HSS tools

Machine taps, centre drills, countersinks

– EN –

ZCC Cutting Tools Europe GmbH
your Partner \ your Value

The Company

Zhuzhou Cemented Carbide Cutting Tools Co., Ltd. (ZCC-CT), based in Zhuzhou, China, is the largest Chinese manufacturer of carbide tools. It is also a key company of China Tungsten High-Tech Material Co. Ltd. part of the China Minmetals Corporation.

Since its founding in 1953, ZCC Cutting Tools Co., Ltd. has grown to become one of the world's leading carbide manufacturers with more than 2,000 employees by using the latest technologies and employing highly skilled personnel. The company continuously modernises production technologies and expands its production capacities to enable the company's ongoing growth. As part of Minmetals Corporation, ZCC-CT is able to cover the entire value chain of modern carbide tool production itself, from raw material extraction through to the coated end product and all associated intermediate steps.

By drawing on the latest in European production technology, the company offers products that consistently meet the highest quality standards. Our extensive product range includes carbide/solid carbide, cermet, CBN, PCD and ceramic inserts, carbide tools, tool holders, milling bodies and the accompanying tool systems. All products are consistently produced to accepted international standards, including ISO, DIN, ANSI, JIS and BSI. In addition, ZCC-CT offers customised solutions and special carbide products built to individual specifications.

ZCC-CT invests heavily in research and development. The associated investments go beyond that of most competitors. ZCC Cutting Tools' excellently trained engineers, scientists and a competent, international team, research the necessary fundamentals. These form the basis for the ongoing development of new products and the improvement of existing ones.

The company continuously introduces improvements in quality to meet the customers' ever-increasing demands for new and innovative products and to maximise the benefit of each individual customer. Both production and administration in China are subject to the ISO 9001:2008 standard, while environmental management is subject to the requirements set out in ISO 14001:2004.

The foundation of the European headquarters of ZCC-CT, ZCC Cutting Tools Europe GmbH and the European central warehouse, both located in Düsseldorf (Germany), dates back to 2003. Today, all European countries as well as the adjacent markets are served from there.

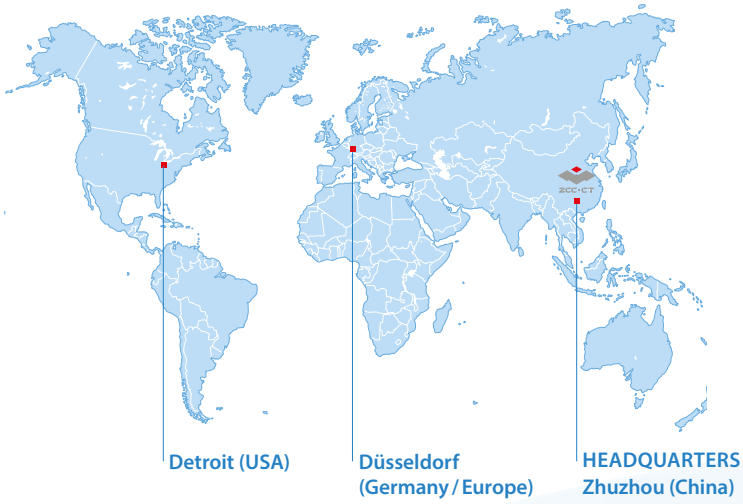
The quality management system of ZCC Cutting Tools Europe GmbH is certified in the area of 'distribution and logistics of metal-working tools' in accordance with ISO 9001:2008.

A test and demonstration centre is also available for optimizing customer processes according to individual requirements.

External sales staff and distribution partners in Europe work hand in hand to support customers across the region. Our friendly ZCC-CT application engineers are also available to support you with their expertise and experience by phone, e-mail or in person at your production facility.

The entire field and office sales force is available to answer enquiries from clients across Europe in their native language. Together with employees from the logistics team and with the help of a sophisticated service system, they ensure that all orders are delivered as quickly as possible to you. Branch offices in France and Great Britain add to additional regional proximity to customers.

ZCC Cutting Tools Europe GmbH and all of our employees are there for you and have your back as a competent partner for all matters concerning machining production. This is how we define 'your partner – your value'.



Member of Minmetals Group

HSS threading tools

Technical information

C

HSS machine taps

Complementing the solid carbide range

HSS-E
The best value for your money

HSS-E is a high-performance cobalt alloyed cutting material which maintains thermal resistance even if the supply of coolant is less than optimal. The addition of 5% Co to the alloy used in the cutting material makes it simple to machine workpieces with tensile strengths of more than 800 N/mm^2.

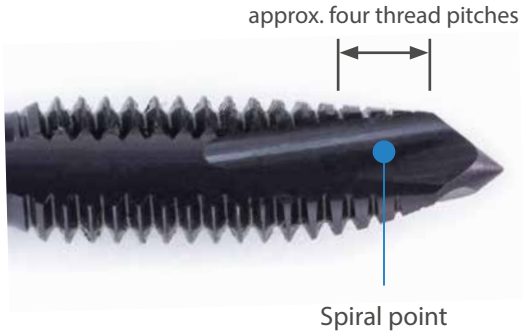
HSS-PM
Long tool life for consistent results in mass-production operations

High-speed metallurgy steel (HSS-PM) contains a high percentage of alloying elements. This gives it unique properties for enhanced toughness, wear resistance and hardness while improving consistency and extending tool life by up to one third.

PVD coated HSS-E/HSS-PM

Grade	Grade description
HG23	PVD coated **HSS-E** is a 5% cobalt high-speed steel used in the machining of steel, stainless steel, aluminium, cast iron and superalloys. Use up to 30 HRC.
HG43	PVD coated **HSS-PM** metallurgy steel is used in the machining of steel, stainless steel, aluminium, cast iron and superalloys. It is particularly well suited for mass-production operations. Use up to 30 HRC.

Chamfer forms acc. to DIN 2197



YOUR BENEFITS

– Best value for your money
– Consistent production results with high fracture toughness
– Universal tool for use with a range of materials

Technical specifications

– **Form B:** through hole thread, internal cooling with radial exit
– **Form C:** blind hole thread, internal cooling with axial exit
– Shank types: DIN 371 ≤ M10, DIN 376 ≥ M8, DIN 374 ≥M12, DIN 5156 G1/8"–G1"
– 6H tolerance: standard tolerance
– 6HX tolerance: tighter manufacturing tolerance (available on request)
– With or without internal cooling
– All types are coated with TiAlN

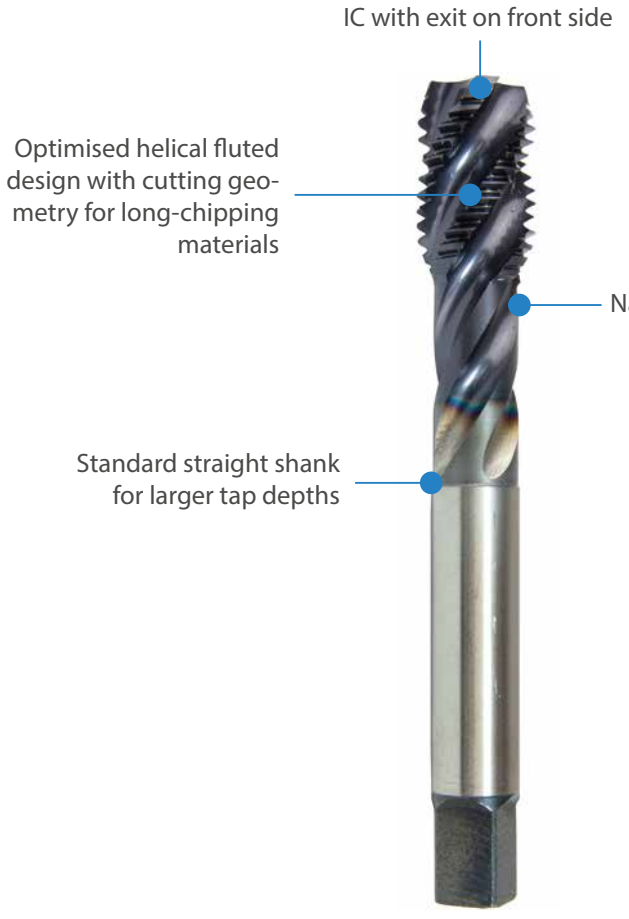


Fig.: 4601US-HG23

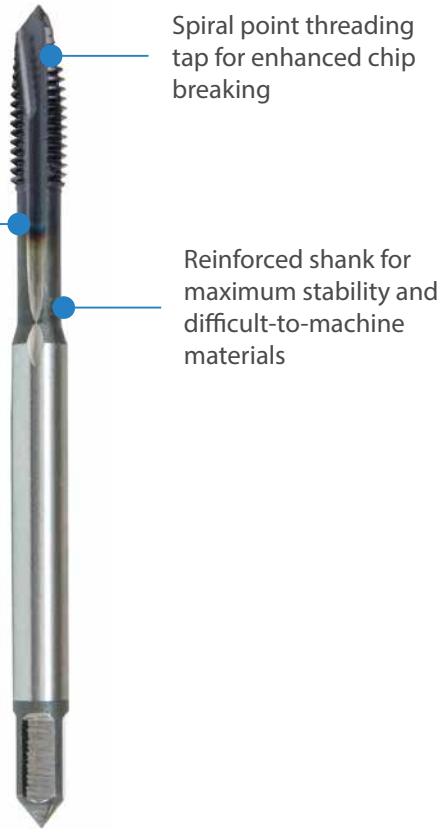


Fig.: 4702U-HG23

HSS threading tools Product recommendations

Products	HSS machine taps	Ø	Application						Type	Page
			P	M	K	N	S	H		
4701US		M3–M10	✓	✓	✓	✓	✓		ISO metric coarse thread	C9
4601US		M8–M24	✓	✓	✓	✓	✓		ISO metric coarse thread	C10
4702U		M3–M10	✓	✓	✓	✓	✓		ISO metric coarse thread	C11
4602U		M8–M24	✓	✓	✓	✓	✓		ISO metric coarse thread	C12
4701US		M3–M10	✓	✓	✓	✓	✓		ISO metric fine thread	C13
4401US		M12–M24	✓	✓	✓	✓	✓		ISO metric fine thread	C14
4702U		M3–M10	✓	✓	✓	✓	✓		ISO metric fine thread	C15
4402U		M12–M24	✓	✓	✓	✓	✓		ISO metric fine thread	C16
4301US		G1/8"–G1"	✓	✓	✓	✓	✓		Whitworth pipe thread DIN ISO 228	C17
4302U		G1/8"–G1"	✓	✓	✓	✓	✓		Whitworth pipe thread DIN ISO 228	C18

✓ Very suitable ✓ Suitable

4	7	0	1	U	(C)	(S)	–	M10×1	–	6H	HG23
1	2	3	4	5	6	7		8		9	10

Type	
Code	Description
4	Threading tool

1

Shank type	
Code	Description
1	Straight shank
2	Straight shank DIN10
5	Straight shank DIN 6535 HA
9	Conical shank
4	DIN 374
6	DIN 376
7	DIN 371
3	DIN 5156

2

Tool type	
Code	Description
0	Tap
1	Thread milling cutter
2	Thread former

3

Flute	
Code	Description
1	Right-hand twist
2	Straight
3	Left-hand twist

4

Material	
Code	Description
A	Aluminum alloy
C	Cast iron
M	Stainless steel
P	Steel
H	Hardened steel
U	Universal

5

Coolant supply	
Code	Description
C	Internal

6

Blind hole	
Code	Description
S	Blind holes: form C

7

Thread type	
Code	Description
M10×1	ISO metric fine thread (MF)
M12	Metric thread (M)
UNC	UNC thread
G1/8"	Whitworth pipe thread

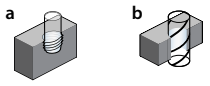
8

Precision class	
Code	Description
6H	Nominal diameter x pitch
6HX	Fine production tolerance

9

Grade
Description
HG23
HG43

10

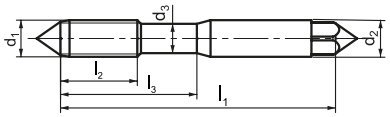


a Bottoming thread **b Through tap**

HSS machine taps ISO metric coarse thread

4701US

– 40° right-hand spiral flute: form C
– Shank type: DIN 371
– Blind hole thread



Article	✻	Dimensions [mm]								Ø Drill	Grade	
			d_1	P	d_2	d_3	l_1	l_2	l_3	d	HG23	HG43
4701US-M3-6H		2P	M3	0,5	3,5	2,22	56	5	18	2,5	●	○
4701US-M4-6H		2P	M4	0,7	4,5	2,9	63	7	21	3,3	●	○
4701US-M5-6H		2P	M5	0,8	6	3,65	70	8	25	4,2	●	○
4701US-M6-6H		2P	M6	1	6	4,6	80	10	35	5,1	●	○
4701US-M8-6H		2P	M8	1,25	8	6,3	90	13	35	6,8	●	○
4701UCS-M8-6H	✻	2P	M8	1,25	8	6,3	90	13	35	6,8	○	○
4701US-M10-6H		2P	M10	1,5	10	8	100	15	39	8,5	●	○
4701UCS-M10-6H	✻	2P	M10	1,5	10	8	100	15	39	8,5	○	○

● Ex stock ○ On demand
✻ With internal cooling

→ Square dimension □**a** see table on page C22

Application field

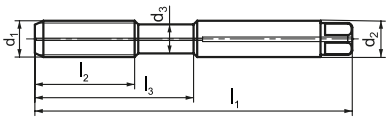
P	M	K	N	S	H
✔	✔	✔	✔	✔	

✔ Very suitable
✔ Suitable

HSS machine taps — ISO metric coarse thread

4601US

– 40° right-hand spiral flute: form C
– Shank type: DIN 376
– Blind hole thread



Article	✻	Dimensions [mm]								Ø Drill	Grade	
			d_1	P	d_2	d_3	l_1	l_2	l_3	d	HG23	HG43
4601US-M8-6H		2P	M8	1,25	6	5,5	90	13	45	6,8	●	○
4601UCS-M8-6H	✻	2P	M8	1,25	6	5,5	90	13	45	6,8	○	○
4601US-M10-6H		2P	M10	1,5	7	6,5	100	15	50	8,5	●	○
4601UCS-M10-6H	✻	2P	M10	1,5	7	6,5	100	15	50	8,5	○	○
4601US-M12-6H		2P	M12	1,75	9	8,5	110	18	55	10,2	●	○
4601UCS-M12-6H	✻	2P	M12	1,75	9	8,5	110	18	55	10,2	○	○
4601US-M14-6H		2P	M14	2	11	10,5	110	20	55	12	●	○
4601UCS-M14-6H	✻	2P	M14	2	11	10,5	110	20	55	12	○	○
4601US-M16-6H		2P	M16	2	12	11,5	110	20	55	14	●	○
4601UCS-M16-6H	✻	2P	M16	2	12	11,5	110	20	55	14	○	○
4601US-M18-6H		2P	M18	2,5	14	13,5	125	25	65	15,5	●	○
4601UCS-M18-6H	✻	2P	M18	2,5	14	13,5	125	25	65	15,5	○	○
4601US-M20-6H		2P	M20	2,5	16	15,5	140	25	70	17,5	●	○
4601UCS-M20-6H	✻	2P	M20	2,5	16	15,5	140	25	70	17,5	○	○
4601US-M22-6H		2P	M22	2,5	18	17,5	140	25	70	19,5	●	○
4601UCS-M22-6H	✻	2P	M22	2,5	18	17,5	140	25	70	19,5	○	○
4601US-M24-6H		2P	M24	3	18	17,5	160	30	80	21	●	○
4601UCS-M24-6H	✻	2P	M24	3	18	17,5	160	30	80	21	○	○

● Ex stock ○ On demand

→ Square dimension □**a** see table on page C22

✻ With internal cooling

Application field

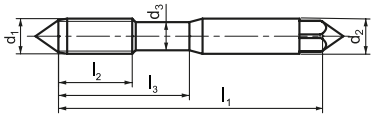
P	M	K	N	S	H
✔	✔	✔	✔	✔	

✔ Very suitable
✔ Suitable

HSS machine taps ISO metric coarse thread

4702U

– Spiral point (form B)
– Shank type: DIN 371
– Through hole thread



Article	✲	Dimensions [mm]								Ø Drill	Grade	
			d_1	P	d_2	d_3	l_1	l_2	l_3	d	HG23	HG43
4702U-M3-6H		4P	M3	0,5	3,5	2,22	56	7,5	18	2,5	●	○
4702U-M4-6H		4P	M4	0,7	4,5	2,9	63	9,5	21	3,3	●	○
4702U-M5-6H		4P	M5	0,8	6	3,65	70	12,5	25	4,2	●	○
4702U-M6-6H		4P	M6	1	6	4,6	80	14,8	30	5,1	●	○
4702U-M8-6H		4P	M8	1,25	8	6,3	90	17,8	35	6,8	●	○
4702UC-M8-6H	✲	4P	M8	1,25	8	6,3	90	17,8	35	6,8	○	○
4702U-M10-6H		4P	M10	1,5	10	8	100	19,8	39	8,5	●	○
4702UC-M10-6H	✲	4P	M10	1,5	10	8	100	19,8	39	8,5	○	○

● Ex stock ○ On demand
✲ With internal cooling

→ Square dimension □a see table on page C22

Application field

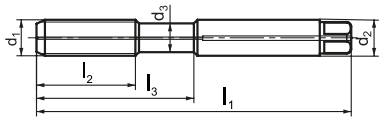
P	M	K	N	S	H
✔	✔	✔	✔	✔	

✔ Very suitable
✔ Suitable

HSS machine taps — ISO metric coarse thread

4602U

– Spiral point (form B)
– Shank type: DIN 376
– Through hole thread



Article	✻	Dimensions [mm]								Ø Drill	Grade	
			d_1	P	d_2	d_3	l_1	l_2	l_3	d	HG23	HG43
4602U-M8-6H		4P	M8	1,25	6	5,8	90	17,8	35	6,8	●	○
4602UC-M8-6H	✻	4P	M8	1,25	6	5,8	90	17,8	35	6,8	○	○
4602U-M10-6H		4P	M10	1,5	7	6,8	100	19,8	39	8,5	●	○
4602UC-M10-6H	✻	4P	M10	1,5	7	6,8	100	19,8	39	8,5	○	○
4602U-M12-6H		4P	M12	1,75	9	8,8	110	24,8	42	10,2	●	○
4602UC-M12-6H	✻	4P	M12	1,75	9	8,8	110	24,8	42	10,2	○	○
4602U-M14-6H		4P	M14	2	11	10,5	110	24	50	12	●	○
4602UC-M14-6H	✻	4P	M14	2	11	10,5	110	24	50	12	○	○
4602U-M16-6H		4P	M16	2	12	11,5	110	26	52	14	●	○
4602UC-M16-6H	✻	4P	M16	2	12	11,5	110	26	52	14	○	○
4602U-M18-6H		4P	M18	2,5	14	13,5	125	31	57	15,5	●	○
4602UC-M18-6H	✻	4P	M18	2,5	14	13,5	125	31	57	15,5	○	○
4602U-M20-6H		4P	M20	2,5	16	15,5	140	31	57	17,5	●	○
4602UC-M20-6H	✻	4P	M20	2,5	16	15,5	140	31	57	17,5	○	○
4602U-M22-6H		4P	M22	2,5	18	17,5	140	32	58	19,5	●	○
4602UC-M22-6H	✻	4P	M22	2,5	18	17,5	140	32	58	19,5	○	○
4602U-M24-6H		4P	M24	3	18	17,5	160	39	65	21	●	○
4602UC-M24-6H	✻	4P	M24	3	18	17,5	160	39	65	21	○	○

● Ex stock ○ On demand
✻ With internal cooling

→ Square dimension □**a** see table on page C22

Application field

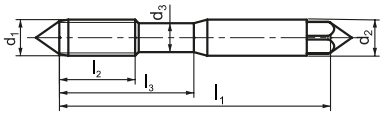
P	M	K	N	S	H
✔	✔	✔	✔	✔	

✔ Very suitable
✔ Suitable

HSS machine taps ISO metric fine thread

4701US

– 40° right-hand spiral flute: form C
– Shank type: DIN 371
– Blind hole thread



Article	✻	Dimensions [mm]								Ø Drill	Grade	
			d_1	P	d_2	d_3	l_1	l_2	l_3	d	HG23	HG43
4701US-M3*0.35-6H		2P	M3	0,35	3,5	2,22	56	5	18	2,65	●	○
4701US-M4*0.5-6H		2P	M4	0,5	4,5	2,9	63	7	21	3,5	●	○
4701US-M5*0.5-6H		2P	M5	0,5	6	3,65	70	8	25	4,5	●	○
4701US-M6*0.5-6H		2P	M6	0,5	6	4,6	80	10	35	5,5	●	○
4701US-M6*0.75-6H		2P	M6	0,75	6	4,6	80	10	35	5,25	●	○
4701US-M8*0.75-6H		2P	M8	0,75	8	6,3	80	13	35	7,25	●	○
4701UCS-M8*0.75-6H	✻	2P	M8	0,75	8	6,3	80	13	35	7,25	○	○
4701US-M8*1-6H		2P	M8	1	8	6,3	90	13	35	7	●	○
4701UCS-M8*1-6H	✻	2P	M8	1	8	6,3	90	13	35	7	○	○
4701US-M10*0.75-6H		2P	M10	0,75	10	8	90	15	39	9,25	●	○
4701UCS-M10*0.75-6H	✻	2P	M10	0,75	10	8	90	15	39	9,25	○	○
4701US-M10*1-6H		2P	M10	1	10	8	90	15	39	9	●	○
4701UCS-M10*1-6H	✻	2P	M10	1	10	8	90	15	39	9	○	○
4701US-M10*1.25-6H		2P	M10	1,25	10	8	100	15	39	8,75	●	○
4701UCS-M10*1.25-6H	✻	2P	M10	1,25	10	8	100	15	39	8,75	○	○

● Ex stock ○ On demand
✻ With internal cooling

→ Square dimension □a see table on page C22

Application field

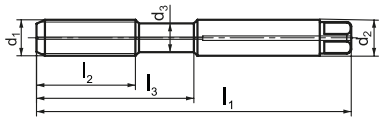
P	M	K	N	S	H
✔	✔	✔	✔	✔	

✔ Very suitable
✔ Suitable

HSS machine taps ISO metric fine thread

4401U

– 40° right-hand spiral flute: form C
– Shank type: DIN 374
– Blind hole thread



Article	✻	Dimensions [mm]								Ø Drill	Grade
			d_1	P	d_2	d_3	l_1	l_2	l_3	d	HG23
4401US-M12*1-6H		2P	M12	1	9	8,5	100	18	50	11	●
4401US-M12*1.5-6H		2P	M12	1,5	9	8,5	100	18	50	10,5	●
4401US-M14*1-6H		2P	M14	1	11	10,5	100	15	50	13	○
4401US-M14*1.5-6H		2P	M14	1,5	11	10,5	100	20	50	12,5	●
4401US-M16*1-6H		2P	M16	1	12	11,5	100	15	50	15	○
4401US-M16*1.5-6H		2P	M16	1,5	12	11,5	100	20	50	14,5	●
4401US-M18*1-6H		2P	M18	1	14	13,5	110	15	55	17	○
4401US-M18*1.5-6H		2P	M18	1,5	14	13,5	110	25	55	16,5	●
4401US-M18*2-6H		2P	M18	2	14	13,5	125	25	65	16	○
4401US-M20*1-6H		2P	M20	1	16	15,5	125	15	65	19	○
4401US-M20*1.5-6H		2P	M20	1,5	16	15,5	125	25	65	18,5	●
4401US-M20*2-6H		2P	M20	2	16	15,5	140	25	70	18	○
4401US-M22*1-6H		2P	M22	1	18	17,5	125	15	65	21	○
4401US-M22*1.5-6H		2P	M22	1,5	18	17,5	125	25	65	20,5	●
4401US-M22*2-6H		2P	M22	2	18	17,5	140	25	70	20	○
4401US-M24*1-6H		2P	M24	1	18	17,5	140	15	70	23	○
4401US-M24*1.5-6H		2P	M24	1,5	18	17,5	140	30	70	22,5	●
4401US-M24*2-6H		2P	M24	2	18	17,5	140	30	70	22	○

● Ex stock ○ On demand

→ Square dimension □**a** see table on page C22

✻ With internal cooling

Application field

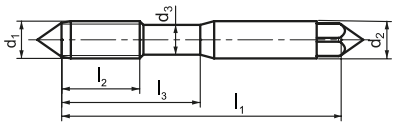
P	M	K	N	S	H
✔	✔	✔	✔	✔	

✔ Very suitable
✔ Suitable

HSS machine taps ISO metric fine thread

4702U

– Spiral point (form B)
– Shank type: DIN 371
– Through hole thread



Article	✲	Dimensions [mm]								Ø Drill	Grade	
			d_1	P	d_2	d_3	l_1	l_2	l_3	d	HG23	HG43
4702U-M3*0.35-6H		4P	M3	0,35	3,5	2,22	56	7,5	18	2,65	●	○
4702U-M4*0.5-6H		4P	M4	0,5	4,5	2,9	63	9,5	21	3,5	●	○
4702U-M5*0.5-6H		4P	M5	0,5	6	3,65	70	12,5	25	4,5	●	○
4702U-M6*0.5-6H		4P	M6	0,5	6	4,6	80	14,8	30	5,5	○	○
4702U-M6*0.75-6H		4P	M6	0,75	6	4,6	80	14,8	30	5,25	●	○
4702U-M8*0.75-6H		4P	M8	0,75	8	6,3	80	14,8	35	7,25	●	○
4702UC-M8*0.75-6H	✲	4P	M8	0,75	8	6,3	80	14,8	35	7,25	○	○
4702U-M8*1-6H		4P	M8	1	8	6,3	90	17,8	35	7	●	○
4702UC-M8*1-6H	✲	4P	M8	1	8	6,3	90	17,8	35	7	○	○
4702U-M10*0.75-6H		4P	M10	0,75	10	8	90	16,8	39	9,25	●	○
4702UC-M10*0.75-6H	✲	4P	M10	0,75	10	8	90	16,8	39	9,25	○	○
4702U-M10*1-6H		4P	M10	1	10	8	90	16,8	39	9	●	○
4702UC-M10*1-6H	✲	4P	M10	1	10	8	90	16,8	39	9	○	○
4702U-M10*1.25-6H		4P	M10	1,25	10	8	100	19,8	39	8,75	●	○
4702UC-M10*1.25-6H	✲	4P	M10	1,25	10	8	100	19,8	39	8,75	○	○

● Ex stock ○ On demand

→ Square dimension □**a** see table on page C22

✲ With internal cooling

Application field

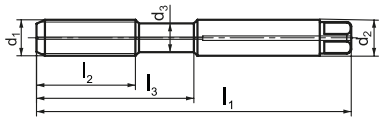
P	M	K	N	S	H
✔	✔	✔	✔	✔	

✔ Very suitable
✔ Suitable

HSS machine taps — ISO metric fine thread

4402U

– Spiral point (form B)
– Shank type: DIN 374
– Through hole thread



Article	✻	Dimensions [mm]								Ø Drill	Grade
			d_1	P	d_2	d_3	l_1	l_2	l_3	d	HG23
4402U-M12*1-6H		4P	M12	1	9	8,8	100	24,8	37	11	●
4402U-M12*1.5-6H		4P	M12	1,5	9	8,8	100	24,8	42	10,5	○
4402U-M14*1-6H		4P	M14	1	11	10,5	100	22	37	13	●
4402U-M14*1.5-6H		4P	M14	1,5	11	10,5	100	24	45	12,5	○
4402U-M16*1-6H		4P	M16	1	12	11,5	100	22	37	15	●
4402U-M16*1.5-6H		4P	M16	1,5	12	11,5	100	26	47	14,5	○
4402U-M18*1-6H		4P	M18	1	14	13,5	110	22	37	17	●
4402U-M18*1.5-6H		4P	M18	1,5	14	13,5	110	31	52	16,5	○
4402U-M18*2-6H		4P	M18	2	14	13,5	125	31	52	16	●
4402U-M20*1-6H		4P	M20	1	16	15,5	125	22	37	19	○
4402U-M20*1.5-6H		4P	M20	1,5	16	15,5	125	31	52	18,5	●
4402U-M20*2-6H		4P	M20	2	16	15,5	140	31	52	18	○
4402U-M22*1-6H		4P	M22	1	18	17,5	125	24	39	21	●
4402U-M22*1.5-6H		4P	M22	1,5	18	17,5	125	32	53	20,5	○
4402U-M22*2-6H		4P	M22	2	18	17,5	140	32	53	20	●
4402U-M24*1-6H		4P	M24	1	18	17,5	140	24	39	23	○
4402U-M24*1.5-6H		4P	M24	1,5	18	17,5	140	39	60	22,5	●
4402U-M24*2-6H		4P	M24	2	18	17,5	140	39	60	22	○

● Ex stock ○ On demand → Square dimension □**a** see table on page C22

✻ With internal cooling

Application field

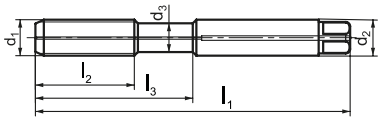
P	M	K	N	S	H
✔	✔	✔	✔	✔	

✔ Very suitable
✔ Suitable

HSS machine taps Whitworth pipe thread DIN ISO 228

4301US

– 40° right-hand spiral flute: form C
– Shank type: DIN 5156
– Blind hole thread



Article	✻	G	Dimensions [mm]								Ø Drill	Grade
				d_1	P	d_2	d_3	l_1	l_2	l_3	d	HG23
4301US-G1/8-28-6H		G1/8–28	2-3	9,728	0,907	7	6,5	90	20	45	8,8	●
4301US-G1/4-19-6H		G1/4–19	2-3	13,157	1,337	11	10,5	100	22	50	11,8	●
4301US-G3/8-19-6H		G3/8–19	2-3	16,662	1,337	12	11,5	100	22	50	15,25	●
4301US-G1/2-14-6H		G1/2–14	2-3	20,955	1,814	16	15,5	125	25	65	19	●
4301US-G3/4-14-6H		G3/4–14	2-3	26,441	1,814	20	19,5	140	28	70	24,5	●
4301US-G1-11-6H		G1–11	2-3	33,249	2,309	25	24,5	160	30	80	30,75	●

● Ex stock ○ On demand
✻ With internal cooling

→ Square dimension □**a** see table on page C22

Application field

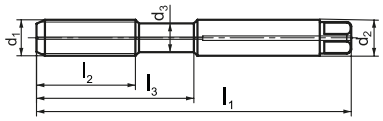
P	M	K	N	S	H
✔	✔	✔	✔	✔	

✔ Very suitable
✔ Suitable

HSS machine taps — Whitworth pipe thread DIN ISO 228

4302U

– Spiral point (form B)
– Shank type: DIN 5156
– Through hole thread



Article	✻	G	Dimensions [mm]								Ø Drill	Grade
				d_1	P	d_2	d_3	l_1	l_2	l_3	d	HG23
4302U-G1/8-28-6H		G1/8–28	3-4	9,728	0,907	7	6,5	90	20	45	8,8	●
4302U-G1/4-19-6H		G1/4–19	3-4	13,157	1,337	11	10,5	100	22	50	11,8	●
4302U-G3/8-19-6H		G3/8–19	3-4	16,662	1,337	12	11,5	100	22	50	15,25	●
4302U-G1/2-14-6H		G1/2–14	3-4	20,955	1,814	16	15,5	125	25	65	19	●
4302U-G3/4-14-6H		G3/4–14	3-4	26,441	1,814	20	19,5	140	28	70	24,5	●
4302U-G1-11-6H		G1–11	3-4	33,249	2,309	25	24,5	160	30	80	30,75	●

● Ex stock ○ On demand
✻ With internal cooling

→ Square dimension ☐**a** see table on page C22

Application field

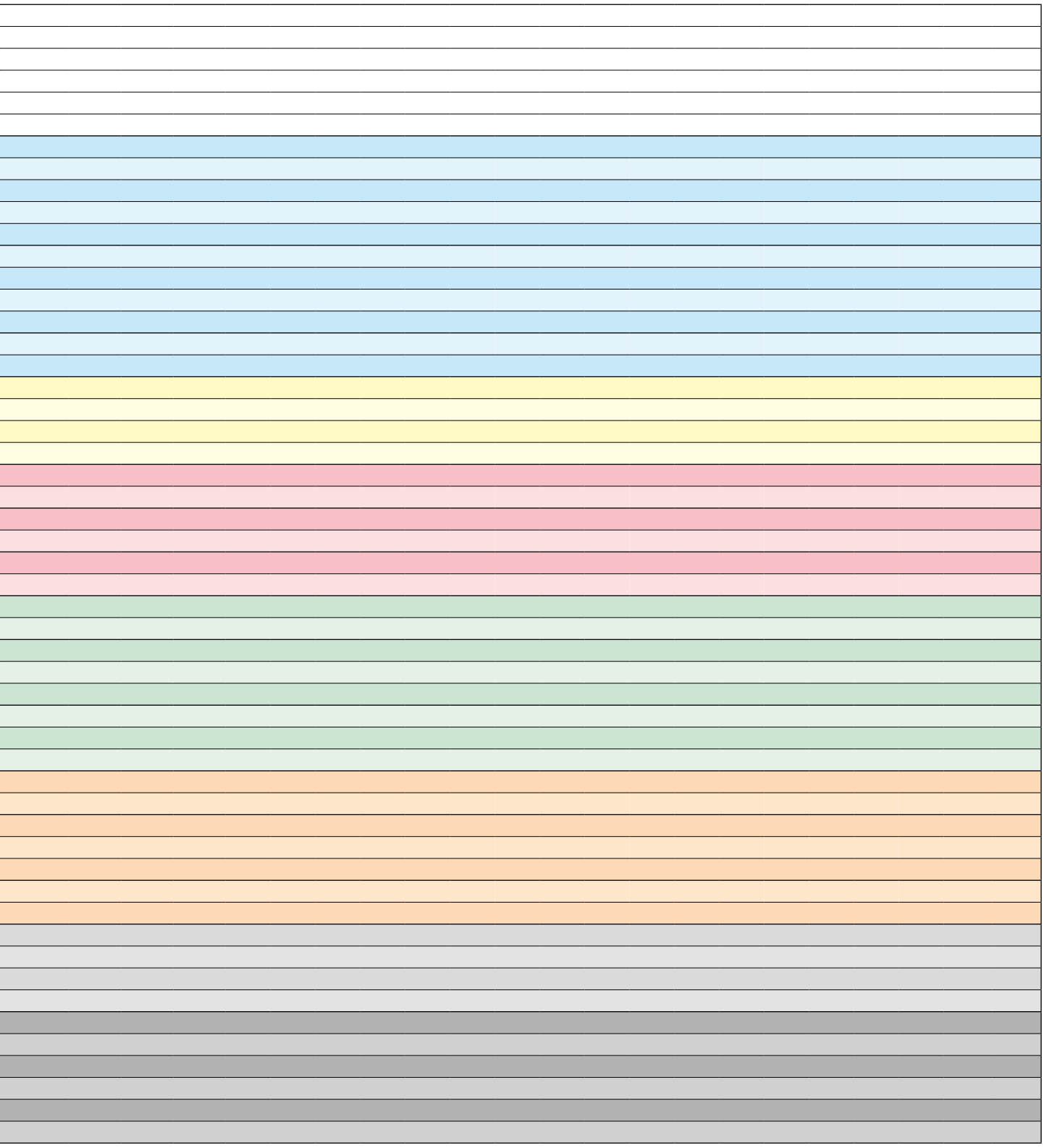
P	M	K	N	S	H
✔	✔	✔	✔	✔	

✔ Very suitable
✔ Suitable

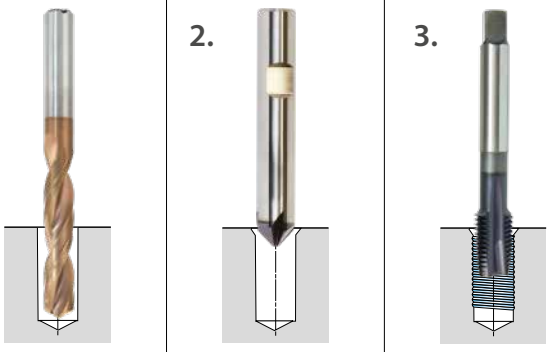
HSS machine taps

Material group		Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]							
						HSS-E	HSS-E	HSS-PM	HSS-PM				
						TiAlN	TiAlN	TiAlN	TiAlN				
						Coolant							
						Ext.	IC	Ext.	IC				
P	Unalloyed steel	approx. 0,15 % C	annealed	125	1	8-18	9-20	15-25	17-27				
		approx. 0,45 % C	annealed	190	2	8-18	9-20	15-25	17-27				
		approx. 0,45 % C	tempered	250	3	8-18	9-20	15-25	17-27				
		approx. 0,75 % C	annealed	270	4	5-16	9-20	10-20	17-27				
		approx. 0,75 % C	tempered	300	5	5-16	9-20	10-20	17-27				
	Low-alloyed steel		annealed	180	6	5-16	9-20	10-20	17-27				
			tempered	275	7	5-16	9-20	10-20	17-27				
			tempered	300	8	5-16	9-20	10-20	17-27				
			tempered	350	9	5-16	9-20	10-20	17-27				
	High-alloyed steel and high-alloyed tool steel		annealed	200	10	5-16	9-20	10-20	17-27				
			hardened and tempered	325	11								
M	Stainless steel	ferritic/martensitic	annealed	200	12	5-12	6-14	8-18	9-20				
		martensitic	tempered	240	13	5-12	6-14	8-18	9-20				
		austenitic	quench hardened	180	14	5-10	6-14	8-18	9-20				
		austenitic-ferritic		230	15	5-10	6-14	8-18	9-20				
K	Grey cast iron	perlitic/ferritic		180	16	9-14	10-16	9-16	10-18				
		perlitic (martensitic)		260	17	9-14	10-16	9-16	10-18				
	Cast iron with spheroidal graphite	ferritic		160	18	9-14	10-16	9-16	10-18				
		perlitic		250	19	9-14	10-16	9-16	10-18				
	Malleable cast iron	ferritic		130	20	9-14	10-16	9-16	10-18				
		perlitic		230	21	9-14	10-16	9-16	10-18				
N	Aluminium wrought alloys	cannot be hardened		60	22	10-20	12-24	15-25	17-27				
		hardenable	hardened	100	23	10-20	12-24	15-25	17-27				
	Cast aluminium alloys	≤ 12 % Si, cannot be hardened		75	24	10-20	12-24	15-25	17-27				
		≤ 12 % Si, hardenable	hardened	90	25	10-20	12-24	15-25	17-27				
		> 12 % Si, cannot be hardened		130	26	10-20	12-24	15-25	17-27				
	Copper and copper alloys (bronze/brass)	machining steel, PB> 1%		110	27	10-20	12-24	15-25	17-27				
		CuZn, CuSnZn		90	28	10-20	12-24	15-25	17-27				
		CuSn, Pb-free copper, electrolytic copper		100	29	10-20	12-24	15-25	17-27				
S	Heat-resistant alloys	Fe-based alloys	annealed	200	30	5-10	6-11	8-15	9-17				
			hardened	280	31	5-10	6-11	8-15	9-17				
		Ni or Co bass	annealed	250	32	5-10	6-11	8-15	9-17				
			hardened	350	33	5-10	6-11	8-15	9-17				
			cast	320	34	5-10	6-11	8-15	9-17				
	Titanium alloys	pure titanium		R_m 400	35	5-10	6-11	8-15	9-17				
		α and β alloys	hardened	R_m 1050	36	5-10	6-11	8-15	9-17				
H	Hardened steel		hardened and tempered	55 HRC	37								
			hardened and tempered	60 HRC	38								
	Hard cast iron		cast	400	39								
	Hardened cast iron		hardened and tempered	55 HRC	40								
X	Non-metallic materials	Thermoplasts			41								
		Thermosetting plastics			42								
		Plastic, glass-fibre reinforced GFRP			43								
		Plastic, carbon fibre reinforced CFRP			44								
		Graphite			45								
		Wood			46								

Note: The given cutting values are guide values, which were determined under ideal conditions.
The values have to be adapted in individual cases.



Correct way to tap



1. Drill core hole
2. Chamfer core hole
3. Tap: The thread is created by the rotation of the tool, with the feed rate corresponding to the pitch.

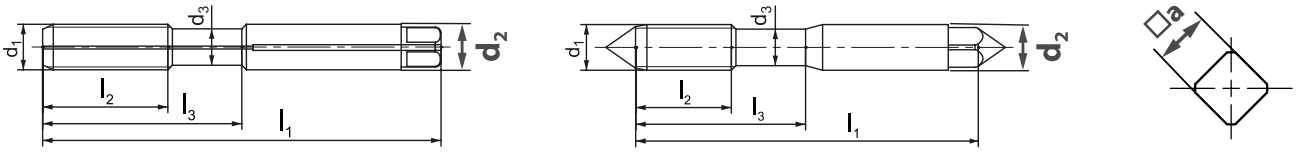
Please note: To select the right tool, you will need to precisely define the thread requirements. When choosing the machining strategy, the form, pitch and direction of the thread are critical factors. The specific properties of the material also play a crucial role during planning.

Threading – Further information

There are a variety of machining strategies used in the metal working industry to produce top-quality components.
Threading comes with its own set of challenges. Contact us to find out more about related applications and the associated requirements.

See our website for more information

Square dimension □a



d_2 [mm]	3,5	4,5	6	7	8	9	10	11–12	14	16	18	20	25
□a [mm]	2,7	3,4	4,9	5,5	6,2	7	8	9	11	12	14,5	16	20

Tapping tools from ZCC Cutting Tools

ZCC Cutting Tools offers a number of tools for use in producing threads. These include:

SU series		GD series	SL series	FM series		
Solid carbide step drills (custom-made drills also available)	Solid carbide universal drills	Solid carbide twist drills	Solid carbide deep hole drills	60° solid carbide deburring cutters	90° solid carbide deburring cutters	120° solid carbide deburring cutters
						

HSS machine taps		Solid carbide threading tools	
HSS-E/HSS-PM bottoming taps	HSS-E/HSS-PM through taps	Thread formers	Thread mills
			

Notes

HSS-E centre drills

C

HSS-E centre drills

Centre hole according to DIN 332, form A / form R

YOUR BENEFITS

– Best value for your money
– Consistent production results with high fracture toughness
– Universal tool for use with a range of materials

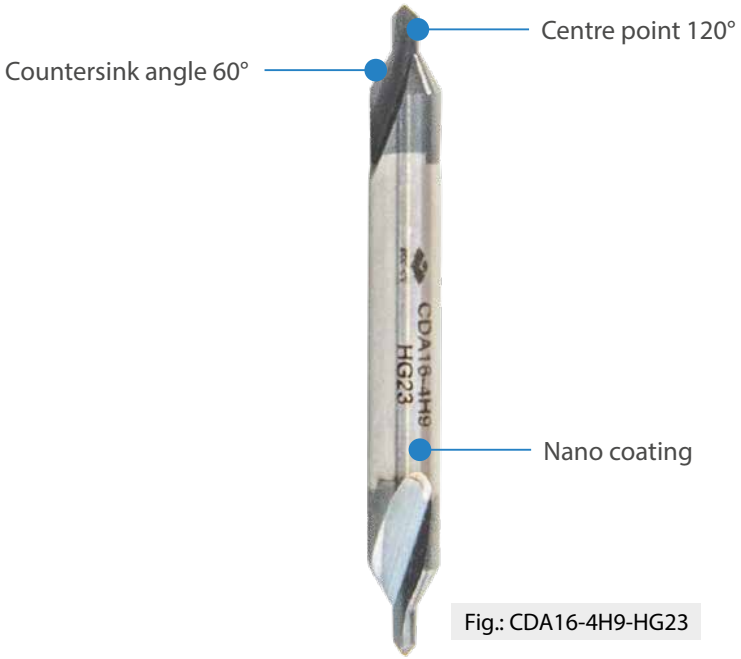


Fig.: CDA16-4H9-HG23

Technical specifications

– Centre drill DIN 333, form A / form R
– Centre point: 120°
– Countersink angle: 60°
– **HG23:** coated HSS-E
– **HD20:** uncoated HSS-E

Ordering information

– Common sizes from Ø1–4 mm in assortment
– Available in sets of 10
– Available from stock

CD	A	2	–	5	H9	HG23
1	2	3		4	5	6

Type	
Code	Description
CD	Centre drills DIN 333

1

Shank type	
Code	Description
A	Form A
R	Form B
5	Straight shank DIN 6535 HA
9	Conical shank
4	DIN 374
6	DIN 376
7	DIN 371
3	DIN 5156

2

Diameter d [mm]

3

Shank diameter D [mm]

4

Shank tolerance

5

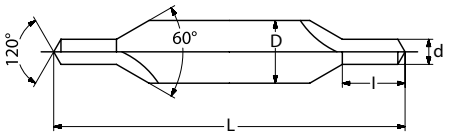
Grade	
Code	Description
HG23	Coated
HD20	Uncoated

6

HSS-E centre drills DIN 333, Form A

CDA**

– Shank type: DIN 333
– Form A
– Countersink angle 60°



Article	Dimensions [mm]				Grade		⚠ Packing unit (PU)
	d	D	L	l	HG23	HD20	
CDA1-315H9	1	3,15	31,5	1,3	●	●	10
CDA16-4H9	1,6	4	35,5	2	●	●	10
CDA2-5H9	2	5	40	2,5	●	●	10
CDA25-63H9	2,5	6,3	45	3,1	●	●	10
CDA315-8H9	3,15	8	50	3,9	●	●	10
CDA4-10H9	4	10	56	5	●	●	10

● Ex stock ○ On demand
✻ With internal cooling

Application field

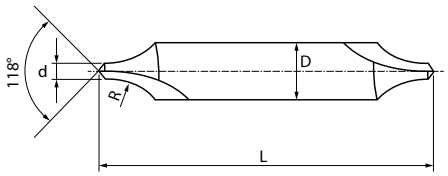
P	M	K	N	S	H
✔	✔	✔	✔	✔	

✔ Very suitable
✔ Suitable

HSS-E centre drills DIN 333, Form R

CDR**

– Shank type: DIN 333
– Form R



Article	Dimensions [mm]					Grade	⚠ Packing unit (PU)
	d	D	L	R_{min}	R_{max}	HG23	
CDR1-315H9	1	3,15	31,5	2,5	3,15	○	10
CDR16-4H9	1,6	4	35,5	4	5	○	10
CDR2-5H9	2	5	40	5	6,3	○	10
CDR25-63H9	2,5	6,3	45	6,3	8	○	10
CDR315-8H9	3,15	8	50	8	10	●	10
CDR4-10H9	4	10	56	12,5	10	○	10

● Ex stock ○ On demand
✻ With internal cooling

Application field

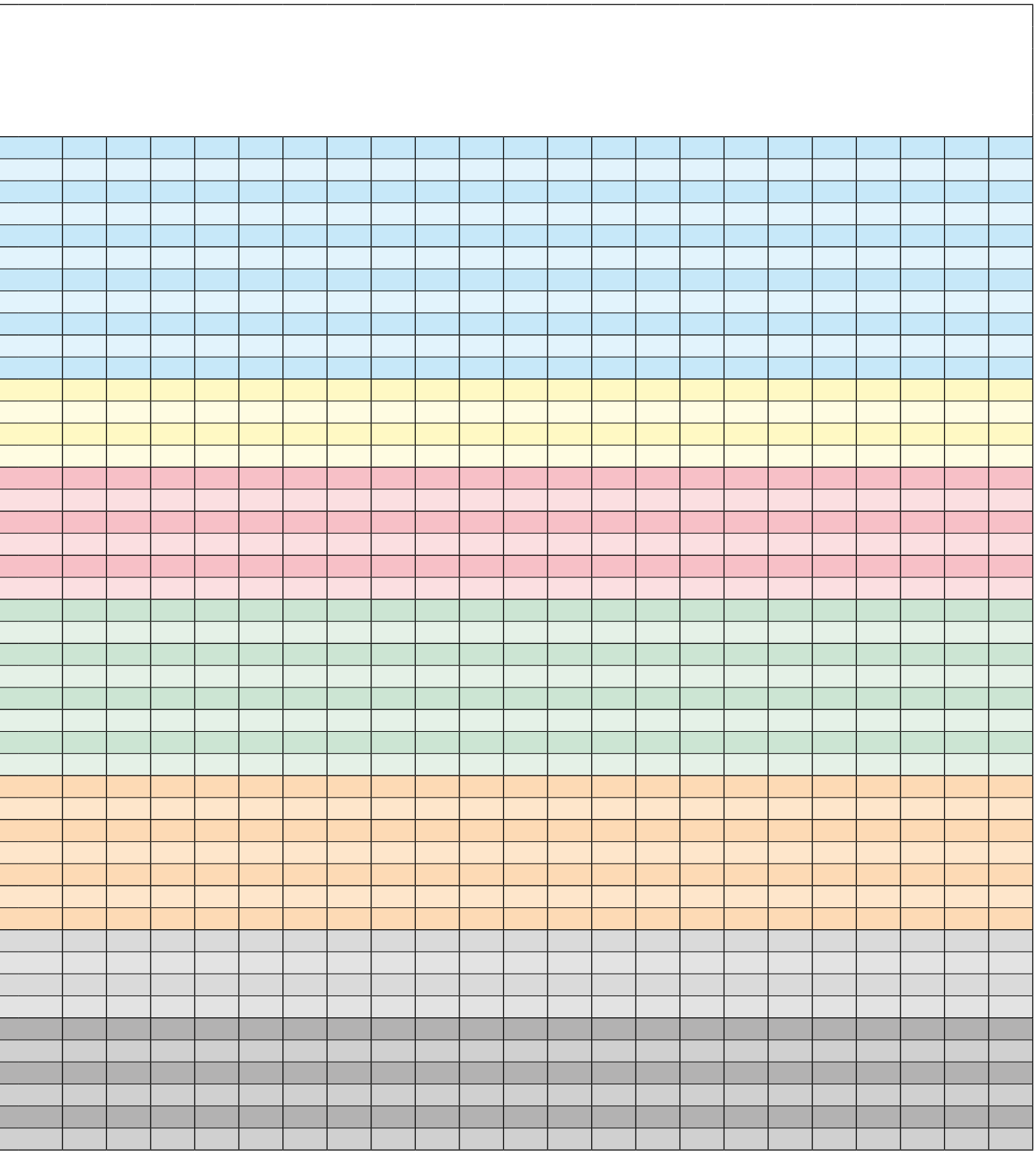
P	M	K	N	S	H
✔	✔	✔	✔	✔	

✔ Very suitable
✔ Suitable

HSS-E centre drills

Material group		Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]					
						Uncoated		Coated			
								TiAlN			
						V_c [m/min]	f [mm]	V_c [m/min]	f [mm]		
						Ø1–4 [mm]		Ø1–4 [mm]			
P	Unalloyed steel	approx. 0,15 % C	annealed	125	1	55	0,04–0,15	75	0,05–0,18		
		approx. 0,45 % C	annealed	190	2	50	0,04–0,15	70	0,05–0,18		
		approx. 0,45 % C	tempered	250	3	48	0,04–0,15	70	0,05–0,18		
		approx. 0,75 % C	annealed	270	4	45	0,04–0,15	65	0,05–0,18		
		approx. 0,75 % C	tempered	300	5	42	0,04–0,15	50	0,05–0,18		
	Low-alloyed steel		annealed	180	6	53	0,04–0,15	70	0,05–0,18		
			tempered	275	7	45	0,04–0,15	60	0,05–0,18		
			tempered	300	8	42	0,04–0,15	50	0,05–0,18		
			tempered	350	9	40	0,04–0,15	45	0,05–0,18		
	High-alloyed steel and high-alloyed tool steel		annealed	200	10	50	0,04–0,15	42	0,05–0,18		
			hardened and tempered	325	11	30	0,04–0,15	35	0,05–0,18		
M	Stainless steel	ferritic/martensitic	annealed	200	12	22	0,03–0,05	25	0,03–0,06		
		martensitic	tempered	240	13	22	0,03–0,05	25	0,03–0,06		
		austenitic	quench hardened	180	14	22	0,03–0,05	25	0,03–0,06		
		austenitic-ferritic		230	15	22	0,03–0,05	25	0,03–0,06		
K	Grey cast iron	perlitic/ferritic		180	16	50	0,028–0,13	85	0,03–0,17		
		perlitic (martensitic)		260	17	42	0,028–0,13	80	0,03–0,17		
	Cast iron with spheroidal graphite	ferritic		160	18	60	0,028–0,13	90	0,03–0,17		
		perlitic		250	19	42	0,028–0,13	75	0,03–0,17		
	Malleable cast iron	ferritic		130	20	55	0,028–0,13	75	0,03–0,17		
		perlitic		230	21	40	0,028–0,13	65	0,03–0,17		
N	Aluminium wrought alloys	cannot be hardened		60	22	130	0,01–0,11	130	0,012–0,13		
		hardenable	hardened	100	23	130	0,01–0,11	130	0,012–0,13		
	Cast aluminium alloys	≤ 12 % Si, cannot be hardened		75	24	115	0,01–0,11	115	0,012–0,13		
		≤ 12 % Si, hardenable	hardened	90	25	100	0,01–0,11	100	0,012–0,13		
		> 12 % Si, cannot be hardened		130	26	80	0,01–0,11	80	0,012–0,13		
	Copper and copper alloys (bronze/brass)	machining steel, PB> 1%		110	27	85	0,01–0,11	85	0,012–0,13		
		CuZn, CuSnZn		90	28	100	0,01–0,11	100	0,012–0,13		
		CuSn, Pb-free copper, electrolytic copper		100	29	90	0,01–0,11	90	0,012–0,13		
S	Heat-resistant alloys	Fe-based alloys	annealed	200	30	30	0,004–0,03	38	0,004–0,03		
			hardened	280	31	15	0,004–0,03	19	0,004–0,03		
		Ni or Co bass	annealed	250	32	27	0,004–0,03	32	0,004–0,03		
			hardened	350	33	16	0,004–0,03	20	0,004–0,03		
			cast	320	34	15	0,004–0,03	15	0,004–0,03		
	Titanium alloys	pure titanium		R_m 400	35						
		α and β alloys	hardened	R_m 1050	36						
H	Hardened steel		hardened and tempered	55 HRC	37						
			hardened and tempered	60 HRC	38						
	Hard cast iron		cast	400	39						
	Hardened cast iron		hardened and tempered	55 HRC	40						
X	Non-metallic materials	Thermoplasts			41						
		Thermosetting plastics			42						
		Plastic, glass-fibre reinforced GFRP			43						
		Plastic, carbon fibre reinforced CFRP			44						
		Graphite			45						
		Wood			46						

Note: The given cutting values are guide values, which were determined under ideal conditions.
The values have to be adapted in individual cases.



Notes

HSS countersinks

C

HSS countersinks

Countersink according to DIN 335 / 334, form C

YOUR BENEFITS

– **Low-vibration cutting conditions** thanks to spiralized cutting edge
– Significant **reduction in feed forces** thanks to soft cutting and the resulting **perfectly round countersinks** without chatter marks
– Universally applicable in different materials
– **Secure tension** thanks to three-faced shank
– Optimal price-performance ratio

Fig.: SC90F-20.5 HG21

Technical information

– Spiralized countersink DIN 335 (90°), DIN 334 (60°), form C
– Short and long version
– Countersink angle: 60°, 90°
– Three-faced shank
– **HG11:** coated HSS
– **HG21:** coated HSS-E

Ordering Information

– Common sizes from Ø6.3–40 mm in the range
– Available **in a set of 6** or **individually**
– Ø 6.3–40 mm available from stock
– Ø 4.3–5 mm on request

SC	90	F	SET-6	HG21
1	2	3	4	5

Type	
Code	Description
SC	Spiralized countersink

1

Form	
Code	Description
90	DIN 335
60	DIN 334

2

Shank type	
Code	Description
Z	Cylindrical shank form C
F	Surface shank form C

3

Diametre [mm]	
Code	Description
20.5	20,5
6.3	6,3
12.4	12,4
SET-6	Set of 6 pieces
SET-6L	Set of 6 pieces, long version

4

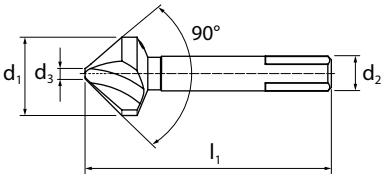
Grade	
Code	Description
HG11	HSS coated
HG21	HSS-E coated

5

HSS countersinks DIN 335, form C

SC90F**

– Shank type: DIN 335, form C with 3 surfaces
– Countersink angle 90°
– Equal pitch



Article	Dimensions [mm]				Grade	
	d1	d2	d3	l1	HG11	HG21
SC90F-4.3	4,3	4	1,3	40	–	○
SC90F-4.5	4,5	4	1,4	40	–	○
SC90F-4.8	4,8	4	1,5	40	–	○
SC90F-5	5	4	1,5	40	–	○
SC90F-6.3	6,3	5	1,5	45	●	●
SC90F-8.3	8,3	6	2	50	●	●
SC90F-10.4	10,4	6	2,5	50	●	●
SC90F-12.4	12,4	8	2,8	56	●	●
SC90F-16.5	16,5	10	3,2	60	●	●
SC90F-20.5	20,5	10	3,5	63	●	●
SC90F-SET-6	–	–	–	–	●	●
SC90F-25	25	10	3,8	67	○	●
SC90F-31	31	12	4,2	71	○	●
SC90F-40	40	12	10	75	○	●

● Ex stock ○ On demand
✻ With internal cooling

Application field

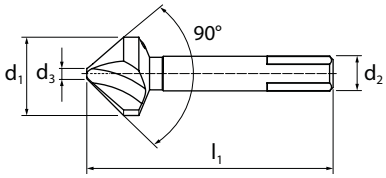
P	M	K	N	S	H
✔	✔	✔	✔	✔	

✔ Very suitable
✔ Suitable

HSS countersinks, long DIN 335, form C

SC90F**L**

– Shank type: DIN 335, form C with 3 surfaces
– Countersink angle 90°
– Equal pitch



Article	Dimensions [mm]				Grade	
	d1	d2	d3	l1	HG11	HG21
SC90F-6.3L	6,3	5	1,5	104	–	●
SC90F-8.3L	8,3	6	2	105	–	●
SC90F-10.4L	10,4	6	2,5	107	–	●
SC90F-12.4L	12,4	8	2,8	108	–	●
SC90F-16.5L	16,5	10	3,2	111	–	●
SC90F-20.5L	20,5	10	3,5	114	–	●
SC90F-SET-6L	–	–	–	–	–	●
SC90F-25L	25	10	3,8	118	–	●
SC90F-31L	31	12	4,2	140	–	●

● Ex stock ○ On demand
✻ With internal cooling

Application field

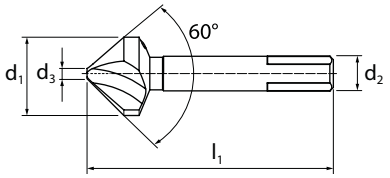
P	M	K	N	S	H
✔	✔	✔	✔	✔	

✔ Very suitable
✔ Suitable

HSS countersinks DIN 334, form C

SC60F**

– Shank type: DIN 334, form C with 3 surfaces
– Countersink angle 60°
– Equal pitch



Article	Dimensions [mm]				Grade	
	d1	d2	d3	l1	HG11	HG21
SC60F-6.3	6,3	5	1,5	45	–	●
SC60F-8.3	8,3	6	2	50	–	●
SC60F-10.4	10,4	6	2,5	50	–	●
SC60F-12.4	12,4	8	2,8	56	–	●
SC60F-16.5	16,5	10	3,2	60	–	●
SC60F-20.5	20,5	10	3,5	63	–	●
SC60F-SET-6	–	–	–	–	–	●
SC60F-25	25	3,8	67	10	–	●
SC60F-31	31	4,2	71	12	–	●

● Ex stock ○ On demand
✻ With internal cooling

Application field

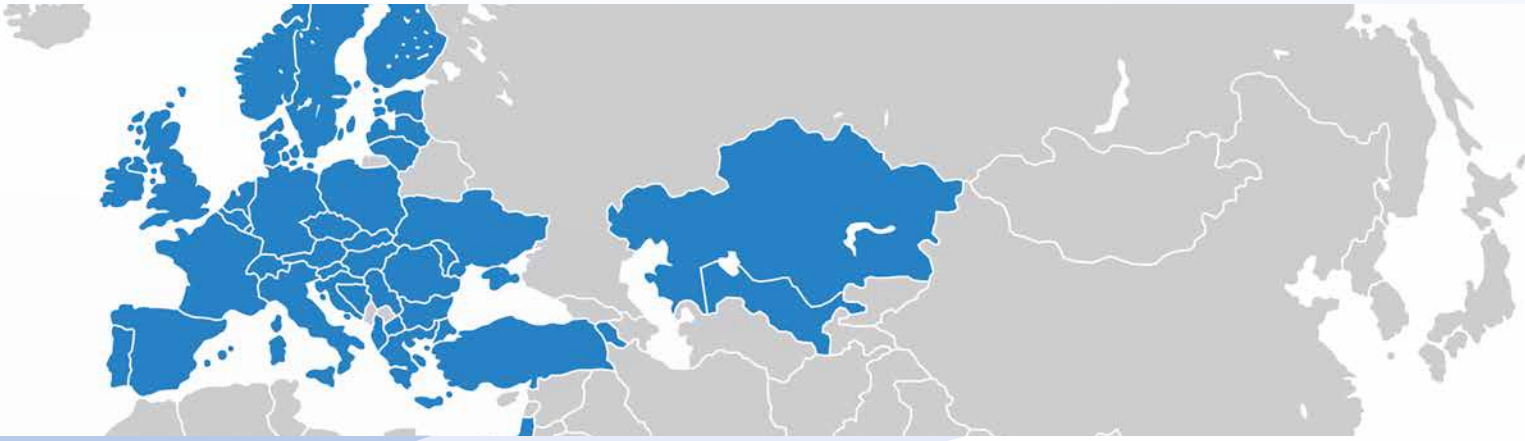
P	M	K	N	S	H
✔	✔	✔	✔	✔	

✔ Very suitable
✔ Suitable

Notes

HSS tools

Machine taps, centre drills, counter sinks



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