to requirements

Extra length 120mm/4" is available

**HSS Center Drill**  
Plane Type Form A

- ◆ ANSI/ASME B94 60°
- ◆ Most universal type
- ◆ 82° and 90° are available



**Imperial Size**

Size No.	Drill Dia. d (inch)	Drill Length l1 (inch)	Shank Dia. d1 (inch)	Overall Length L (inch)	Straight Flute		Spiral Flute	
					HSS Shiny Order Number	HSS	HSS Shiny Order Number	HSS
00	0.025	0.03	1/8"	1-1/8"	14EA00060		14EA00070	
0	1/32"	0.038	1/8"	1-1/8"	14EA00061		14EA00071	
1	3/64"	3/64"	1/8"	1-1/4"	14EA00062		14EA00072	
2	5/64"	5/64"	3/16"	1-7/8"	14EA00063		14EA00073	
3	7/64"	7/64"	1/4"	2"	14EA00064		14EA00074	
4	1/8"	1/8"	5/16"	2-1/8"	14EA00065		14EA00075	
5	3/16"	3/16"	7/16"	2-3/4"	14EA00066		14EA00076	
6	7/32"	7/32"	1/2"	3"	14EA00067		14EA00077	
7	1/4"	1/4"	5/8"	3-1/4"	14EA00068		14EA00078	
8	5/16"	5/16"	3/4"	3-1/2"	14EA00069		14EA00079	

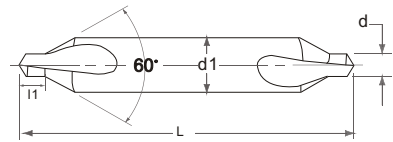
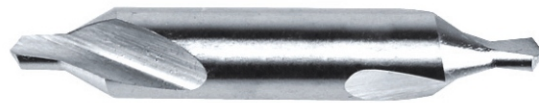
are available according to requirements

Extra length 120mm/4" is available



**HSS Center Drill**  
Plane Type Form A (BS 328)

- ◆ BS328 60°
- ◆ Most universal type
- ◆ 82° and 90° are available



**Imperial Size**

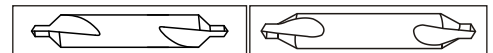
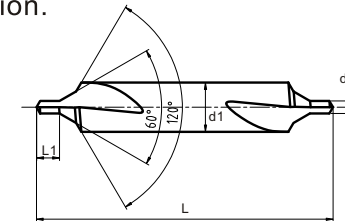
Size No.	Drill Dia. d (inch)	Drill Length l1 (inch)	Shank Dia. d1 (inch)	Overall Length L (inch)	Straight Flute		Spiral Flute	
					HSS Shiny Order Number	HSS	HSS Shiny Order Number	HSS
BS 1	3/64"	5/64"	1/8"	1 1/2"	14EA00080		14EA00087	
BS 2	1/16"	3/32"	3/16"	1 3/4"	14EA00081		14EA00088	
BS 3	3/32"	9/64"	1/4"	2"	14EA00082		14EA00089	
BS 4	1/8"	11/64"	5/16"	2 1/4"	14EA00083		14EA00090	
BS 5	3/16"	17/64"	7/16"	2 1/2"	14EA00084		14EA00091	
BS 6	1/4"	11/32"	5/8"	3"	14EA00085		14EA00092	
BS 7	5/16"	7/16"	3/4"	3 1/2"	14EA00086		14EA00093	

HSS-E / TIN / TiAIN are available according to requirements

Extra length 120mm/4" is available

**HSS Center Drill**  
Bell Type Form B

- ◆ DIN333B
- ◆ The 60° chamfer for base center hole
- ◆ The 120° protective chamfer guarantees the center from any risk of blows and deformation
- ◆ The 120° splay makes it easier to seize parts between points on machine with automatic feed
- ◆ Ensure more smooth running in following processing
- ◆ Mainly used in the precision components procession.



**Metric Size**

Drill Dia. d (mm)	Drill Length l1 (mm)	Bell Dia. d2 (mm)	Shank Dia. d1 (mm)	Overall Length L (mm)	Straight Flute		Spiral Flute	
					HSS Shiny Order Number	HSS	HSS Shiny Order Number	HSS
1.00	1.30	2.12	4.00	35.50	14EB00001		14EB00012	
1.25	1.60	2.65	5.00	40.00	14EB00002		14EB00013	
1.60	2.00	3.35	6.30	45.00	14EB00003		14EB00014	
2.00	2.50	4.25	8.00	50.00	14EB00004		14EB00015	
2.50	3.10	5.30	10.00	56.00	14EB00005		14EB00016	
3.15	3.90	6.70	11.20	60.00	14EB00006		14EB00017	
4.00	5.00	8.50	14.00	67.00	14EB00007		14EB00018	
5.00	6.30	10.60	18.00	75.00	14EB00008		14EB00019	
6.30	8.00	13.20	20.00	80.00	14EB00009		14EB00020	
8.00	10.10	17.00	25.00	100.00	14EB00010		14EB00021	
10.00	12.80	21.20	31.50	125.00	14EB00011		14EB00022	

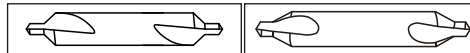
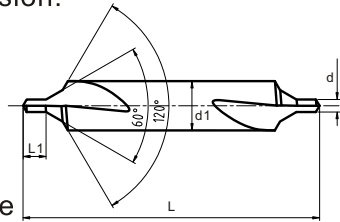
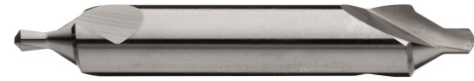
HSS-E / TIN / TiAIN are available according to requirements

Extra length 120mm/4" is available

**HSS Center Drill**

Bell Type Form B

- ◆ ANSI/ASME B94
- ◆ The 60° chamfer for base center hole
- ◆ The 120° protective chamfer guarantees the center from any risk of blows and deformation
- ◆ The 120° splay makes it easier to seize parts between points on machine with automatic feed
- ◆ Ensure more smooth running in following processing
- ◆ Mainly used in the precision components procession.



Imperial Size

Size No.	Drill Dia. d (inch)	Drill Length l1 (inch)	Bell Dia d 2 (inch)	Shank Dia. d 1 (inch)	Overall Length L (inch)	Straight Flute HSS Shiny Order Number	Spiral Flute HSS Shiny Order Number
11	3/64"	3/64"	0.10"	1/8"	1-1/4"	14EB00023	14EB00031
12	1/16"	1/16"	0.15"	3/16"	1-7/8"	14EB00024	14EB00032
13	3/32"	3/32"	0.20"	1/4"	2"	14EB00025	14EB00033
14	7/64"	7/64"	0.25"	5/16"	2-1/8"	14EB00026	14EB00034
15	5/32"	5/32"	0.35"	7/16"	2-3/4"	14EB00027	14EB00035
16	3/16"	3/16"	0.40"	1/2"	3"	14EB00028	14EB00036
17	7/32"	7/32"	0.50"	5/8"	3-1/4"	14EB00029	14EB00037
18	1/4"	1/4"	0.60"	3/4"	3-1/2"	14EB00030	14EB00038

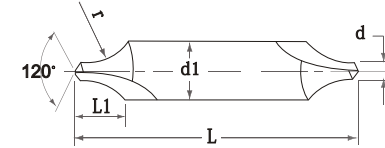
HSS-E / TIN / TiAIN are available according to requirements

Extra length 120mm/4" is available

**HSS Center Drill**

Arc Type Form R

- ◆ DIN333R
- ◆ Continual inclined arc lines ensure stronger drill point
- ◆ The radius eliminates the risk of breakage
- ◆ Considerably longer tool life



Metric Size

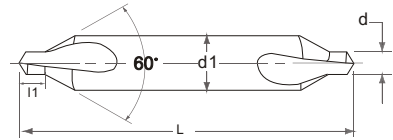
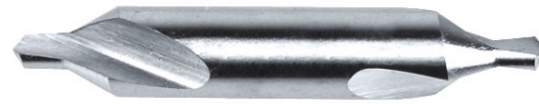
Drill Dia. d (mm)	Drill Length l1 (mm)	r (mm)	Shank Dia. d 1 (mm)	Overall Length L (mm)	Straight Flute HSS Shiny Order Number	Spiral Flute HSS Shiny Order Number
1.00	3.00	2.50	3.15	31.50	14EC00002	14EC00014
1.25	3.35	3.15	3.15	31.50	14EC00003	14EC00015
1.60	4.25	4.00	4.00	35.50	14EC00004	14EC00016
2.00	5.30	5.00	5.00	40.00	14EC00005	14EC00017
2.50	6.70	6.30	6.30	45.00	14EC00006	14EC00018
3.15	8.50	8.00	8.00	50.00	14EC00007	14EC00019
4.00	10.60	10.00	10.00	56.00	14EC00008	14EC00020
5.00	13.20	12.50	12.50	63.00	14EC00009	14EC00021
6.30	17.00	16.00	16.00	71.00	14EC00010	14EC00022
8.00	21.20	20.00	20.00	80.00	14EC00011	14EC00023
10.00	26.50	25.00	25.00	100.00	14EC00012	14EC00024
12.50	16.50	31.50	31.50	125.00	14EC00013	14EC00025

HSS-E / TIN / TiAIN are available according to requirements

Extra length 120mm/4" is available

### Solid Carbide (SC) Center Drill Plane Type Form A

- ◆ DIN333A 60°
- ◆ Most universal type
- ◆ 82° and 90° are available



Metric Size

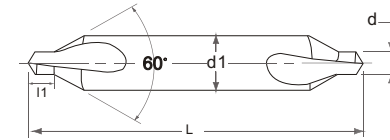
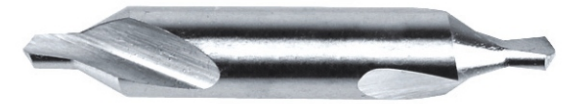
Drill Dia. d (mm)	Drill Length l1 (mm)	Shank Dia. d1 (mm)	Overall Length L (mm)	Straight Flute HSS Shiny Order Number	Spiral Flute HSS Shiny Order Number
1.00	1.30	3.15	31.50	14EA00094	14EA00105
1.25	1.60	3.15	31.50	14EA00095	14EA00106
1.60	2.00	4.00	35.50	14EA00096	14EA00107
2.00	2.50	5.00	40.00	14EA00097	14EA00108
2.50	3.10	6.30	45.00	14EA00098	14EA00109
3.15	3.90	8.00	50.00	14EA00099	14EA00110
4.00	5.00	10.00	56.00	14EA00100	14EA00111
5.00	6.30	12.50	63.00	14EA00101	14EA00112
6.30	8.00	16.00	71.00	14EA00102	14EA00113
8.00	10.10	20.00	80.00	14EA00103	14EA00114
10.00	12.80	25.00	100.00	14EA00104	14EA00115

/ are available according to requirements

Extra length 120mm/4" is available

### Solid Carbide (SC) Center Drill Plane Type Form A

- ◆ ANSI/ASME B94 60°
- ◆ Most universal type
- ◆ 82° and 90° are available



Imperial Size

Size No.	Drill Dia. d (inch)	Drill Length l1 (inch)	Shank Dia. d1 (inch)	Overall Length L (inch)	Straight Flute HSS Shiny Order Number	Spiral Flute HSS Shiny Order Number
1	3/64"	3/64"	1/8"	1-1/4"	14EA00116	14EA00124
2	5/64"	5/64"	3/16"	1-7/8"	14EA00117	14EA00125
3	7/64"	7/64"	1/4"	2"	14EA00118	14EA00126
4	1/8"	1/8"	5/16"	2-1/8"	14EA00119	14EA00127
5	3/16"	3/16"	7/16"	2-3/4"	14EA00120	14EA00128
6	7/32"	7/32"	1/2"	3"	14EA00121	14EA00129
7	1/4"	1/4"	5/8"	3-1/4"	14EA00122	14EA00130
8	5/16"	5/16"	3/4"	3-1/2"	14EA00123	14EA00131

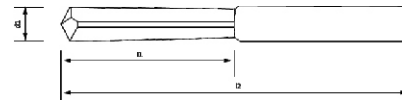
/ are available according to requirements

Extra length 120mm/4" is available

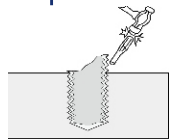


### Solid Carbide (SC) Taps Extractor

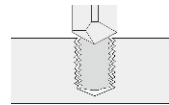
- ◆ Easily remove any broken taps or bolts without damaging the component surface
- ◆ Should be running between 1500 and 3500 revs/min. No cutting fluid required.
- ◆ Steady manual feed component and spindle ability are vital.
- ◆ Applicable for remove any style of High Speed Steel Taps, Straight Flute, Spiral Flute, even Forming / Roll Taps.
- ◆ Also suitable for drilling other hard materials including: hardened steels, glass, stellite etc.



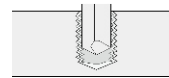
Simple to use in four easy steps.



Step 1: creating a reasonably flat surface.



Step 2: Use as large a diameter Taps Extractor as possible to spot the broken tap.



Step 3: Using the suitable size Taps Extractor drill down through the broken tap.



Step 4: Using a scriber remove the remnants of the broken tap flutes.

#### Metric

Size d1 mm	Flute Length l1 mm	Overall Length l2 mm	Order Number
2mm for M3	10	31	14ZJ00017
3mm for M4 - M5	14	40	14ZJ00018
4mm for M6 - M7	20	46	14ZJ00019
5mm for M8 - M10	24	50	14ZJ00020
6mm for M10 - M12	30	60	14ZJ00021

#### Imperial

Size d1 Inch	Flute Length l1 Inch	Overall Length l2 Inch	Order Number
1/8"	3/8"	2-1/2"	14ZJ00009
3/16"	3/4"	3"	14ZJ00010
1/4"	3/4"	3"	14ZJ00011
5/16"	1"	4"	14ZJ00012

### 5pcs Solid Carbide (SC) Taps Extractor Set, In Plastic Box

Size d1 mm	Flute Length l1 mm	Overall Length l2 mm	Order Number
2mm for M3	10	31	27AZ00001
3mm for M4 - M5	14	40	
4mm for M6 - M7	20	46	
5mm for M8 - M10	24	50	
6mm for M10 - M12	30	60	



### Screw Extractor Spiral Flute Type

- ◆ Made by chrome vanadium steel, overall heat treatment.
- ◆ Designed to remove broken screws, bolts, threaded parts, pins and pipes, easy and fast.

#### Coarse thread model



#### Closely pitched model



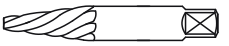
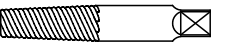
Simple to use in three steps:

Step 1: Drill a hole in the broken parts

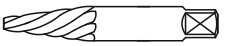
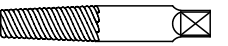
Step 2: Insert extractor with a brass hammer

Step 3: Turn to the left with a tap wrench

#### Metric Size

Extractor No.	Recommended drill size	Remove bolt/ screw size		
			Coarse thread model Order Number	Closely pitched model Order Number
1#	2.5mm	M4-M6	17ID00010	17ID00018
2#	3.5mm	M6-M8	17ID00011	17ID00019
3#	4.5mm	M8-M11	17ID00012	17ID00020
4#	6.5mm	M11-M14	17ID00013	17ID00021
5#	9.0mm	M14-M18	17ID00014	17ID00022
6#	12.0mm	M18-M24	17ID00015	17ID00023
7#	15.0mm	M24-M33	17ID00016	17ID00024
8#	20.0mm	M33-M50	17ID00017	17ID00025

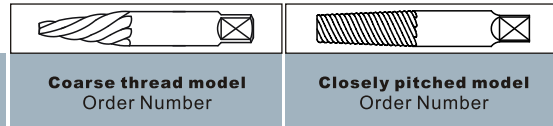
#### Imperial Size

Extractor No.	Recommended drill size	Remove bolt/ screw size		
			Coarse thread model Order Number	Closely pitched model Order Number
1#	5/64"	3/32"-5/32"	17ID00026	17ID00035
2#	7/64"	5/32"-7/32"	17ID00027	17ID00036
3#	5/32"	7/32"-9/32"	17ID00028	17ID00037
4#	1/4"	9/32"-3/8" & 1/8npt	17ID00029	17ID00038
5#	19/64"	3/8"-5/8" & 1/4npt	17ID00030	17ID00039
6#	13/32"	5/8"-7/8" & 3/8npt	17ID00031	17ID00040
7#	17/32"	7/8"-1 1/8" & 1/2npt	17ID00032	17ID00041
8#	13/16"	1 1/8"-1 3/8" & 3/4npt	17ID00033	17ID00042
9#	1 1/8"	1 3/8"& above & 1npt	17ID00034	17ID00043

**5pcs Screw Extractor Set, In Plastic Box**  
Spiral Flute Type

**In Plastic Box**

- ◆ Group of 5 pcs common size for general applications
- ◆ Plastic box convenient for picking and storage

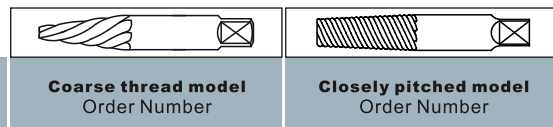


Application range:	Coarse thread model Order Number	Closely pitched model Order Number
Metric Size: No.1#-2#-3#-4#-5#	27CZ00003	27CZ00016
Imperial Size: No.1#-2#-3#-4#-5#	27CZ00015	27CZ00017

**6pcs Screw Extractor Set, In Plastic Box**  
Spiral Flute Type

**In Plastic Box**

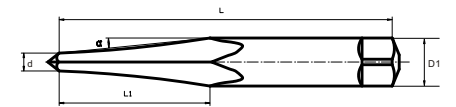
- ◆ Group of 6 pcs common size for general applications
- ◆ Plastic box convenient for picking and storage



Application range:	Coarse thread model Order Number	Closely pitched model Order Number
Metric Size: No.1#-2#-3#-4#-5#-6#	27CZ00004	27CZ00019
Imperial Size: No.1#-2#-3#-4#-5#-6#	27CZ00018	27CZ00020

**Screw Extractors**  
Straight Flute Type

- ◆ Made by chrome vanadium steel, overall heat treatment.
- ◆ Designed to remove broken screws, bolts, threaded parts, pins and pipes, easy and fast.



Simple to use in three steps:

Step 1: Drill a hole in the broken parts

Step 2: Insert extractor with a brass hammer

Step 3: Turn to the left with a tap wrench

Extractor No.	Recommended drill size	Remove bolt/screw size	Order Number
1#	9/64"	3/16"-5/16"	17ID00044
2#	3/16"	3/8"	17ID00045
3#	15/64"	7/16" & 1/8npt	17ID00046
4#	5/16"	1/2"-9/16" & 1/4npt	17ID00047
5#	3/8"	5/8" & 3/8npt	17ID00048
6#	15/32"	3/4" & 1/2npt	17ID00049

**5pcs Screw Extractor set, In pouch bag**  
Straight Flute

**In Pouch Bag**

- ◆ Group of 5 pcs common size for general applications
- ◆ Pouch bag convenient for picking and storage



Application range:	Order Number
No.1#-2#-3#-4#-5#	27CZ00009

### Screw Extractor Square Type

- ◆ Made by chrome vanadium steel, overall heat treatment.
- ◆ Designed to remove broken screws, bolts, threaded parts, pins and pipes, easy and fast.



Simple to use in three steps:

Step 1: Drill a hole in the broken parts

Step 2: Insert extractor with a brass hammer

Step 3: Turn to the left with a wrench

Extractor No.	Recommended drill size	Remove bolt/ screw size	Order Number
1#	1/8"	3/16"-9/32"	17ID00050
2#	3/16"	9/32"-11/32"	17ID00051
3#	15/64"	11/32"-1/2"	17ID00052
4#	5/16"	1/2"-3/4"	17ID00053
5#	3/8"	5/8"-7/8"	17ID00054
6#	15/32"	7/8"-1"	17ID00055
7#	9/16"	1"-1 1/4"	17ID00056
8#	5/8"	1 1/8"-1 1/2"	17ID00057
9#	11/16"	1 1/4"-1 3/4"	17ID00058

### 5pcs Screw Extractor set, In Pouch bag Square Type

#### In Pouch Bag

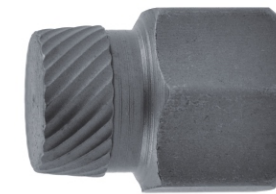
- ◆ Group of 5 pcs common size for general applications
- ◆ Pouch bag convenient for picking and storage



Application range:	Order Number
No.1#-2#-3#-4#-5#	27CZ00010

### Screw Extractor Multi-Spline Type

- ◆ Made by chrome vanadium steel, overall heat treatment.
- ◆ Designed to remove broken screws, bolts, threaded parts, pins and pipes, easy and fast.

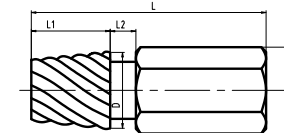


Simple to use in three steps:

Step 1: Drill a hole in the broken parts

Step 2: Insert extractor with a brass hammer

Step 3: Turn to the left with a wrench



Extractor No.	Extractor Size	Recommended drill size	Hex Size	Remove bolt/ screw size	Order Number
1#	1/8"	1/8"	1/2"	1/4"	17ID00059
2#	5/32"	5/32"	1/2"	5/16"	17ID00060
3#	3/16"	3/16"	1/2"	3/8"	17ID00061
4#	7/32"	7/32"	1/2"	7/16"	17ID00062
5#	1/4"	1/4"	1/2"	1/2" & 1/8 pipe	17ID00063
6#	9/32"	9/32"	1/2"	9/16"	17ID00064
7#	5/16"	5/16"	1/2"	5/8"	17ID00065
8#	11/32"	11/32"	1/2"	11/16" & 1/4 pipe	17ID00066
9#	3/8"	3/8"	1/2"	3/4"	17ID00067
10#	13/32"	13/32"	1/2"	13/16"	17ID00068
11#	7/16"	7/16"	5/8"	7/8"	17ID00069
12#	15/32"	15/32"	5/8"	15/16" & 3/8 pipe	17ID00070
13#	1/2"	1/2"	5/8"	1"	17ID00071
14#	17/32"	17/32"	3/4"	1 1/16"	17ID00072
15#	9/16"	9/16"	3/4"	1 1/8"	17ID00073
16#	19/32"	19/32"	3/4"	1 3/16"	17ID00074
17#	5/8"	5/8"	3/4"	1 1/4" & 1/2 pipe	17ID00075
18#	21/32"	21/32"	7/8"	1 5/16"	17ID00076
19#	11/16"	11/16"	7/8"	1 3/8"	17ID00077
20#	23/32"	23/32"	7/8"	1 7/16"	17ID00078
21#	3/4"	3/4"	7/8"	1 1/2"	17ID00079
22#	25/32"	25/32"	1"	1 9/16"	17ID00080
23#	13/16"	13/16"	1"	1 5/8"	17ID00081
24#	27/32"	27/32"	1"	1 11/16"	17ID00082
25#	7/8"	7/8"	1"	1 3/4"	17ID00083



### 10pcs Multi-Spline Screw Extractor Set

**In Blow Molded Case**



Application range:	Order Number
No.1#-2#-3#-4#-5#-6#-7#-8#-9#-10#	27CZ00011

### 25pcs Multi-Spline Screw Extractor Set

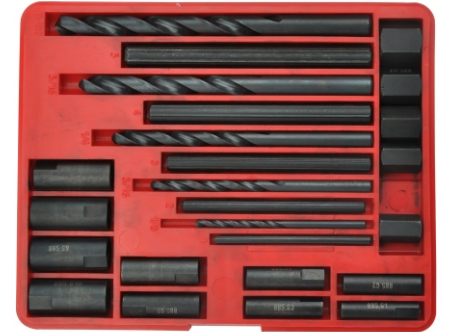
**In Blow Molded Case**



Application range:	Order Number
No.1#-2#-3#-4#-5#-6#-7#-8#-9#-10#-11#-12#-13#-14#-15#-16#-17#-18#-19#-20#-21#-22#-23#-24#-25#	27CZ00012

### 25pcs Extractor Set Straight Screw Type

- ◆ Extractors made by chrome vanadium steel, overall heat treatment.
- ◆ Designed to remove broken screws and bolts without breaking or jamming
- ◆ Turn broken screws and bolts out and permit highest torque without expansion
- ◆ In blow molded case



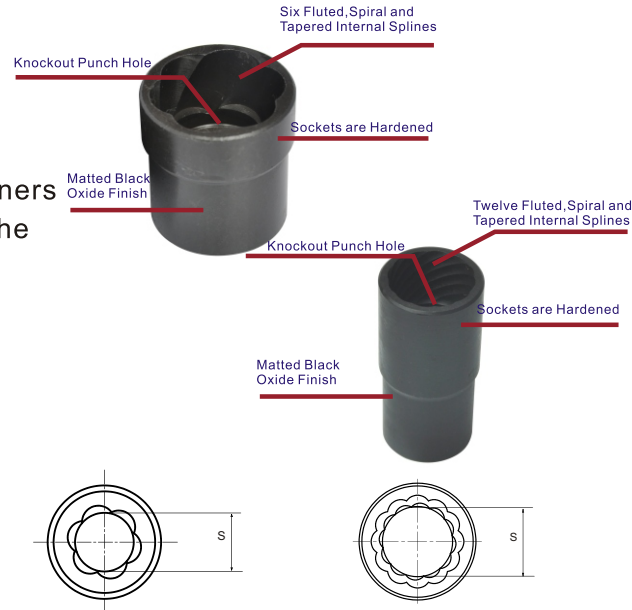
Simple to use in three or four steps:  
 Step 1: Select drill guide and drill to centering drill a hole in the broken parts  
 Step 2: Enlarge the hole if necessary  
 Step 3: Insert extractor with a brass hammer  
 Step 4: Set nut then turn to the left with a wrench

Extractor No.	Nut Size	Drill size	Drill Guide ★	Remove bolt/ screw size	Order Number
1#	1/8"	1/8"	1a or 1b	1/4"	27CZ00013
2#	3/16"	1/8" then 3/16"	2a or 2b	5/16"	
3#	1/4"	3/16" then 1/4"	3a or 3b	3/8"	
4#	5/16"	3/16" then 5/16"	4a or 4b	7/16"	
5#	11/32"	1/4" then 11/32"	5a or 5b	1/2"	

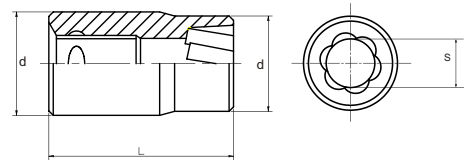
★ Select drill guide according to the O.D. and length of broken screws or broken bolts

### Twist Sockets

- ◆ Manufactured from top quality Chromium Molybdenum(CrMo) Steel with good wear resistance and durability.
- ◆ Twist flute design which give the sockets a tight grip to remove the most difficult fasteners
- ◆ Simply place the twist socket on and turn the damaged fasteners off, No more pounding, chisels or torches, safe and fast
- ◆ Available in 1/4", 3/8" and 1/2" drive sizes
- ◆ Work with impact wrench or breaker bar



### 1/4" Drive Twist Socket 6 Flute



Metric Size

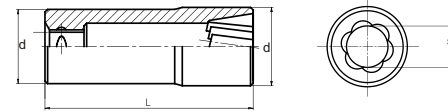
Size s mm	Work End O.D. d mm	O.L. L mm	Black Finish Order No.
8.0	13.2	31.8	17IA00038
10.0	15.1	31.8	17IA00039
12.0	17.8	31.8	17IA00040
14.0	20.1	31.1	17IA00041

Imperial Size

Size s inch	Work End O.D. d inch	O.L. L inch	Black Finish Order No.
5/16"	33/64"	1 1/4"	17IA00087
3/8"	9/16"	1 1/4"	17IA00088
7/16"	41/64"	1 1/4"	17IA00089
1/2"	23/32"	1 1/4"	17IA00090
9/16"	51/64"	1 7/32"	17IA00091



### 1/4" Drive Deep Twist Socket 6 Flute Deep Wall



Metric Size

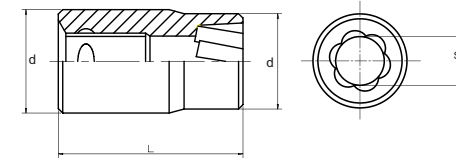
Size s mm	Work End O.D. d mm	O.L. L mm	Black Finish Order No.
8.0	13.2	50.8	17IA00063
10.0	15.1	54.0	17IA00064
12.0	17.8	54.0	17IA00065
14.0	20.1	57.1	17IA00066

Imperial Size

Size s inch	Work End O.D. d inch	O.L. L inch	Black Finish Order No.
5/16"	33/64"	2"	17IA00092
3/8"	9/16"	2 1/8"	17IA00093
7/16"	41/64"	2 1/8"	17IA00094
1/2"	23/32"	2 1/4"	17IA00095
9/16"	51/64"	2 1/4"	17IA00096



### 3/8" Drive Twist Socket 6 Flute



Metric Size

Size s mm	Work End O.D. d mm	O.L. L mm	Black Finish Order No.
8.0	12.7	31.8	17IA00023
10.0	15.1	31.8	17IA00024
11.0(7/16")	16.4	31.8	17IA00025
12.0	17.8	31.8	17IA00026
13.0	18.7	31.8	17IA00027
14.0	20.1	31.8	17IA00028
15.0	21.6	34.9	17IA00029
16.0(5/8")	22.7	34.9	17IA00030
17.0	23.9	34.9	17IA00031
19.0(3/4")	26.5	34.9	17IA00032
22.0	30.0	38.1	17IA00033

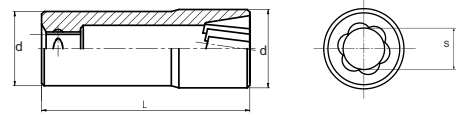
Imperial Size

Size s inch	Work End O.D. d inch	O.L. L inch	Black Finish Order No.
3/8"	9/16"	1 1/4"	17IA00034
1/2"	23/32"	1 1/4"	17IA00035
9/16"	1 7/32"	1 1/4"	17IA00036
11/16"	1"	1 3/8"	17IA00037



**3/8" Drive Deep Twist Socket**

6 Flute Deep Wall



Metric Size

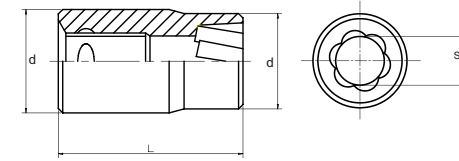
Imperial Size

Size s mm	Work End O.D. d mm	O.L. L mm	Black Finish Order No.
10.0	15.1	54.0	17IA00049
11.0(7/16")	16.4	54.0	17IA00050
12.0	17.8	54.0	17IA00051
13.0	18.7	54.0	17IA00052
14.0	20.1	57.1	17IA00053
15.0	21.6	57.1	17IA00054
16.0(5/8")	22.7	60.3	17IA00055
17.0	23.9	60.3	17IA00056
19.0(3/4")	26.5	60.3	17IA00057

Size s inch	Work End O.D. d inch	O.L. L inch	Black Finish Order No.
3/8"	9/16"	1 1/8"	17IA00059
1/2"	23/32"	1 1/8"	17IA00060
9/16"	1 7/32"	1 1/4"	17IA00061
11/16"	1"	2 3/8"	17IA00062

**1/2" Drive Twist Socket**

6 Flute



Metric Size

Imperial Size

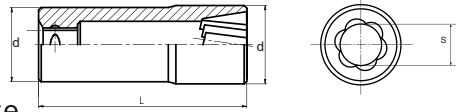
Size s mm	Work End O.D. d mm	O.L. L mm	Black Finish Order No.
10.0	15.0	34.0	17IA00002
11.0(7/16")	17.0	34.0	17IA00003
12.0	18.0	34.0	17IA00004
13.0	19.5	34.0	17IA00005
14.0	21.0	34.0	17IA00006
15.0	22.0	34.0	17IA00007
16.0(5/8")	22.5	34.0	17IA00008
17.0	24.5	34.0	17IA00009
19.0(3/4")	27.0	34.0	17IA00010

Size s inch	Work End O.D. d inch	O.L. L inch	Black Finish Order No.
3/4"	1 1/32"	1 5/8"	17IA00012
13/16"	1 7/64"	1 5/8"	17IA00013
7/8"	1 9/64"	1 5/8"	17IA00014
15/16"	1 17/64"	1 5/8"	17IA00015
1"	1 11/32"	1 5/8"	17IA00016
1 3/16"	1 9/16"	1 5/8"	17IA00017



### 1/2" Drive Deep Twist Socket

6 Flute Deep Wall



Imperial Size

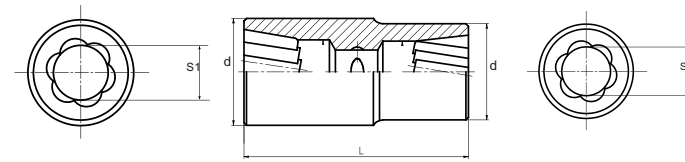
Size s inch	Work End O.D. d inch	O.L. L inch	Black Finish Order No.
3/4"	1 1/32"	2 5/8"	17IA00042
13/16"	1 7/64"	2 5/8"	17IA00043
7/8"	1 9/64"	2 5/8"	17IA00044
15/16"	1 17/64"	2 5/8"	17IA00045
1"	1 11/32"	2 5/8"	17IA00046



### 1/2" Drive Double End Twist Socket

6 Flute 3/4"-19mm & 13/16"-21mm

- ◆ Easily removal of damaged/rounded SAE & Metric 3/4" & 19mm, 13/16" & 21mm lug nuts and the majority of OEM and aftermarket locking lug nuts
- ◆ Work with a 1/2" impact wrench or breaker bar



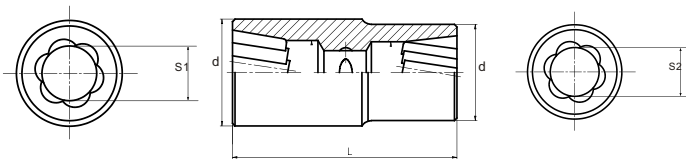
Work End Size s inch	Work End O.D. d inch	O.L. L inch	Black Finish Order No.
3/4"-19mm	1 1/8"	2 5/8"	17IA00067
13/16"-21mm	1/1/4"		



### 1/2" Drive Double End Twist Socket

6 Flute 7/8" & 1"

- ◆ Easily remove 7/8" and 1" damaged OEM & after market locking lug nuts
- ◆ Work with a 1/2" impact wrench or breaker bar



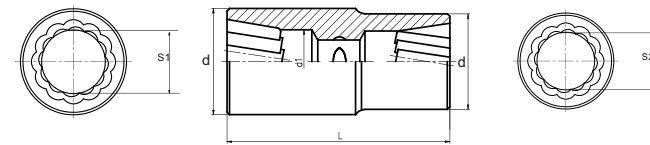
Work End Size s inch	Work End O.D. d inch	O.L. L inch	Black Finish Order No.
7/8"	1 1/4"	2 5/8"	17IA00081
1"	1 3/8"		



### 1/2" Drive Double End Twist Socket

12 Flute 7/8" & 1"

- ◆ Easily remove 7/8" and 1" damaged OEM & after market locking lug nuts
- ◆ Work with a 1/2" impact wrench or breaker bar



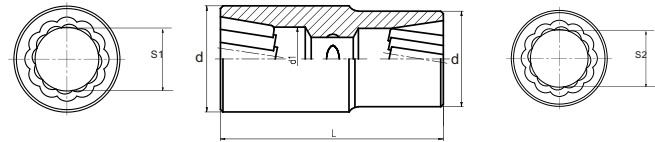
Work End Size s inch	Work End O.D. d inch	O.L. L inch	Black Finish Order No.
7/8"	1 13/64"	2 5/8"	17IA00069
1"	1 19/64"		



### 1/2" Drive Double End Twist Socket

12 Flute 3/4"-19mm&13/16"-21mm

- ◆ Easily removal of damaged/rounded SAE & Matric 3/4" & 19mm, 13/16", and 21mm lug nuts
- ◆ Work with a 1/2" impact wrench or breaker bar

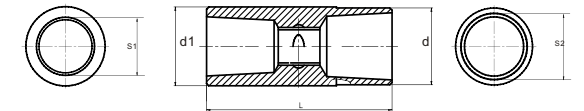


Work End Size s inch	Work End O.D. d inch	O.L. L inch	Black Finish Order No.
3/4"-19mm	1 1/8"	2 5/8"	17IA00068
13/16"-21mm	1 3/16"		

### 1/2" Drive Double End Thin Wall Endocone Socket

Thin Wall Endocone 3/4"-19mm&13/16"

- ◆ Easily removal of damaged/rounded SAE & Matric 3/4" & 19mm, 13/16", and 21mm lug nuts and the majority of OEM and aftermarket locking lug nuts
- ◆ The thin wall allow for removal of lug nuts on specialty wheels and tight tolerances
- ◆ Work with a 1/2" impact wrench or breaker bar

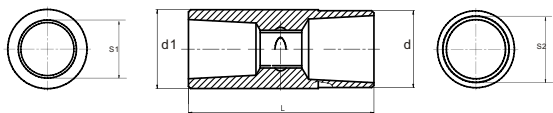


Work End Size s inch	Work End O.D. d inch	O.L. L inch	Black Finish Order No.
3/4"-19mm	1 1/32"	2 1/2"	17IA00070
13/16"	1 1/16"		

### 1/2" Drive Double End Endocone Socket

Endocone 3/4"-19mm&13/16"

- ◆ Easily removal of damaged/rounded SAE & Matric 3/4" & 19mm, 13/16", and 21mm lug nuts and the majority of OEM and after market locking lug nuts
- ◆ Work with a 1/2" impact wrench or breaker bar



Work End Size s inch	Work End O.D. d inch	O.L. L inch	Black Finish Order No.
3/4"-19mm	1 1/4"	2 5/8"	17IA00071
13/16"	1 1/4"		

### 10pcs 3/8" Drive Twist Socket Set

6 Flute

#### In Blow Molded Case With Punch

- ◆ Group of 10 pcs common size for general Applications
- ◆ Blow molded case convenient for picking And storage



Size s mm	Work End O.D. d mm	O.L. L mm	Black Finish Order No.
10.0	15.1	31.8	27CA00004
11.0	16.4	31.8	
12.0	17.8	31.8	
13.0	18.7	31.8	
14.0	20.1	31.8	
15.0	21.6	34.9	
16.0	22.7	34.9	
17.0	23.9	34.9	
19.0	26.5	34.9	

### 10pcs 3/8" Drive Twist Socket Set

6 Flute

#### In Plastic Box With Punch

- ◆ Group of 10 pcs common size for general applications
- ◆ Plastic Box convenient for picking and storage

Size s mm	Work End O.D. d mm	O.L. L mm	Order No.
10.0	15.1	31.8	27CA00006
11.0	16.4	31.8	
12.0	17.8	31.8	
13.0	18.7	31.8	
14.0	20.1	31.8	
15.0	21.6	34.9	
16.0	22.7	34.9	
17.0	23.9	34.9	
19.0	26.5	34.9	



### 15pcs 1/2" Drive Twist Socket Set

6 Flute

#### In Blow Molded Case With Punch

- ◆ Group of 15 pcs common size for general Applications
- ◆ Blow molded case convenient for picking And storage

Size s mm	Work End O.D. d mm	O.L. L mm	Black Finish Order No.
10.0	15.1	31.8	27CA00005
11.0	16.4	31.8	
12.0	17.8	31.8	
13.0	18.7	31.8	
14.0	20.1	31.8	
15.0	21.6	34.9	
16.0	22.7	34.9	
17.0	23.9	22.7	
3/4"	1 1/32"	1 5/8"	
13/16"	1 7/67"	1 5/8"	
7/8"	1 9/64"	1 5/8"	
15/16"	1 17/64"	1 5/8"	
1"	1 11/32"	1 5/8"	
1 3/16	1 9/16"	1 5/8"	

