



HSS machine taps

Complementing the solid carbide range



– EN –



ZCC Cutting Tools Europe GmbH

your Partner | your Value

The Company

Zhuzhou Cemented Carbide Cutting Tools Co., Ltd. (ZCC-CT) is located in Zhuzhou, Hunan in the People's Republic of China is the largest Chinese manufacturer of carbide tools. ZCC-CT belongs to the Zhuzhou Cemented Carbide Group (ZCC), which manufactures carbide products and carbide powders. Both companies are part of the Minmetals Corporation, which Trades in mining metals and minerals.

Since its founding in 1953, ZCC Cutting Tools has become one of the world's leading carbide manufacturers and has more than 2,000 employees, thanks to its highly qualified staff and use of the latest technologies. As a Minmetals Corporation company, ZCC-CT can completely cover the entire value-added chain of modern carbide tool production from the extraction of raw materials to the coated final product and all the steps in between.

Based on the latest European production technologies, it is possible for us to offer products with a consistent high quality at all times. The extensive product range includes carbide indexable inserts, indexable inserts made from cermet, CBN, PKD and ceramic, solid carbide tools as well as turning tool holders and suitable tool systems. The products are produced in accordance with the current international standards, such as ISO, DIN, ANSI, JIS and BSI. In addition, ZCC Cutting Tools offer customer-specific solutions and special carbide products in accordance with specifications.

Research and development are a very high priority at ZCC-CT. In this area ZCC-CT use the world's most modern equipment and advanced machinery from Germany and Switzerland, for which the investments are higher than average. With highly trained engineers and a qualified international team, ZCC Cutting Tools researches the necessary foundations and is constantly developing new and improved products based on them. The company continuously strives to improve quality in order to meet customers' growing demands for new and innovative products and to be able to individually enhance customer benefits.

Both production and administration in China are subject to the ISO 9001:2008 standard. Environmental management is subject to the ISO 14001:2004 standard.

Since 2003, ZCC Cutting Tools has had a branch office in Europe.

The European head office and central warehouse are located in Düsseldorf, Germany. All European countries as well as Russia and Turkey are serviced from there. The company's quality management system is certified in the area of sales and logistics of tools for metal processing in accordance with DIN EN ISO 9001:2008.

In order to meet our own high requirements for above-average customer service and in parallel with the growth of the company as a whole, the number of employees at ZCC Cutting Tools is growing in sales and internal sales, in technical support and application technology, research and development as well as in the areas of logistic, marketing, IT, human resources and accounting.

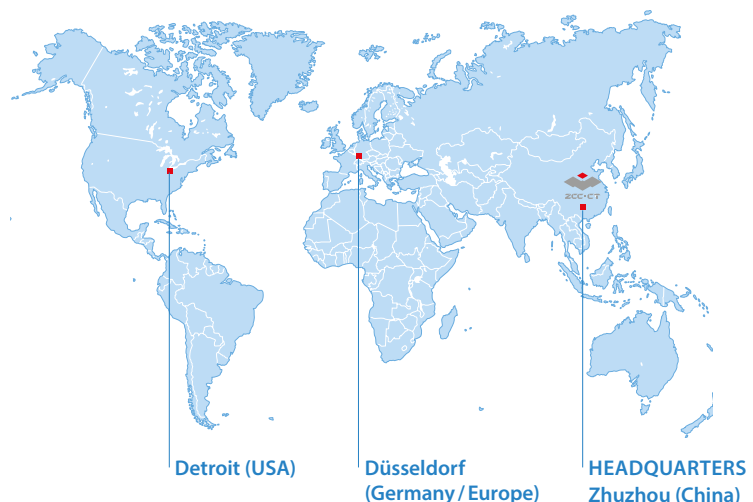
Our sales representatives and our sales partners in Europe together serve customers on site. ZCC-CT application engineers are furthermore available with all their expertise and experience by phone, email or personally in your production environment.

The internal sales team handles enquiries throughout Europe with native speakers and ensures together with the employees in logistics that all orders are delivered to you and all our customers as fast as possible.

All of us at ZCC Cutting Tools Europe are here for you and will support you as your competent partner in all questions of machining production. That is our definition of added value through partnership.



Member of Minmetals Group



HSS threading tools

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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/mm².

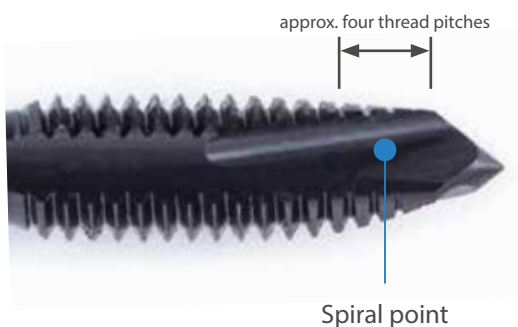
HSS-PM Long tool life for consistent results in mass-production operations

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.
HG43	PVD coated HSS-E 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.

Chamfer forms acc. to DIN 2197

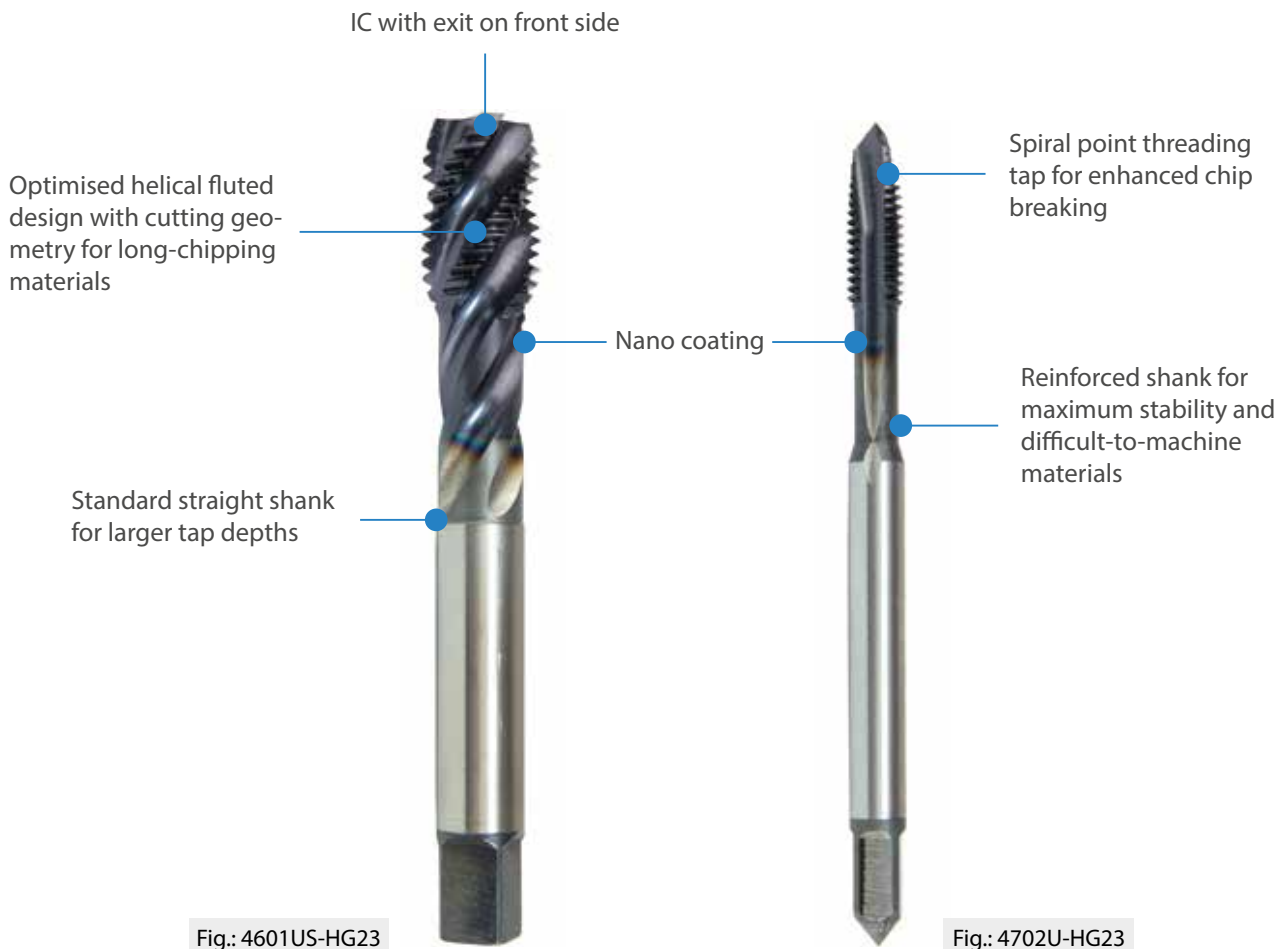


YOUR BENEFITS

- 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 for through threads and form C for bottoming threads
- Shank type: DIN 371 \leq M10 and DIN 376 \geq M8
- With or without internal cooling
- Internal cooling with exit on front side from M8
- All types are coated with TiAlN
- 6H tolerance: standard tolerance
- 6HX tolerance: tighter manufacturing tolerance (available on request)



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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
4702U		M3-M10	✓	✓	✓	✓	✓		ISO metric fine thread	C14

✓ Very suitable ✓ Suitable

Notes

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4 7 0 1 U (C) (S) – M10×1 – 6H HG23

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A

Turning

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

2

B

Milling

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

C

Drilling

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

D

Technical Information

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)

8

E

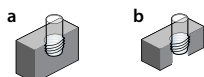
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Precision class	
Code	Description
6H	Nominal diameter x pitch
6HX	Fine production tolerance

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Grade	
	Description
	HG23
	HG43

10



a Bottoming thread

b Through tap

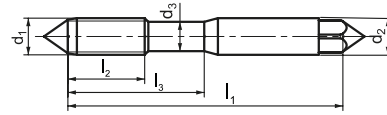
HSS machine taps

ISO metric coarse thread

4701US



- 40° right-hand spiral flute: form C
- Shank type: DIN 371
- Bottoming 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

Application field					
P	M	K	N	S	H
✓	✓	✓	✓	✓	

- ✓ Very suitable
- ✓ Suitable

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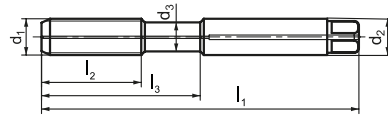
HSS machine taps

ISO metric coarse thread

4601US



- 40° right-hand spiral flute: form C
- Shank type: DIN 376
- Bottoming thread



Article	*	Dimensions [mm]								Ø Drill	Grade	
		$\frac{1}{2}$	d ₁	P	d ₂	d ₃	l ₁	l ₂	l ₃		d	HG23
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

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓	✓	✓	

✓ Very suitable

✓ Suitable

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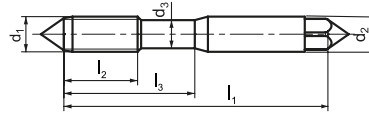
HSS machine taps

ISO metric coarse thread

4702U



- Spiral point (form B)
- Shank type: DIN 371
- Through tap



Article	*	Dimensions [mm]									Ø Drill		Grade	
		$\frac{Z}{P}$	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

Application field					
P	M	K	N	S	H
✓	✓	✓	✓	✓	

- ✓ Very suitable
- ✓ Suitable

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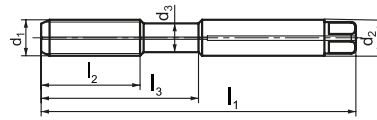
HSS machine taps

ISO metric coarse thread

4602U



- Spiral point (form B)
- Shank type: DIN 376
- Through tap



Article	*	Dimensions [mm]								Ø Drill	Grade	
		$\frac{1}{4}$	d ₁	P	d ₂	d ₃	l ₁	l ₂	l ₃		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

Application field

P	M	K	N	S	H
✓	✓	✓	✓	✓	

✓ Very suitable

✓ Suitable

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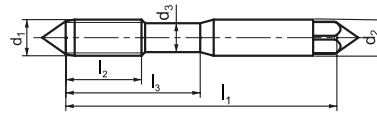
HSS machine taps

ISO metric fine thread

4701US



- 40° right-hand spiral flute: form C
- Shank type: DIN 371
- Bottoming thread



Article	*	Dimensions [mm]								Ø Drill	Grade	
			d ₁	P	d ₂	d ₃	l ₁	l ₂	l ₃		d	HG23
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

Application field					
P	M	K	N	S	H
✓	✓	✓	✓	✓	

- ✓ Very suitable
- ✓ Suitable

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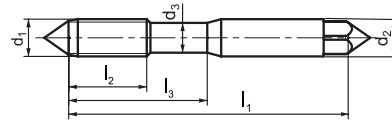
HSS machine taps

ISO metric fine thread

4702U



- Spiral point (form B)
- Shank type: DIN 371
- Through tap



Article	*	Dimensions [mm]								Ø Drill d	Grade	
			d ₁	P	d ₂	d ₃	l ₁	l ₂	l ₃		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

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓	✓	✓	

✓ Very suitable

✓ Suitable

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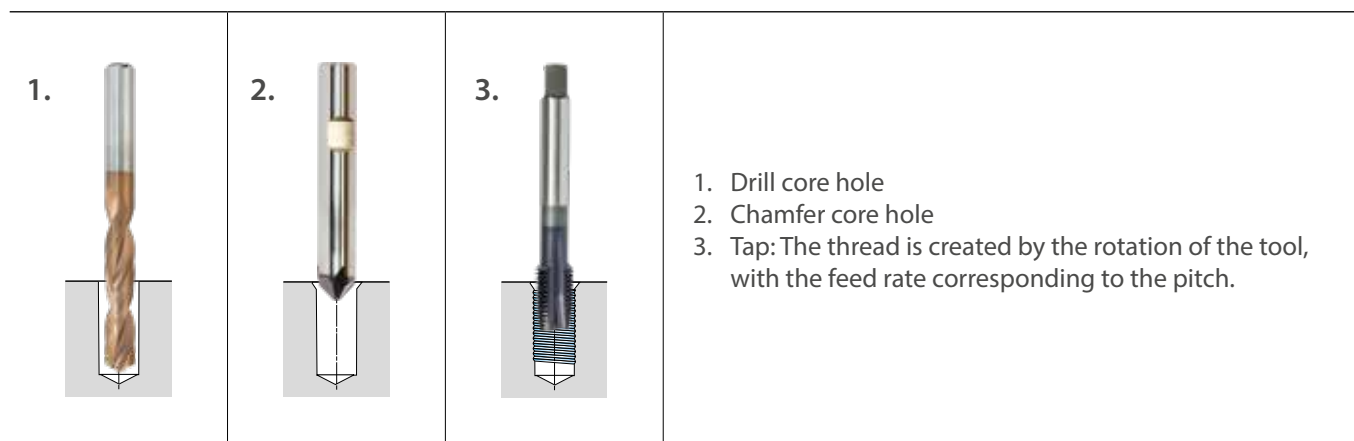
HSS machine taps

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.	f-group	Ext.	f-group	Int.	f-group	Ext.	f-group				
P	Unalloyed steel	approx. 0,15 % C	annealed	125	1	8-18		15-25					
		approx. 0,45 % C	annealed	190	2	8-18		15-25					
		approx. 0,45 % C	tempered	250	3	8-18		15-25					
		approx. 0,75 % C	annealed	270	4	5-16		10-20					
		approx. 0,75 % C	tempered	300	5	5-16		10-20					
	Low-alloyed steel		annealed	180	6	5-16		10-20					
			tempered	275	7	5-16		10-20					
			tempered	300	8	5-16		10-20					
			tempered	350	9	5-16		10-20					
	High-alloyed steel and high-alloyed tool steel		annealed	200	10	5-16		10-20					
			hardened and tempered	325	11								
M	Stainless steel	ferritic/martensitic	annealed	200	12	5-12		8-18					
		martensitic	tempered	240	13	5-12		8-18					
		austenitic	quench hardened	180	14	5-10		8-18					
		austenitic-ferritic		230	15	5-10		8-18					
K	Grey cast iron	perlitic/ferritic		180	16	9-14		9-16					
		perlitic (martensitic)		260	17	9-14		9-16					
	Cast iron with spheroidal graphite	ferritic		160	18	9-14		9-16					
		perlitic		250	19	9-14		9-16					
	Malleable cast iron	ferritic		130	20	9-14		9-16					
		perlitic		230	21	9-14		9-16					
N	Aluminium wrought alloys	cannot be hardened		60	22	10-20		15-25					
		hardenable	hardened	100	23	10-20		15-25					
	Cast aluminium alloys	$\leq 12\%$ Si, cannot be hardened		75	24	10-20		15-25					
		$\leq 12\%$ Si, hardenable	hardened	90	25	10-20		15-25					
		$> 12\%$ Si, cannot be hardened		130	26	10-20		15-25					
	Copper and copper alloys (bronze/brass)	machining steel, PB > 1%			110	27	10-20		15-25				
		CuZn, CuSnZn			90	28	10-20		15-25				
CuSn, Pb-free copper, electrolytic copper			100	29	10-20		15-25						
S	Heat-resistant alloys	Fe-based alloys	annealed	200	30	5-10		8-15					
			hardened	280	31	5-10		8-15					
		Ni or Co bass	annealed	250	32	5-10		8-15					
			hardened	350	33	5-10		8-15					
	Titanium alloys	cast	320	34	5-10		8-15						
pure titanium			R _m 400	35	5-10		8-15						
	α and β alloys	hardened	R _m 1050	36	5-10		8-15						
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.
 With hole depths of 5xD adjust the cutting data accordingly to the application.
 f-group = feed rate recommendations on page C140.
 For examples of material for cutting tool groups view page D22.

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Correct way to tap



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.

Key information on threading

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

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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 <small>New</small>	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
			

Please refer to the **General Catalogue 2019** and **Product Innovations 09/20** for more information on these tools:



General Catalogue 2019



Product Innovations 09/20

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Scan for PDF

HSS machine taps

Complementing the solid carbide range



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