SUPERIOR PERFORMANCE

COUNTERSINK
THREE FLUTE

90º as standard but also available as 60º or 120º.

HSS or HSSCo base material for longer tool life.

Self centering, can be used for chamfering.

Unequal flute spacing for chatter-free surface finish.

IDEAL FOR MATERIAL GROUPS

P H M K S N O

HSSCo & HSS COUNTERBORES & COUNTERSINKS

Clarkson

sborn

www.europatool.co.uk

APPLICATION GUIDE

INDEX

●: Excellent **O**: Good

P				H		M			K				S						N								O		
11	12	13	14	15	16	21	22	23	31	32	33	34	41	42	43	51	52	53	61	62	63	64	71	72	73	74	81	82	83
●	●	●	●			o	o		o	o	o		o	o		o	o		o	o	o		●	●	●		●	●	
●	●	●	●	o	o	o	o	o	o	o	o	o	o	o		o	o		o	o	o		o	o	o		●	●	
●	●	●	●	o	o	o	o	o	o	o	o	o	o	o		o	o		o	o	o		o	o	o		●	●	
●	●	●	●	o	o	o	o	o	o	o	o	o	o	o		o	o		o	o	o	o	o	o	o	o	●	●	

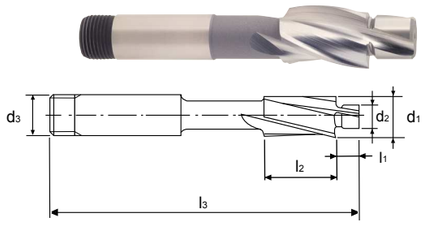
- For material group examples, refer to page 2
- For full material group tables, refer to pages 194-199

SCREWED SHANK COUNTERBORE

HSS | EUROPA STD | FLUTE 3

Series No. 151201

▶ cutting conditions : p.185



Application
For producing recesses for cap screws.

EUROPA CODE	To suit Thread	Outside Diameter	Pilot Diameter	Shank Diameter	Pilot Length	Length Of Cut	Overall Length	Clarkson Code
1512010400	M4	8	4.3	6	5.5	12.5	65	**29M04**
1512010500	M5	10	5.3	6	6.5	12.5	70	**29M05**
1512010600	M6	11	6.4	6	8	12.5	76	**29M06**
1512010800	M8	15	8.4	10	9.5	19	87.3	**29M08**
1512011000	M10	18	10.5	10	11	19	89	**29M10**
1512011200	M12	20	13.0	12	13.5	25.5	108	**29M12**
1512011400	M14	24	15.0	16	16.5	31.5	121	**29M14**
1512011600	M16	26	17.0	16	19	38	124	**29M16**
1512011800	M18	30	19.0	25	19	44.5	147	**29M18**
1512012000	M20	33	21.0	25	21.5	44.5	149	**29M20**

●: Excellent **O**: Good

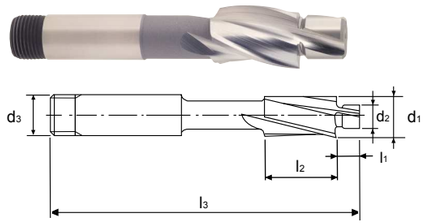
P		H	M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
●	●		O	O	O	O	O	O		O	O	O		●	●
13	14	16	23		33	34	51	52	53	71	72	73	74	83	
●	●				O		O	O		●	●	●			

SCREWED SHANK COUNTERBORE

HSS | EUROPA STD | FLUTE 3

Series No.151201

▶ cutting conditions : p.185



Application
For producing recesses for cap screws.

EUROPA CODE	To suit Thread	Outside Diameter d1	Pilot Diameter d2	Shank Diameter d3	Pilot Length l1	Length Of Cut l2	Overall Length l3	Clarkson Code
15120102BA	2BA	0.344"	0.200"	1/4"	7/32"	1/2"	2.1/2"	**29002**
15120104BA	4BA	0.251"	0.156"	1/4"	7/32"	7/16"	2.1/2"	**29004**
1512010250	1/4"	13/32"	9/32"	1/4"	5/16"	1/2"	3"	**29016**
1512010200	5/16"	15/32"	11/32"	3/8"	3/8"	5/8"	3.1/4"	**29020**
1512010240	3/8"	19/32"	13/32"	3/8"	7/16"	3/4"	3.1/2"	**29024**
1512010280	7/16"	21/32"	15/32"	1/2"	17/32"	7/8"	4	**29028**
1512010320	1/2"	25/32"	17/32"	1/2"	17/32"	1"	4.1/4"	**29032**
1512010360	9/16"	27/32"	19/32"	5/8"	19/32"	1.1/8"	4.17/32"	**29036**
1512019400	5/8"	29/32"	21/32"	5/8"	21/32"	1.1/4"	4.25/32"	**29040**
1512010480	3/4"	1.1/32"	25/32"	1"	25/32"	1.1/2"	5.7/16"	**29048**
1512010560	7/8"	1.5/32"	29/32"	1"	29/32"	1.3/4"	5.15/16"	**29056**
1512010640	1"	1.11/32"	1.1/32"	1"	1.1/32"	2"	6.7/16"	**29064**

●: Excellent **O**: Good

P		H	M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
●	●		O	O	O	O	O	O		O	O	O		●	●
13	14	16	23		33	34	51	52	53	71	72	73	74	83	
●	●				O		O	O		●	●	●			

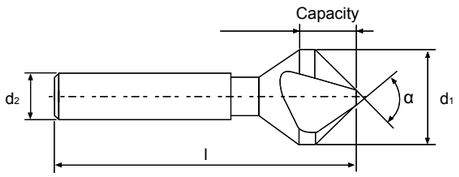
COUNTERBORES & COUNTERSINKS

HSSCo 3-FL COUNTERSINK 90°

HSSCo | DIN 335C | FLUTE 3

Series No. 702302

▶ cutting conditions : p.186



Application
For producing countersinks for cap screws.
Self centering and chatter free.
Can be used for chamfering.

EUROPA CODE	Nominal Diameter D_1	Shank Diameter D_2	Overall Length L(±1)	Capacity min/max	Angle α(-1°)
7023020430	4.3	4	40	1.3 - 4.3	90°
7023020500	5.0	4	40	1.5 - 5.0	90°
7023020600	6.0	5	45	1.5 - 6.0	90°
7023020630	6.3	5	45	1.5 - 6.3	90°
7023020700	7.0	6	50	1.8 - 7.0	90°
7023020800	8.0	6	50	2.0 - 8.0	90°
7023020830	8.3	6	50	2.0 - 8.3	90°
7023021000	10.0	6	50	2.5 - 10.0	90°
7023021040	10.4	6	50	2.5 - 10.4	90°
7023021150	11.5	8	56	2.8 - 11.5	90°
7023021240	12.4	8	56	2.8 - 12.4	90°
7023021500	15.0	10	60	3.2 - 15.0	90°
7023021650	16.5	10	60	3.2 - 16.5	90°
7023021900	19.0	10	63	3.5 - 19.0	90°
7023022050	20.5	10	63	3.5 - 20.5	90°
7023022300	23.0	10	67	3.8 - 23.0	90°
7023022500	25.0	10	67	3.8 - 25.0	90°
7023023000	30.0	12	71	4.2 - 30.0	90°
7023023100	31.0	12	71	4.2 - 31.0	90°

▶ TiN & TiAlN coating are available on request.

Nominal Dia. Tolerance(mm)	Shank Dia. Tolerance(mm)
±0.05	h9

●: Excellent **O**: Good

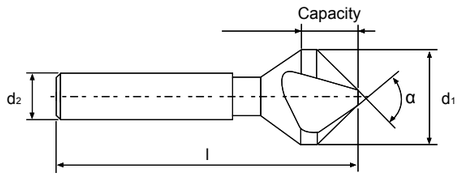
P		H	M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
●	●	O	O	O	O	O	O	O		O	O	O		●	●
13	14	16	23		33	34	51	52	53	71	72	73	74	83	
●	●	O	O		O	O	O	O		O	O	O			

HSS 3-FL COUNTERSINK 90°

HSS | DIN 335C | FLUTE 3

Series No.702301

▶ cutting conditions : p.186



Application
For producing countersinks for cap screws.
Self centering and chatter free.
Can be used for chamfering.

EUROPA CODE	Nominal Diameter d_1	Shank Diameter d_2	Overall Length l(±1)	Capacity min/max	Angle α(-1°)
7023010430	4.3	4	40	1.3 - 4.3	90°
7023010500	5.0	4	40	1.5 - 5.0	90°
7023010600	6.0	5	45	1.5 - 6.0	90°
7023010630	6.3	5	45	1.5 - 6.3	90°
7023010700	7.0	6	50	1.8 - 7.0	90°
7023010800	8.0	6	50	2.0 - 8.0	90°
7023010830	8.3	6	50	2.0 - 8.3	90°
7023011000	10.0	6	50	2.5 - 10.0	90°
7023011040	10.4	6	50	2.5 - 10.4	90°
7023011150	11.5	8	56	2.8 - 11.5	90°
7023011240	12.4	8	56	2.8 - 12.4	90°
7023011500	15.0	10	60	3.2 - 15.0	90°
7023011650	16.5	10	60	3.2 - 16.5	90°
7023011900	19.0	10	63	3.5 - 19.0	90°
7023012050	20.5	10	63	3.5 - 20.5	90°
7023012300	23.0	10	67	3.8 - 23.0	90°
7023012500	25.0	10	67	3.8 - 25.0	90°
7023013000	30.0	12	71	4.2 - 30.0	90°
7023013100	31.0	12	71	4.2 - 31.0	90°

▶ TiN & TiAlN coating are available on request.
▶ 60° and 120° are available on request.

Nominal Dia. Tolerance(mm)	Shank Dia. Tolerance(mm)
±0.05	h9

●: Excellent **O**: Good

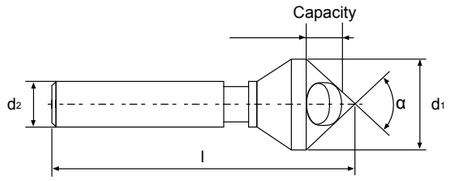
P		H	M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
●	●	O	O	O	O	O	O	O		O	O	O		●	●
13	14	16	23		33	34	51	52	53	71	72	73	74	83	
●	●	O	O		O	O	O	O		O	O	O			

DEBURRING COUNTERSINK 90°

HSSCo

Series No. 702402

▶ cutting conditions : p.187



Application
For deburring most materials and small chamfering of light metals and plastics.
Chatter free for excellent surface finish.

EUROPA CODE	Nominal Diameter d_1	Shank Diameter d_2	Overall Length l(±1)	Capacity min/max	Angle α(-1°)
7024021000	10.0	6	45	2.0 - 5.0	90°
7024021500	15.0	8	55	6.0 - 14.0	90°
7024022000	20.0	10	65	8.0 - 18.0	90°
7024022500	25.0	12	78	10.0 - 23.0	90°
7024023000	30.0	12	88	12.0 - 28.0	90°
7024023500	35.0	16	110	14.0 - 33.0	90°
7024024000	40.0	16	115	16.0 - 38.0	90°
7024024500	45.0	16	120	18.0 - 43.0	90°
7024025000	50.0	16	130	20.0 - 48.0	90°

Nominal Dia. Tolerance(mm)	Shank Dia. Tolerance(mm)
+0.3	h9

●: Excellent **O**: Good

P		H	M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
●	●	O	O	O	O	O	O	O		O	O	O	O	●	●
13	14	16	23		33	34	51	52	53	71	72	73	74	83	
●	●	O	O		O	O	O	O		O	O	O	O		

COUNTERBORE & COUNTERSINK CUTTING CONDITIONS

151201 (HSS Counterbore)

Material Group		v_c (m/min)	f_n (mm/rev) ø8.0 -10.0	ø11.0 -15.0	ø18.0 -20.0	ø24.0 -26.0	ø30.0 -33.0
P	11	**28 (25-30)**	0.11 (0.10-0.12)	0.14 (0.12-0.16)	0.17 (0.16-0.18)	0.20 (0.18-0.22)	0.25 (0.23-0.27)
	12						
	13	**18 (15-20)**	0.09 (0.08-0.10)	0.12 (0.10-0.14)	0.14 (0.13-0.15)	0.18 (0.16-0.20)	0.20 (0.18-0.22)
	14						
H	15	**8 (5-10)**	0.07 (0.06-0.08)	0.10 (0.08-0.12)	0.12 (0.11-0.13)	0.14 (0.12-0.16)	0.16 (0.14-0.18)
	16						
M	21	**7 (6-8)**	0.07 (0.06-0.08)	0.10 (0.08-0.12)	0.12 (0.11-0.13)	0.14 (0.12-0.16)	0.16 (0.14-0.18)
	22						
K	31	**20 (15-25)**	0.11 (0.10-0.12)	0.14 (0.12-0.16)	0.17 (0.16-0.18)	0.20 (0.18-0.22)	0.25 (0.23-0.27)
	32						
	33	**10 (8-12)**	0.09 (0.08-0.10)	0.12 (0.10-0.14)	0.14 (0.13-0.15)	0.18 (0.16-0.20)	0.20 (0.18-0.22)
S	41	**11 (10-12)**	0.11 (0.10-0.12)	0.14 (0.12-0.16)	0.17 (0.16-0.18)	0.20 (0.18-0.22)	0.25 (0.23-0.27)
	42						
	51	**10 (8-12)**	0.09 (0.08-0.10)	0.12 (0.10-0.14)	0.14 (0.13-0.15)	0.18 (0.16-0.20)	0.20 (0.18-0.22)
	52						
N	61	**23 (20-25)**	0.07 (0.06-0.08)	0.10 (0.08-0.12)	0.12 (0.11-0.13)	0.14 (0.12-0.16)	0.16 (0.14-0.18)
	62						
	63						
	71	**28 (25-30)**	0.14 (0.12-0.16)	0.16 (0.14-0.18)	0.19 (0.18-0.20)	0.22 (0.20-0.24)	0.26 (0.24-0.28)
	72						
	73	**20 (18-22)**	0.11 (0.10-0.12)	0.14 (0.12-0.16)	0.17 (0.16-0.18)	0.20 (0.18-0.22)	0.25 (0.23-0.27)
O	81	**25 (20-30)**	0.07 (0.06-0.08)	0.10 (0.08-0.12)	0.12 (0.11-0.13)	0.14 (0.12-0.16)	0.16 (0.14-0.18)
	82						

v_c - cutting speed (m/min)
n - RPM (rev/min)
f_n - feed rate (mm/rev)
ø - tool diameter (mm)

To calculate RPM from cutting speed: $n = \frac{v_c * 1000}{\pi * ø}$

To calculate cutting speed from RPM: $v_c = \frac{n * \pi * ø}{1000}$

All recommendations are based on ideal machining conditions. Adjustments may need to be made according to your set-up. The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points.

COUNTERBORE & COUNTERSINK CUTTING CONDITIONS

sborn

702302, 702301 (HSSCo & HSS Countersink)

Material Group		v_c (m/min)	f_n (mm/rev)				
			ø4.3 -6.3	ø7.0 -10.0	ø10.4 -15.0	ø16.5 -23.0	ø25.0 -31.0
P	11	**28 (25-30)**	0.08 (0.06-0.10)	0.10 (0.08-0.12)	0.15 (0.13-0.17)	0.18 (0.16-0.20)	0.23 (0.22-0.25)
	12						
	13	**18 (15-20)**	0.06 (0.04-0.08)	0.08 (0.06-0.10)	0.12 (0.10-0.14)	0.15 (0.13-0.17)	0.18 (0.16-0.20)
	14						
H	15	**8 (5-10)**	0.05 (0.04-0.06)	0.06 (0.04-0.08)	0.10 (0.08-0.12)	0.12 (0.10-0.14)	0.14 (0.12-0.16)
	16						
M	21	**7 (6-8)**	0.05 (0.04-0.06)	0.06 (0.04-0.08)	0.10 (0.08-0.12)	0.12 (0.10-0.14)	0.14 (0.12-0.16)
	22						
	23						
K	31	**20 (15-25)**	0.08 (0.06-0.10)	0.10 (0.08-0.12)	0.15 (0.13-0.17)	0.18 (0.16-0.20)	0.23 (0.22-0.25)
	32						
	33	**10 (8-12)**	0.06 (0.04-0.08)	0.08 (0.06-0.10)	0.12 (0.10-0.14)	0.15 (0.13-0.17)	0.18 (0.16-0.20)
	34						
S	41	**11 (10-12)**	0.08 (0.06-0.10)	0.10 (0.08-0.12)	0.15 (0.13-0.17)	0.18 (0.16-0.20)	0.23 (0.22-0.25)
	42						
	51	**10 (8-12)**	0.06 (0.04-0.08)	0.08 (0.06-0.10)	0.12 (0.10-0.14)	0.15 (0.13-0.17)	0.18 (0.16-0.20)
	52						
N	61	**23 (20-25)**	0.05 (0.04-0.06)	0.06 (0.04-0.08)	0.10 (0.08-0.12)	0.12 (0.10-0.14)	0.14 (0.12-0.16)
	62						
	63						
	71	**28 (25-30)**	0.10 (0.08-0.12)	0.12 (0.10-0.14)	0.16 (0.14-0.18)	0.20 (0.18-0.22)	0.22 (0.20-0.24)
	72						
	73	**20 (18-22)**	0.08 (0.06-0.10)	0.10 (0.08-0.12)	0.15 (0.13-0.17)	0.18 (0.16-0.20)	0.23 (0.22-0.25)
0	81	**25 (20-30)**	0.05 (0.04-0.06)	0.06 (0.04-0.08)	0.10 (0.08-0.12)	0.12 (0.10-0.14)	0.14 (0.12-0.16)
	82						

v_c - cutting speed (m/min)
n - RPM (rev/min)
f_n - feed rate (mm/rev)
ø - tool diameter (mm)

To calculate RPM from cutting speed: $n = \frac{v_c * 1000}{\pi * ø}$

To calculate cutting speed from RPM: $v_c = \frac{n * \pi * ø}{1000}$

All recommendations are based on ideal machining conditions. Adjustments may need to be made according to your set-up. The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points.

COUNTERBORE & COUNTERSINK CUTTING CONDITIONS

sborn

702402 (Deburring countersink)

Material Group		v_c (m/min)	f_n (mm/rev)				
			ø10.0 -15.0	ø20.0 -25.0	ø30.0 -35.0	ø40.0 -45.0	ø50.0
P	11	**28 (25-30)**	0.11 (0.10-0.12)	0.17 (0.15-0.18)	0.20 (0.18-0.22)	0.22 (0.20-0.24)	0.23 (0.21-0.25)
	12						
	13	**18 (15-20)**	0.09 (0.08-0.10)	0.13 (0.12-0.14)	0.16 (0.15-0.17)	0.18 (0.17-0.19)	0.19 (0.18-0.20)
	14						
H	15	**8 (5-10)**	0.06 (0.05-0.07)	0.08 (0.07-0.09)	0.10 (0.09-0.11)	0.12 (0.11-0.13)	0.13 (0.12-0.14)
	16						
M	21	**7 (6-8)**	0.06 (0.05-0.07)	0.08 (0.07-0.09)	0.10 (0.09-0.11)	0.12 (0.11-0.13)	0.13 (0.12-0.14)
	22						
	23						
K	31	**20 (15-25)**	0.11 (0.10-0.12)	0.17 (0.15-0.18)	0.20 (0.18-0.22)	0.22 (0.20-0.24)	0.23 (0.21-0.25)
	32						
	33	**10 (8-12)**	0.09 (0.08-0.10)	0.13 (0.12-0.14)	0.16 (0.15-0.17)	0.18 (0.17-0.19)	0.19 (0.18-0.20)
	34						
S	41	**11 (10-12)**	0.11 (0.10-0.12)	0.17 (0.15-0.18)	0.20 (0.18-0.22)	0.22 (0.20-0.24)	0.23 (0.21-0.25)
	42						
	51	**10 (8-12)**	0.09 (0.08-0.10)	0.13 (0.12-0.14)	0.16 (0.15-0.17)	0.18 (0.17-0.19)	0.19 (0.18-0.20)
	52						
N	61	**23 (20-25)**	0.06 (0.05-0.07)	0.08 (0.07-0.09)	0.10 (0.09-0.11)	0.12 (0.11-0.13)	0.13 (0.12-0.14)
	62						
	63						
	64						
	71	**28 (25-30)**	0.11 (0.10-0.12)	0.17 (0.15-0.18)	0.20 (0.18-0.22)	0.22 (0.20-0.24)	0.23 (0.21-0.25)
	72						
	73	**20 (18-22)**	0.09 (0.08-0.10)	0.13 (0.12-0.14)	0.16 (0.15-0.17)	0.18 (0.17-0.19)	0.19 (0.18-0.20)
	74						
0	81	**25 (20-30)**	0.11 (0.10-0.12)	0.17 (0.15-0.18)	0.20 (0.18-0.22)	0.22 (0.20-0.24)	0.23 (0.21-0.25)
	82						

v_c - cutting speed (m/min)
n - RPM (rev/min)
f_n - feed rate (mm/rev)
ø - tool diameter (mm)

To calculate RPM from cutting speed: $n = \frac{v_c * 1000}{\pi * ø}$

To calculate cutting speed from RPM: $v_c = \frac{n * \pi * ø}{1000}$

All recommendations are based on ideal machining conditions. Adjustments may need to be made according to your set-up. The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points.

COUNTERBORES & COUNTERSINKS