

The image features three forming taps. Two are shown in the upper left, angled towards the right, highlighting their double-flute design. The third tap is positioned vertically in the lower center, actively threading a hole into a metal workpiece. The background is a dark gradient with a blurred industrial scene, possibly a factory floor with machinery and lights. A diagonal blue and red gradient bar runs across the bottom of the image.

Forming Taps

Chip-free internal threading tools

Distributed By Noahs Ark Precision India Pvt Ltd
Email: sales@nshark.in

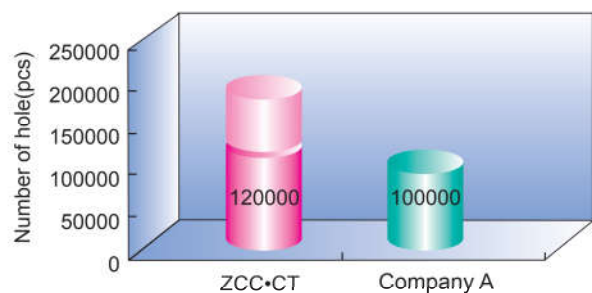
- ◆ Super micro grain cemented carbide with good toughness and abrasion resistance has long tool life.
- ◆ With particularly section-sharp design has good rigidity and strength.
- ◆ Thanks to the special technique treatment on cutting edge surface, ensuring good threading machining quality and high dimensional accuracy.

It is apply for high efficiency through-hole and blind-hole machining of high tensility material such as soft steel, stainless steel, Al alloys and cast Al alloy, etc.

Application case

Work piece: auto engine shell
 Work piece material: Al alloy (HB90~120)
 Tool type: 4222ACS-M10×1.25-6H
 Cutting parameters: n=1300r/min
 F=1625mm/min
 h=29mm, through hole or blind hole machining
 Machining tool: horizontal machining center
 Cooling style: emulsified liquid cooling

Comparison of hole number



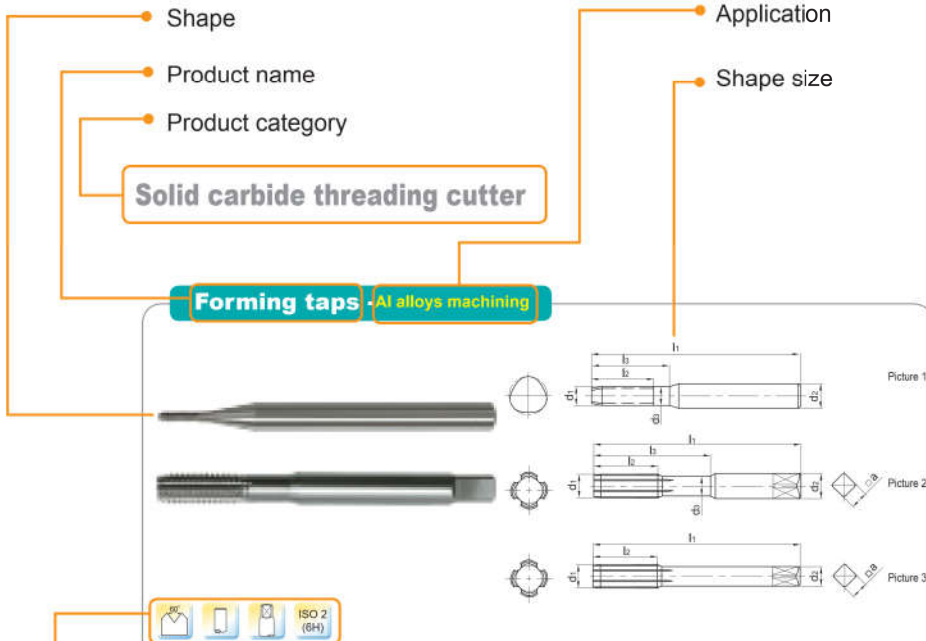
ZCC•CT: 120000 holes (still usable)
 Company A: 100000 holes (failure)



BORING TOOL Threading tools

How to choose the right solid carbide threading tools

How to choose the right solid carbide threading tools



Type	Cooling mode	Basic dimension(mm)											Grade		Pre-hole diameter d			
		Length of Forming taper	d ₁	P	d ₂	d ₃	l ₁	l ₂	l ₃	a × a	Thread profile	Geometry	Number of teeth	KTG402		YK40F		
4122M-M1*0.25-6H	External coolant	3P	M1	0.25	3		40	5					60°		4	●	○	0.9
4122MS-M1*0.25-6H		2P	M1	0.25	3		40	5					60°	Picture 1	4	●	○	0.9
4122M-M1.2*0.25-6H		3P	M1.2	0.25	3		40	5					60°		4	●	○	1.1
4122MS-M1.2*0.25-6H		2P	M1.2	0.25	3		40	5					60°	Picture 1	4	●	○	1.1
4122M-M1.6*0.35-6H		3P	M1.6	0.35	3	1.1	40	5	11				60°		4	●	○	1.47
4122MS-M1.6*0.35-6H		2P	M1.6	0.35	3	1.1	40	5	11				60°	Picture 1	4	●	○	1.47
4122M-M2*0.4-6H		3P	M2	0.4	3	1.5	45	6	12				60°		4	●	○	1.85
4122MS-M2*0.4-6H		2P	M2	0.4	3	1.5	45	6	12				60°	Picture 1	4	●	○	1.85
4122M-M2.5*0.45-6H		3P	M2.5	0.45	3	1.9	50	6	14				60°		4	●	○	2.33
4122MS-M2.5*0.45-6H		2P	M2.5	0.45	3	1.9	50	6	14				60°	Picture 1	4	●	○	2.33
4222M-M3*0.5-6H		3P	M3	0.5	3.5	2.3	56	6	18	2.7			60°		4	●	○	2.8
4222MS-M3*0.5-6H		2P	M3	0.5	3.5	2.3	56	6	18	2.7			60°	Picture 2	4	●	○	2.8
4222M-M4*0.5-6H		3P	M4	0.5	4.5	3.1	63	8	21	3.4			60°		4	●	○	3.8
4222MS-M4*0.5-6H		2P	M4	0.5	4.5	3.1	63	8	21	3.4			60°	Picture 2	4	●	○	3.8
4222M-M4*0.7-6H		3P	M4	0.7	4.5	3.1	63	8	21	3.4			60°		4	●	○	3.7
4222MS-M4*0.7-6H		2P	M4	0.7	4.5	3.1	63	8	21	3.4			60°	Picture 2	4	●	○	3.7
4222M-M5*0.5-6H		3P	M5	0.5	6	4.3	70	10	25	4.9			60°		4	●	○	4.8
4222MS-M5*0.5-6H		2P	M5	0.5	6	4.3	70	10	25	4.9			60°	Picture 2	4	●	○	4.8

● Stock available ○ Make-to-order

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel ~40HRC	~50HRC	~60HRC	Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
KTG402	●					●					
YK40F	○					○			○		



- Applicable workpiece material range
- Thread profile angle, shank type, precision class
- Specification: Type, basic dimensions, number of tooth and grade.
- Code key, cutting parameter, technical information, Non-standard customization



BORING TOOL



Threading tools

Solid carbide threading tools overview ● C160

**Icons information of solid carbide
threading tools** ● C160

Code key of solid carbide threading tools ● C161

**Detail information of solid carbide
threading tools** ● C162-C175

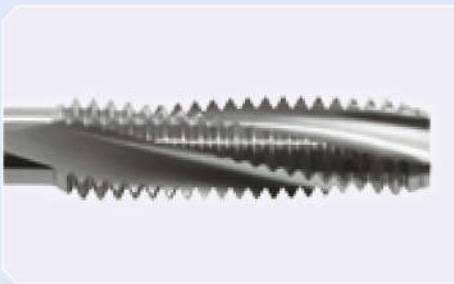
Solid carbide threading cutters ● C162-C173

Solid carbide threading end mills ● C174-C175

**Recommended cutting parameters of solid
carbide threading tools** ● C176

**Technical information of solid carbide
threading tools** ● C177-C182

**Non-standard customization for
threading tools** ● C183-C184





Threading tools overview

Name	Type	Shape	Diameter range	Workpiece material						Page		
				P	M	K	N	S	H	Specification	Cutting parameters	
				Mild steel	Common steel	Stainless steel	Cast iron	Aluminum alloy	Heat resistant steel			High hardness steel
Forming tap	4122A		M1~M2.5					○			C162	C176
	4222A		M3~M16					○			C163	C176
	4122M		M1~M2.5	○		○		○			C164	C176
	4222M		M3~M16	○		○		○			C165	C176
Helical-flute cutting taps	4201C		M3~M16					○			C166-C167	C176
	4201A							○			C170-C171	C176
Straight-flute cutting tap	4202C		M3~M16					○			C168-C169	C176
	4202A							○			C172-C173	C176
Threading end mills	4111		M3~M20	○	○		○	○			C175	C176

○ Very suitable ○ Suitable

Icons information

Shank type



Straight shank



Square straight shank as per DIN10

Thread profile angle of tap



60° shown

Precision class of screw thread



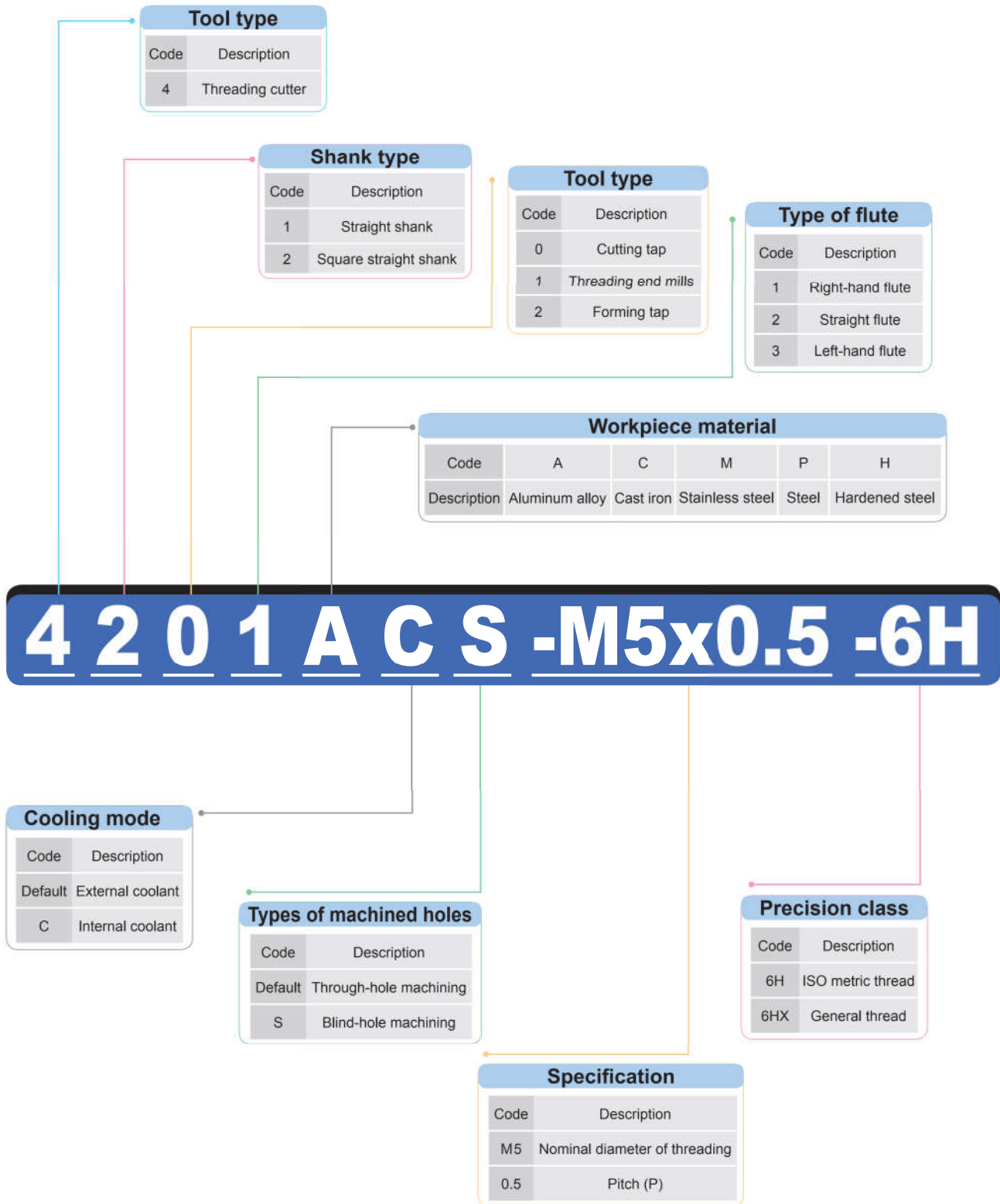
Precision class of screw thread



Precision class of screw thread



Threading tools code key



Drilling tools
Reaming Tools
Threading Cutter

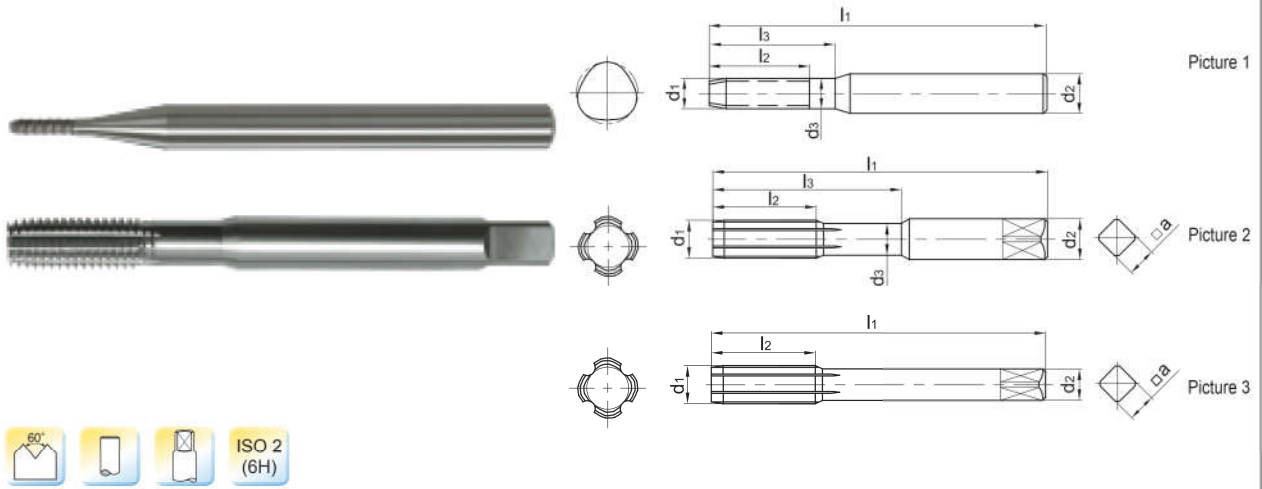
Threading cutter code key



BORING TOOL / Threading tools

Forming taps -Al alloys machining

Forming taps -Al alloys machining



Type	Cooling mode	Basic dimension(mm)											Grade	Pre-hole diameter				
		Length of Forming taper	d ₁	P	d ₂	d ₃	l ₁	l ₂	l ₃	a × a	Thread profile	Geometry			Number of teeth	YK40F	d	
4122A-M1*0.25-6H	External coolant	3P	M1	0.25	3		40	5						Picture 1	3	●	0.9	
4122AS-M1*0.25-6H		1.5P	M1	0.25	3		40	5							3	●	0.9	
4122A-M1.2*0.25-6H		3P	M1.2	0.25	3		40	5						Picture 1	3	●	1.1	
4122AS-M1.2*0.25-6H		1.5P	M1.2	0.25	3		40	5							3	●	1.1	
4122A-M1.6*0.35-6H		3P	M1.6	0.35	3	1.1	40	5	11					Picture 1	3	●	1.47	
4122AS-M1.6*0.35-6H		1.5P	M1.6	0.35	3	1.1	40	5	11						3	●	1.47	
4122A-M2*0.4-6H		3P	M2	0.4	3	1.5	45	6	12					Picture 1	3	●	1.85	
4122AS-M2*0.4-6H		1.5P	M2	0.4	3	1.5	45	6	12						3	●	1.85	
4122A-M2.5*0.45-6H		3P	M2.5	0.45	3	1.9	50	6	14					Picture 1	3	●	2.33	
4122AS-M2.5*0.45-6H		1.5P	M2.5	0.45	3	1.9	50	6	14						3	●	2.33	
4222A-M3*0.5-6H		3P	M3	0.5	3.5	2.3	56	6	18	2.7					Picture 2	4	●	2.8
4222AS-M3*0.5-6H		1.5P																
4222A-M4*0.5-6H		3P	M4	0.5	4.5	3.1	63	8	21	3.4					Picture 2	4	●	3.8
4222AS-M4*0.5-6H		1.5P																
4222A-M4*0.7-6H		3P	M4	0.7	4.5	3.1	63	8	21	3.4					Picture 2	4	●	3.7
4222AS-M4*0.7-6H		1.5P																
4222A-M5*0.5-6H		3P	M5	0.5	6	4.3	70	10	25	4.9					Picture 2	4	●	4.8
4222AS-M5*0.5-6H		1.5P																
4222A-M5*0.8-6H		3P	M5	0.8	6	4	70	10	25	4.9					Picture 2	4	●	4.65
4222AS-M5*0.8-6H		1.5P																
4222A-M6*0.75-6H		3P	M6	0.75	6	5	80	12	30	4.9					Picture 2	4	●	5.7
4222AS-M6*0.75-6H		1.5P																
4222A-M6*1-6H		3P	M6	1	6	4.7	80	12	30	4.9					Picture 2	4	●	5.6
4222AS-M6*1-6H		1.5P																
4222A-M7*1-6H		3P	M7	1	7	5.7	80	14	30	5.5					Picture 2	4	●	6.6
4222AS-M7*1-6H		1.5P																

● Stock available ○ Make-to-order

Drilling tools
 Reaming Tools
 Threading Cutter
 Forming taps-Al alloys machining



Type	Cooling mode	Basic dimension(mm)											Grade	Pre-hole diameter		
		Length of Forming taper	d ₁	P	d ₂	d ₃	l ₁	l ₂	l ₃	a × a	Thread profile	Geometry			Number of teeth	YK40F
4222A-M8*1-6H	External coolant	3P	M8	1	8	6.7	90	16	35	6.2	60°	Picture 2	4	●	7.6	
4222AS-M8*1-6H		1.5P														
4222A-M8*1.25-6H		3P	M8	1.25	8	6.4	90	16	35	6.2		Picture 2	4	●	7.45	
4222AS-M8*1.25-6H		1.5P														
4222A-M10*1-6H		3P	M10	1	10	8.7	100	20	39	8		Picture 2	5	●	9.6	
4222AS-M10*1-6H		1.5P														
4222A-M10*1.25-6H		3P	M10	1.25	10	8.4	100	20	39	8		Picture 2	5	●	9.45	
4222AS-M10*1.25-6H		1.5P														
4222A-M10*1.5-6H		3P	M10	1.5	10	8.1	100	20	39	8		Picture 2	5	●	9.35	
4222AS-M10*1.5-6H		1.5P														
4222AC-M10*1.5-6H		Internal coolant	3P	M12	1.25	9	110	24	7	7		Picture 3	5	●	11.45	
4222ACS-M10*1.5-6H		1.5P														
4222A-M12*1.25-6H		External coolant	3P	M12	1.5	9	110	24	7	7		Picture 3	5	●	11.35	
4222AS-M12*1.25-6H			1.5P													
4222A-M12*1.5-6H			3P	M12	1.75	9	110	24	7	7		Picture 3	5	●	11.25	
4222AS-M12*1.5-6H			1.5P													
4222A-M12*1.75-6H			3P	M12	1.75	9	110	24	7	7		Picture 3	5	●	11.25	
4222AS-M12*1.75-6H			1.5P													
4222AC-M12*1.75-6H			Internal coolant	3P	M14	1.5	11	110	26	9		9	Picture 3	6	●	13.35
4222ACS-M12*1.75-6H			1.5P													
4222A-M14*1.5-6H			External coolant	3P	M14	2	11	110	26	9		9	Picture 3	6	●	13.1
4222AS-M14*1.5-6H				1.5P												
4222A-M14*2-6H				3P	M16	1.5	12	110	27	9		9	Picture 3	6	●	15.35
4222AS-M14*2-6H				1.5P												
4222A-M16*1.5-6H	3P			M16	2	12	110	27	9	9	Picture 3	6	●	15.1		
4222AS-M16*1.5-6H	1.5P															
4222A-M16*2-6H	3P			M16	2	12	110	27	9	9	Picture 3	6	●	15.1		
4222AS-M16*2-6H	1.5P															
4222AC-M16*2-6H	Internal coolant			3P	M16	2	12	110	27	9	9	Picture 3	6	●	15.1	
4222ACS-M16*2-6H	1.5P															

● Stock available ○ Make-to-order

▶▶ Applicable material table

⊙ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
YK40F									⊙		



Drilling tools
Reaming Tools
Threading Cutter

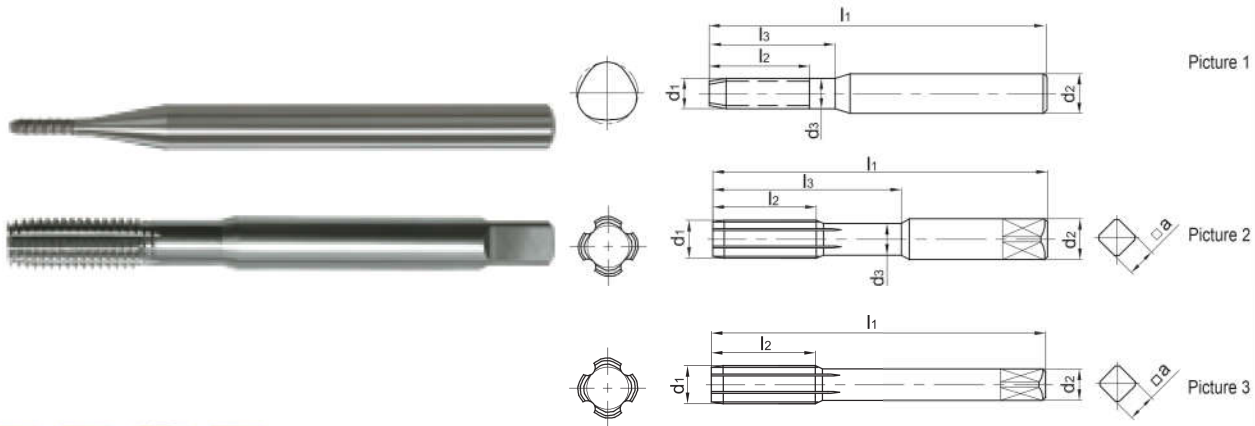
Forming taps-Al alloys machining



BORING TOOL Threading tools

Forming taps -stainless steel machining

Forming taps -stainless steel machining



Type	Cooling mode	Basic dimension(mm)											Grade		Pre-hole diameter d				
		Length of Forming taper	d ₁	P	d ₂	d ₃	l ₁	l ₂	l ₃	a × a	Thread profile	Geometry	Number of teeth	KTG402		YK40F			
4122M-M1*0.25-6H	External coolant	3P	M1	0.25	3		40	5						Picture 1	4	●	○	0.9	
4122MS-M1*0.25-6H		2P	M1	0.25	3		40	5						Picture 1	4	●	○	0.9	
4122M-M1.2*0.25-6H		3P	M1.2	0.25	3		40	5						Picture 1	4	●	○	1.1	
4122MS-M1.2*0.25-6H		2P	M1.2	0.25	3		40	5						Picture 1	4	●	○	1.1	
4122M-M1.6*0.35-6H		3P	M1.6	0.35	3	1.1	40	5	11					Picture 1	4	●	○	1.47	
4122MS-M1.6*0.35-6H		2P	M1.6	0.35	3	1.1	40	5	11					Picture 1	4	●	○	1.47	
4122M-M2*0.4-6H		3P	M2	0.4	3	1.5	45	6	12					Picture 1	4	●	○	1.85	
4122MS-M2*0.4-6H		2P	M2	0.4	3	1.5	45	6	12					Picture 1	4	●	○	1.85	
4122M-M2.5*0.45-6H		3P	M2.5	0.45	3	1.9	50	6	14					Picture 1	4	●	○	2.33	
4122MS-M2.5*0.45-6H		2P	M2.5	0.45	3	1.9	50	6	14					Picture 1	4	●	○	2.33	
4222M-M3*0.5-6H		3P	M3	0.5	3.5	2.3	56	6	18	2.7				60°	Picture 2	4	●	○	2.8
4222MS-M3*0.5-6H		2P													4	●	○	2.8	
4222M-M4*0.5-6H		3P	M4	0.5	4.5	3.1	63	8	21	3.4				60°	Picture 2	4	●	○	3.8
4222MS-M4*0.5-6H		2P													4	●	○	3.8	
4222M-M4*0.7-6H		3P	M4	0.7	4.5	3.1	63	8	21	3.4				60°	Picture 2	4	●	○	3.7
4222MS-M4*0.7-6H		2P													4	●	○	3.7	
4222M-M5*0.5-6H		3P	M5	0.5	6	4.3	70	10	25	4.9				60°	Picture 2	4	●	○	4.8
4222MS-M5*0.5-6H		2P													4	●	○	4.8	
4222M-M5*0.8-6H		3P	M5	0.8	6	4	70	10	25	4.9				60°	Picture 2	4	●	○	4.65
4222MS-M5*0.8-6H		2P													4	●	○	4.65	
4222M-M6*0.75-6H		3P	M6	0.75	6	5	80	12	30	4.9				60°	Picture 2	4	●	○	5.7
4222MS-M6*0.75-6H		2P													4	●	○	5.7	
4222M-M6*1-6H		3P	M6	1	6	4.7	80	12	30	4.9				60°	Picture 2	4	●	○	5.6
4222MS-M6*1-6H		2P													4	●	○	5.6	
4222M-M7*1-6H		3P	M7	1	7	5.7	80	14	30	5.5				60°	Picture 2	4	●	○	6.6
4222MS-M7*1-6H		2P													4	●	○	6.6	

● Stock available ○ Make-to-order

Drilling tools
 Reaming Tools
 Threading Cutter
 Forming taps-stainless steel machining



Type	Cooling mode	Basic dimension(mm)											Grade		Pre-hole diameter	
		Length of Forming taper	d ₁	P	d ₂	d ₃	l ₁	l ₂	l ₃	a×a	Thread profile	Geometry	Number of teeth	KTG402		YK40F
4222M-M8*1-6H	External coolant	3P	M8	1	8	6.7	90	16	35	6.2	60°	Picture 2	4	●	○	7.6
4222MS-M8*1-6H		2P														
4222M-M8*1.25-6H		3P	M8	1.25	8	6.4	90	16	35	6.2		Picture 2	4	●	○	7.45
4222MS-M8*1.25-6H		2P														
4222M-M10*1-6H		3P	M10	1	10	8.7	100	20	39	8		Picture 2	5	●	○	9.6
4222MS-M10*1-6H		2P														
4222M-M10*1.25-6H		3P	M10	1.25	10	8.4	100	20	39	8		Picture 2	5	●	○	9.45
4222MS-M10*1.25-6H		2P														
4222M-M10*1.5-6H		3P	M10	1.5	10	8.1	100	20	39	8		Picture 2	5	●	○	9.35
4222MS-M10*1.5-6H		2P														
4222MC-M10*1.5-6H		Internal coolant	3P	M12	1.25	9	110	24	7	7		Picture 3	5	●	○	11.45
4222MCS-M10*1.5-6H			2P													
4222M-M12*1.5-6H	External coolant	3P	M12	1.5	9	110	24	7	7	Picture 3	5	●	○	11.35		
4222MS-M12*1.5-6H		2P														
4222M-M12*1.75-6H		3P	M12	1.75	9	110	24	7	7	Picture 3	5	●	○	11.25		
4222MS-M12*1.75-6H		2P														
4222MC-M12*1.75-6H	Internal coolant	3P	M14	1.5	11	110	26	9	9	Picture 3	6	●	○	13.35		
4222MCS-M12*1.75-6H		2P														
4222M-M14*1.5-6H	External coolant	3P	M14	2	11	110	26	9	9	Picture 3	6	●	○	13.1		
4222MS-M14*1.5-6H		2P														
4222M-M14*2-6H		3P	M16	1.5	12	110	27	9	9	Picture 3	6	●	○	15.35		
4222MS-M14*2-6H		2P														
4222M-M16*1.5-6H		3P	M16	2	12	110	27	9	9	Picture 3	6	●	○	15.1		
4222MS-M16*1.5-6H		2P														
4222M-M16*2-6H	Internal coolant	3P	M16	2	12	110	27	9	9	Picture 3	6	●	○	15.1		
4222MCS-M16*2-6H		2P														

● Stock available ○ Make-to-order

➤ Applicable material table

○ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KTG402	○					○					
YK40F	○					○			○		



Code key

C161

Cutting parameters

C176

Technical information

C177-C182

Non-standard customization

C183

Drilling tools
Reaming Tools
Threading Cutter

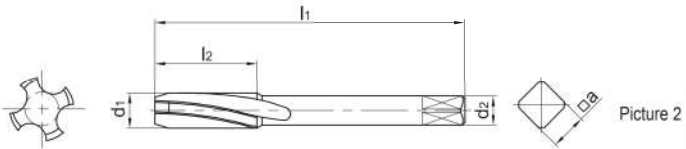
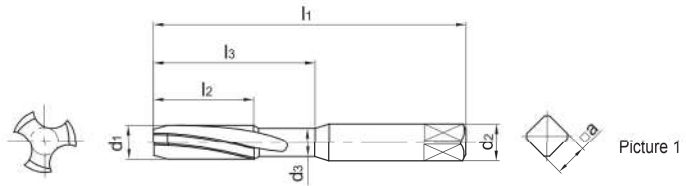
Forming taps-stainless steel machining



BORING TOOL Threading tools

Helical-flute cutting taps - cast iron machining

Helical-flute cutting taps - cast iron machining



Type	Basic dimension(mm)											Grade	Pre-hole diameter												
	Length of Cutting tap	d ₁	P	d ₂	d ₃	l ₁	l ₂	l ₃	a × a	Thread profile	Geometry			Number of teeth	YK40F	d									
4201C-M3*0.5-6H	3P	M3	0.5	3.5	2.3	56	11	18	2.7	60°	Picture 1	3	●	2.5											
4201C-M3*0.5-6HX	3P																								
4201CS-M3*0.5-6H	1.5P																								
4201CS-M3*0.5-6HX	1.5P																								
4201C-M4*0.7-6H	3P	M4	0.7	4.5	3.1	63	13	21	3.4		Picture 1	3	●	3.3											
4201C-M4*0.7-6HX	3P																								
4201CS-M4*0.7-6H	1.5P																								
4201CS-M4*0.7-6HX	1.5P																								
4201C-M5*0.8-6H	3P	M5	0.8	6	4	70	16	25	4.9		Picture 1	3	●	4.2											
4201C-M5*0.8-6HX	3P																								
4201CS-M5*0.8-6H	1.5P																								
4201CS-M5*0.8-6HX	1.5P																								
4201C-M6*0.75-6H	3P	M6	0.75	6	5	80	19	30	4.9	Picture 1	3	●	5.25												
4201C-M6*0.75-6HX	3P																								
4201CS-M6*0.75-6H	1.5P																								
4201CS-M6*0.75-6HX	1.5P																								
4201C-M6*1-6H	3P	M6	1	6	4.7	80	19	30	4.9	Picture 1	3	●	5												
4201CC-M6*1-6H	3P																								
4201C-M6*1-6HX	3P																								
4201CS-M6*1-6H	1.5P																								
4201CCS-M6*1-6H	1.5P																								
4201CS-M6*1-6HX	1.5P																								
4201C-M7*1-6H	3P	M7	1	7	5.7	80	19	30	5.5	Picture 1	3	●	6												
4201CS-M7*1-6H	1.5P																								
4201C-M8*1-6H	3P													M8	1	8	6.7	90	20	35	6.2	Picture 1	3	●	7
4201CS-M8*1-6H	1.5P																								
4201C-M8*1.25-6H	3P																								
4201CC-M8*1.25-6H	3P																								
4201C-M8*1.25-6HX	3P	M8	1.25	8	6.4	90	22	35	6.2	Picture 1	3	●	6.75												
4201CS-M8*1.25-6H	1.5P																								
4201CCS-M8*1.25-6H	1.5P																								
4201CS-M8*1.25-6HX	1.5P																								

● Stock available ○ Make-to-order

Drilling tools
 Reaming Tools
 Threading Cutter
 Helical-flute cutting taps-cast iron machining



Helical-flute cutting taps - cast iron machining

Type	Basic dimension(mm)												Grade	Pre-hole diameter
	Length of Cutting tap	d ₁	P	d ₂	d ₃	l ₁	l ₂	l ₃	a×a	Thread profile	Geometry	Number of teeth	YK40F	d
4201C-M10*1-6H	3P	M10	1	10	8.7	100	20	39	8	60°	Picture 1	4	●	9
4201CS-M10*1-6H	1.5P													
4201C-M10*1.25-6H	3P	M10	1.25	10	8.4	100	24	39	8		Picture 1	4	●	8.75
4201CS-M10*1.25-6H	1.5P													
4201C-M10*1.5-6H	3P	M10	1.5	10	8.1	100	24	39	8		Picture 1	4	●	8.5
4201CC-M10*1.5-6H	3P													
4201C-M10*1.5-6HX	3P													
4201CS-M10*1.5-6H	1.5P													
4201CCS-M10*1.5-6H	1.5P													
4201CS-M10*1.5-6HX	1.5P													
4201C-M12*1.25-6H	3P	M12	1.25	9		110	29		7		Picture 2	4	●	10.75
4201CS-M12*1.25-6H	1.5P													
4201C-M12*1.5-6H	3P	M12	1.5	9		110	29		7			4	●	10.5
4201CS-M12*1.5-6H	1.5P													
4201C-M12*1.75-6H	3P	M12	1.75	9		110	29		7		Picture 2	4	●	10.25
4201CC-M12*1.75-6H	3P													
4201C-M12*1.75-6HX	3P													
4201CS-M12*1.75-6H	1.5P													
4201CCS-M12*1.75-6H	1.5P													
4201CS-M12*1.75-6HX	1.5P													
4201C-M14*1.5-6H	3P	M14	1.5	11		110	30		9	Picture 2	4	●	12.5	
4201CS-M14*1.5-6H	1.5P													
4201C-M14*2-6H	3P	M14	2	11		110	30		9	Picture 2	4	●	12	
4201CS-M14*2-6H	1.5P													
4201C-M16*1.5-6H	3P	M16	1.5	12		110	32		9	Picture 2	4	●	14.5	
4201CS-M16*1.5-6H	1.5P													
4201C-M16*2-6H	3P	M16	2	12		110	32		9	Picture 2	4	●	14	
4201C-M16*2-6HX	3P													
4201CS-M16*2-6H	1.5P													
4201CS-M16*2-6HX	1.5P													

● Stock available ○ Make-to-order

Drilling tools

Reaming Tools

Threading Cutter

Helical-flute cutting taps-cast iron machining

▶▶ Applicable material table

⊙ Very suitable ○ Suitable

Grade	Workpiece material									
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy
YK40F			~40HRC	~50HRC	~60HRC		⊙	⊙		

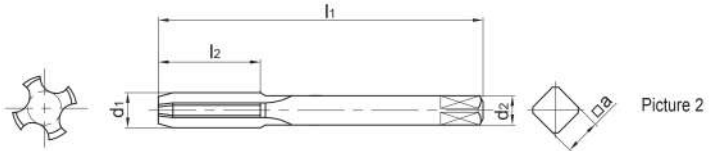
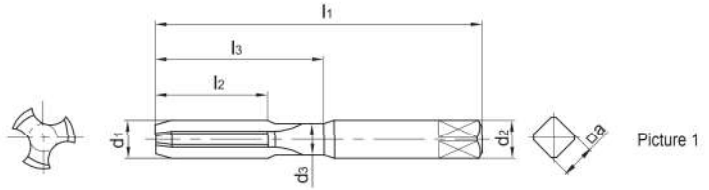




BORING TOOL Threading tools

Straight-flute cutting taps - cast iron machining

Straight-flute cutting taps - cast iron machining



Type	Basic dimension(mm)												Grade	Pre-hole diameter											
	Length of Cutting tap	d ₁	P	d ₂	d ₃	l ₁	l ₂	l ₃	a×a	Thread profile	Geometry	Number of teeth			YK40F	d									
4202C-M3*0.5-6H	3P	M3	0.5	3.5	2.3	56	11	18	2.7	60°	Picture 1	3	●	2.5											
4202C-M3*0.5-6HX	3P																								
4202CS-M3*0.5-6H	1.5P																								
4202CS-M3*0.5-6HX	1.5P																								
4202C-M4*0.7-6H	3P	M4	0.7	4.5	3.1	63	13	21	3.4		Picture 1	3	●	3.3											
4202C-M4*0.7-6HX	3P																								
4202CS-M4*0.7-6H	1.5P																								
4202CS-M4*0.7-6HX	1.5P																								
4202C-M5*0.8-6H	3P	M5	0.8	6	4	70	16	25	4.9		Picture 1	3	●	4.2											
4202C-M5*0.8-6HX	3P																								
4202CS-M5*0.8-6H	1.5P																								
4202CS-M5*0.8-6HX	1.5P																								
4202C-M6*0.75-6H	3P	M6	0.75	6	5	80	19	30	4.9	Picture 1	3	●	5.25												
4202C-M6*0.75-6HX	3P																								
4202CS-M6*0.75-6H	1.5P																								
4202CS-M6*0.75-6HX	1.5P																								
4202C-M6*1-6H	3P	M6	1	6	4.7	80	19	30	4.9	Picture 1	3	●	5												
4202CC-M6*1-6H	3P																								
4202C-M6*1-6HX	3P																								
4202CS-M6*1-6H	1.5P																								
4202CCS-M6*1-6H	1.5P	M6	1	6	4.7	80	19	30	4.9	Picture 1	3	●	5												
4202CS-M6*1-6HX	1.5P																								
4202C-M7*1-6H	3P													M7	1	7	5.7	80	19	30	5.5	Picture 1	3	●	6
4202CS-M7*1-6H	1.5P																								
4202C-M8*1-6H	3P	M8	1	8	6.7	90	20	35	6.2	Picture 1	3	●	7												
4202CS-M8*1-6H	1.5P																								
4202C-M8*1.25-6H	3P													M8	1.25	8	6.4	90	22	35	6.2	Picture 1	3	●	6.75
4202CC-M8*1.25-6H	3P																								
4202C-M8*1.25-6HX	3P																								
4202CS-M8*1.25-6H	1.5P																								
4202CCS-M8*1.25-6H	1.5P	M8	1.25	8	6.4	90	22	35	6.2	Picture 1	3	●	6.75												
4202CS-M8*1.25-6HX	1.5P																								

● Stock available ○ Make-to-order

Drilling tools
 Reaming Tools
 Threading Cutter
 Straight-flute cutting tap-cast iron machining



Straight-flute cutting taps - cast iron machining

Type	Basic dimension(mm)												Grade	Pre-hole diameter
	Length of Cutting tap	d ₁	P	d ₂	d ₃	l ₁	l ₂	l ₃	a×a	Thread profile	Geometry	Number of teeth	YK40F	d
4202C-M10*1-6H	3P	M10	1	10	8.7	100	20	39	8	60°	Picture 1	4	●	9
4202CS-M10*1-6H	1.5P													
4202C-M10*1.25-6H	3P	M10	1.25	10	8.4	100	24	39	8		Picture 1	4	●	8.75
4202CS-M10*1.25-6H	1.5P													
4202C-M10*1.5-6H	3P	M10	1.5	10	8.1	100	24	39	8		Picture 1	4	●	8.5
4202CC-M10*1.5-6H	3P													
4202C-M10*1.5-6HX	3P													
4202CS-M10*1.5-6H	1.5P													
4202CCS-M10*1.5-6H	1.5P													
4202CS-M10*1.5-6HX	1.5P													
4202C-M12*1.25-6H	3P	M12	1.25	9		110	29		7		Picture 2	4	●	10.75
4202CS-M12*1.25-6H	1.5P													
4202C-M12*1.5-6H	3P	M12	1.5	9		110	29		7			4	●	10.5
4202CS-M12*1.5-6H	1.5P													
4202C-M12*1.75-6H	3P	M12	1.75	9		110	29		7		Picture 2	4	●	10.25
4202CC-M12*1.75-6H	3P													
4202C-M12*1.75-6HX	3P													
4202CS-M12*1.75-6H	1.5P													
4202CCS-M12*1.75-6H	1.5P													
4202CS-M12*1.75-6HX	1.5P													
4202C-M14*1.5-6H	3P	M14	1.5	11		110	30		9	Picture 2	4	●	12.5	
4202CS-M14*1.5-6H	1.5P													
4202C-M14*2-6H	3P	M14	2	11		110	30		9	Picture 2	4	●	12	
4202CS-M14*2-6H	1.5P													
4202C-M16*1.5-6H	3P	M16	1.5	12		110	32		9	Picture 2	4	●	14.5	
4202CS-M16*1.5-6H	1.5P													
4202C-M16*2-6H	3P	M16	2	12		110	32		9	Picture 2	4	●	14	
4202C-M16*2-6HX	3P													
4202CS-M16*2-6H	1.5P													
4202CS-M16*2-6HX	1.5P													

● Stock available ○ Make-to-order

Drilling tools

Reaming Tools

Threading Cutter

Straight-flute cutting tap-cast iron machining

▶ Applicable material table

○ Very suitable ○ Suitable

Grade	Workpiece material									
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy
YK40F			~40HRC	~50HRC	~60HRC		○	○		

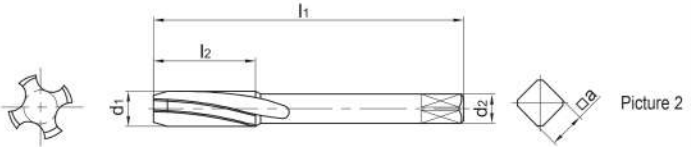
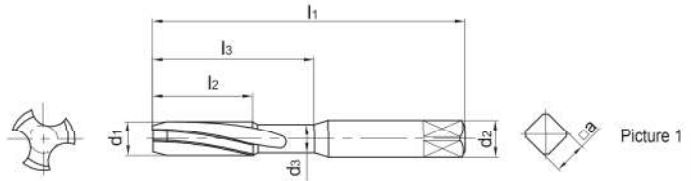




BORING TOOL Threading tools

Helical-flute cutting taps - Al alloys machining

Helical-flute cutting taps - Al alloys machining



Type	Basic dimension(mm)											Grade	Pre-hole diameter	
	Length of Cutting tap	d ₁	P	d ₂	d ₃	l ₁	l ₂	l ₃	a×a	Thread profile	Geometry			Number of teeth
4201A-M3*0.5-6H	3P	M3	0.5	3.5	2.3	56	11	18	2.7	60°	Picture 1	3	●	2.5
4201A-M3*0.5-6HX	3P													
4201AS-M3*0.5-6H	1.5P													
4201AS-M3*0.5-6HX	1.5P													
4201A-M4*0.7-6H	3P	M4	0.7	4.5	3.1	63	13	21	3.4		Picture 1	3	●	3.3
4201A-M4*0.7-6HX	3P													
4201AS-M4*0.7-6H	1.5P													
4201AS-M4*0.7-6HX	1.5P													
4201A-M5*0.8-6H	3P	M5	0.8	6	4	70	16	25	4.9		Picture 1	3	●	4.2
4201A-M5*0.8-6HX	3P													
4201AS-M5*0.8-6H	1.5P													
4201AS-M5*0.8-6HX	1.5P													
4201A-M6*0.75-6H	3P	M6	0.75	6	5	80	19	30	4.9	Picture 1	3	●	5.25	
4201A-M6*0.75-6HX	3P													
4201AS-M6*0.75-6H	1.5P													
4201AS-M6*0.75-6HX	1.5P													
4201A-M6*1-6H	3P	M6	1	6	4.7	80	19	30	4.9	Picture 1	3	●	5	
4201AC-M6*1-6H	3P													
4201A-M6*1-6HX	3P													
4201AS-M6*1-6H	1.5P													
4201AS-M6*1-6HX	1.5P	M7	1	7	5.7	80	19	30	5.5	Picture 1	3	●	6	
4201A-M7*1-6H	3P													
4201AS-M7*1-6H	1.5P													
4201AS-M7*1-6HX	1.5P													
4201A-M8*1-6H	3P	M8	1	8	6.7	90	20	35	6.2	Picture 1	3	●	7	
4201AS-M8*1-6H	1.5P													

● Stock available ○ Make-to-order

Drilling tools

Reaming Tools

Threading Cutter

Helical-flute cutting taps --Al alloys machining



Helical-flute cutting taps - Al alloys machining

Type	Basic dimension(mm)												Grade	Pre-hole diameter											
	Length of Cutting tap	d ₁	P	d ₂	d ₃	l ₁	l ₂	l ₃	a×a	Thread profile	Geometry	Number of teeth	YK40F	d											
4201A-M8*1.25-6H	3P	M8	1.25	8	6.4	90	22	35	6.2	60°	Picture 1	3	●	6.75											
4201AC-M8*1.25-6H	3P																								
4201A-M8*1.25-6HX	3P																								
4201AS-M8*1.25-6H	1.5P																								
4201ACS-M8*1.25-6H	1.5P																								
4201AS-M8*1.25-6HX	1.5P																								
4201A-M10*1-6H	3P	M10	1	10	8.7	100	20	39	8		Picture 1	4	●	9											
4201AS-M10*1-6H	1.5P																								
4201A-M10*1.25-6H	3P																								
4201AS-M10*1.25-6H	1.5P	M10	1.25	10	8.4	100	24	39	8		Picture 1	4	●	8.75											
4201A-M10*1.5-6H	3P																								
4201AC-M10*1.5-6H	3P																								
4201A-M10*1.5-6HX	3P																								
4201AS-M10*1.5-6H	1.5P																								
4201ACS-M10*1.5-6H	1.5P																								
4201AS-M10*1.5-6HX	1.5P	M10	1.5	10	8.1	100	24	39	8		Picture 1	4	●	8.5											
4201A-M12*1.25-6H	3P																								
4201AS-M12*1.25-6H	1.5P																								
4201A-M12*1.5-6H	3P																								
4201AS-M12*1.5-6H	1.5P																								
4201A-M12*1.75-6H	3P																								
4201AC-M12*1.75-6H	3P	M12	1.25	9		110	29		7		Picture 2	4	●	10.75											
4201AS-M12*1.25-6H	1.5P																								
4201A-M12*1.5-6H	3P																								
4201AS-M12*1.5-6H	1.5P																								
4201A-M12*1.75-6H	3P																								
4201AC-M12*1.75-6H	3P																								
4201A-M12*1.75-6HX	3P	M12	1.75	9		110	29		7	Picture 2	4	●	10.25												
4201AS-M12*1.75-6H	1.5P																								
4201ACS-M12*1.75-6H	1.5P																								
4201AS-M12*1.75-6HX	1.5P																								
4201A-M14*1.5-6H	3P													M14	1.5	11		110	30		9	Picture 2	4	●	12.5
4201AS-M14*1.5-6H	1.5P																								
4201A-M14*2-6H	3P	M14	2	11		110	30		9	Picture 2	4	●	12												
4201AS-M14*2-6H	1.5P																								
4201A-M16*1.5-6H	3P	M16	1.5	12		110	32		9	Picture 2	4	●	14.5												
4201AS-M16*1.5-6H	1.5P																								
4201A-M16*2-6H	3P	M16	2	12		110	32		9	Picture 2	4	●	14												
4201A-M16*2-6HX	3P																								
4201AS-M16*2-6H	1.5P																								
4201AS-M16*2-6HX	1.5P																								

● Stock available ○ Make-to-order

▶ Applicable material table

○ Very suitable ○ Suitable

Grade	Workpiece material									
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy
YK40F			~40HRC	~50HRC	~60HRC				○	



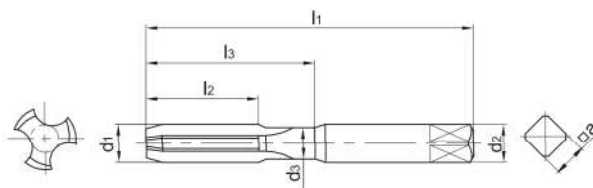
Drilling tools
 Reaming Tools
 Threading Cutter
 Helical-flute cutting taps --Al alloys machining



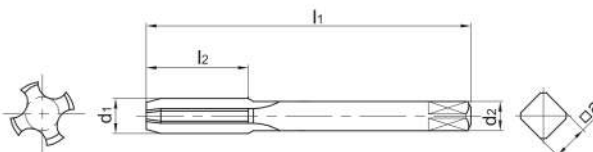
BORING TOOL Threading tools

Straight-flute cutting taps - Al alloys machining

Straight-flute cutting taps - Al alloys machining



Picture 1



Picture 2



Type	Basic dimension(mm)												Grade	Pre-hole diameter
	Length of Cutting tap	d ₁	P	d ₂	d ₃	l ₁	l ₂	l ₃	a×a	Thread profile	Geometry	Number of teeth		
4202A-M3*0.5-6H	3P	M3	0.5	3.5	2.3	56	11	18	2.7	60°	Picture 1	3	●	2.5
4202A-M3*0.5-6HX	3P													
4202AS-M3*0.5-6H	1.5P													
4202AS-M3*0.5-6HX	1.5P													
4202A-M4*0.7-6H	3P	M4	0.7	4.5	3.1	63	13	21	3.4		Picture 1	3	●	3.3
4202A-M4*0.7-6HX	3P													
4202AS-M4*0.7-6H	1.5P													
4202AS-M4*0.7-6HX	1.5P													
4202A-M5*0.8-6H	3P	M5	0.8	6	4	70	16	25	4.9		Picture 1	3	●	4.2
4202A-M5*0.8-6HX	3P													
4202AS-M5*0.8-6H	1.5P													
4202AS-M5*0.8-6HX	1.5P													
4202A-M6*0.75-6H	3P	M6	0.75	6	5	80	19	30	4.9	Picture 1	3	●	5.25	
4202A-M6*0.75-6HX	3P													
4202AS-M6*0.75-6H	1.5P													
4202AS-M6*0.75-6HX	1.5P													
4202A-M6*1-6H	3P	M6	1	6	4.7	80	19	30	4.9	Picture 1	3	●	5	
4202AC-M6*1-6H	3P													
4202A-M6*1-6HX	3P													
4202AS-M6*1-6H	1.5P													
4202ACS-M6*1-6H	1.5P	M6	1	6	4.7	80	19	30	5.5	Picture 1	3	●	6	
4202AS-M6*1-6HX	1.5P													
4202A-M7*1-6H	3P													
4202AS-M7*1-6H	1.5P													
4202A-M8*1-6H	3P	M8	1	8	6.7	90	20	35	6.2	Picture 1	3	●	7	
4202AS-M8*1-6H	1.5P													

● Stock available ○ Make-to-order

Drilling tools

Reaming Tools

Threading Cutter

Helical-flute cutting taps --Al alloys machining



Straight-flute cutting taps - Al alloys machining

Type	Basic dimension(mm)												Grade	Pre-hole diameter
	Length of Cutting tap	d ₁	P	d ₂	d ₃	l ₁	l ₂	l ₃	a×a	Thread profile	Geometry	Number of teeth	YK40F	d
4202A-M8*1.25-6H	3P	M8	1.25	8	6.4	90	22	35	6.2	60°	Picture 1	3	●	6.75
4202AC-M8*1.25-6H	3P													
4202A-M8*1.25-6HX	3P													
4202AS-M8*1.25-6H	1.5P													
4202ACS-M8*1.25-6H	1.5P													
4202AS-M8*1.25-6HX	1.5P													
4202A-M10*1-6H	3P	M10	1	10	8.7	100	20	39	8		Picture 1	4	●	9
4202AS-M10*1-6H	1.5P													
4202A-M10*1.25-6H	3P	M10	1.25	10	8.4	100	24	39	8		Picture 1	4	●	8.75
4202AS-M10*1.25-6H	1.5P													
4202A-M10*1.5-6H	3P	M10	1.5	10	8.1	100	24	39	8		Picture 1	4	●	8.5
4202AC-M10*1.5-6H	3P													
4202A-M10*1.5-6HX	3P													
4202AS-M10*1.5-6H	1.5P													
4202ACS-M10*1.5-6H	1.5P													
4202AS-M10*1.5-6HX	1.5P													
4202A-M12*1.25-6H	3P	M12	1.25	9		110	29		7		Picture 2	4	●	10.75
4202AS-M12*1.25-6H	1.5P													
4202A-M12*1.5-6H	3P	M12	1.5	9		110	29		7		Picture 2	4	●	10.5
4202AS-M12*1.5-6H	1.5P													
4202A-M12*1.75-6H	3P	M12	1.75	9		110	29		7		Picture 2	4	●	10.25
4202AC-M12*1.75-6H	3P													
4202A-M12*1.75-6HX	3P													
4202AS-M12*1.75-6H	1.5P													
4202ACS-M12*1.75-6H	1.5P													
4202AS-M12*1.75-6HX	1.5P													
4202A-M14*1.5-6H	3P	M14	1.5	11		110	30		9	Picture 2	4	●	12.5	
4202AS-M14*1.5-6H	1.5P													
4202A-M14*2-6H	3P	M14	2	11		110	30		9	Picture 2	4	●	12	
4202AS-M14*2-6H	1.5P													
4202A-M16*1.5-6H	3P	M16	1.5	12		110	32		9	Picture 2	4	●	14.5	
4202AS-M16*1.5-6H	1.5P													
4202A-M16*2-6H	3P	M16	2	12		110	32		9	Picture 2	4	●	14	
4202A-M16*2-6HX	3P													
4202AS-M16*2-6H	1.5P													
4202AS-M16*2-6HX	1.5P													

● Stock available ○ Make-to-order

▶ Applicable material table

● Very suitable ○ Suitable

Grade	Workpiece material									
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy
YK40F			~40HRC	~50HRC	~60HRC				○	



Helical-flute cutting taps --Al alloys machining

Threading
Cutter

Reaming
Tools

Drilling
tools

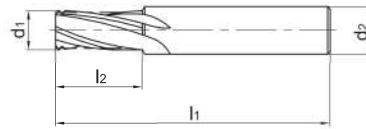


Newly upgraded!

Solid carbide
Thread mills



Thread mills



Type	Basic dimension(mm)							Recommended grade		Pre-hole diameter
	D	d ₁	P	d ₂	l ₁	l ₂	Number of teeth	KTG4015	YK40F	d
4111-M3*0.5	M3	2.35	0.5	4	50	6	3	●	○	2.5
4111-M4*0.7	M4	3.15	0.7	4	50	8	3	●	○	3.3
4111-M5*0.5	M5	4.3	0.5	6	50	10	3	●	○	4.5
4111-M5*0.8	M5	4	0.8	6	50	10	3	●	○	4.2
4111-M6*0.75	M6	5	0.75	6	60	12	4	●	○	5.25
4111-M6*1	M6	4.75	1	6	60	12	4	●	○	5
4111-M8*1	M8	6.65	1	8	60	16	4	●	○	7
4111-M8*1.25	M8	6.45	1.25	8	60	16	4	●	○	6.75
4111-M10*1	M10	8.55	1	10	75	20	4	●	○	9
4111-M10*1.5	M10	8.1	1.5	10	75	20	4	●	○	8.5
4111-M12*1.25	M12	10.25	1.25	12	75	24	4	●	○	10.75
4111-M12*1.75	M12	9.75	1.75	12	75	24	4	●	○	10.25
4111-M14*1	M14	12.35	1	14	75	20	4	●	○	13
4111-M14*1.5	M14	11.9	1.5	14	75	28	4	●	○	12.5
4111-M14*2	M14	11.4	2	14	75	28	4	●	○	12
4111-M16*2	M16	13.3	2	16	90	32	6	●	○	14
4111-M18*1	M18	16.15	1	18	90	20	6	●	○	17
4111-M18*2.5	M18	14.75	2.5	18	90	36	6	●	○	15.5
4111-M20*2	M20	17.1	2	18	100	40	6	●	○	18
4111-M20*2.5	M20	16.65	2.5	18	100	40	6	●	○	17.5

● Stock available ○ Make-to-order

Drilling tools

Reaming Tools

Threading Cutter

Thread milling cutter

▶▶ Applicable material table

● Very suitable ○ Suitable

Grade	Workpiece material									
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy
			~40HRC	~50HRC	~60HRC					
KTG4015	○	●	○				○	○		
YK40F							○	○	○	○





Forming tap

Workpiece material	Cutting speed (m/min)
Stainless steel / Mild steel	5~20
Aluminium alloy	20~50
Cast aluminium alloy(Si<10%)	15~40

Cutting tap

Workpiece material	Cutting speed (m/min)
Grey cast iron	15~30
Nodular cast iron	10~20
Aluminium alloy	20~50
Cast aluminium alloy (Si < 10%)	20~45
Cast aluminium alloy (Si ≥ 10%)	15~40

Thread mills

Workpiece material	Cutting speed (m/min)		Feed rate (mm/z)	
	Uncoated	Coated	D≤8	D>8
Alloy steel、Common steel	20~60	40~120	0.02~0.05	0.04~0.12
Aluminium alloy	100~250	---	0.05~0.2	

Note:

The tool entering feed is less than 70% of threading feed. It is in direct proportion to the diameter of the tap. The above cut parameters are suitable for thread cutters with helical flute. Please reduce feed rate and cutting speed by 20% ~ 40% if it is straight-flute tools.

Drilling tools

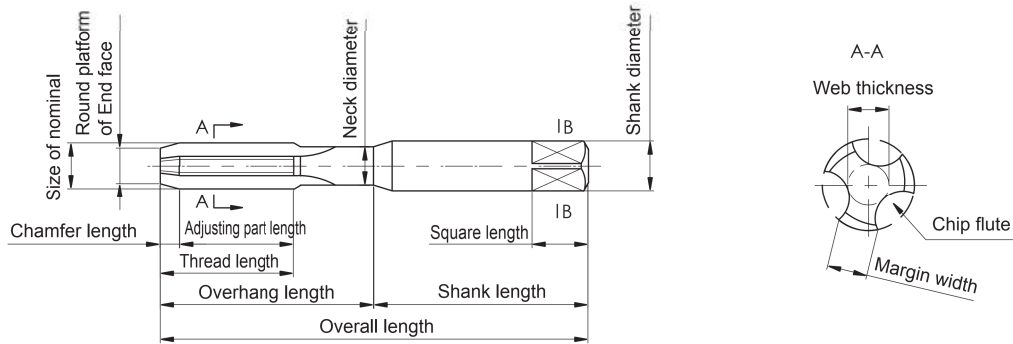
Reaming Tools

Threading Cutter

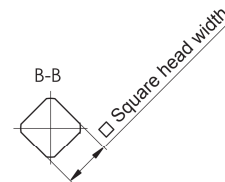
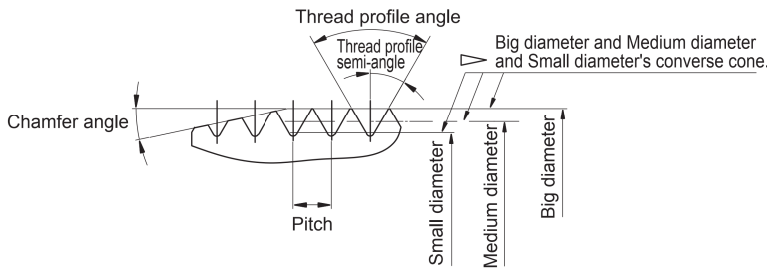
Recommended cutting parameters

Tap

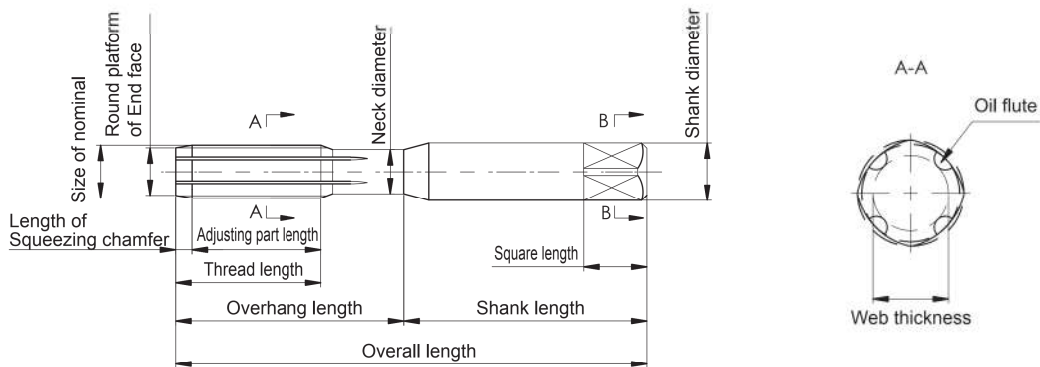
Parts terminology of cutting taps



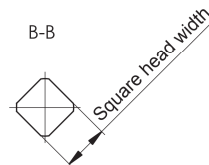
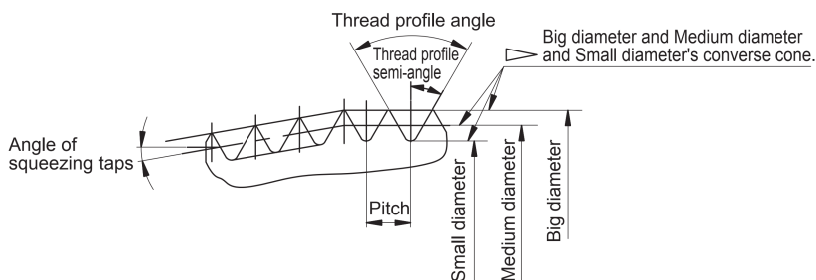
Magnifying fig of chamfer and thread profile



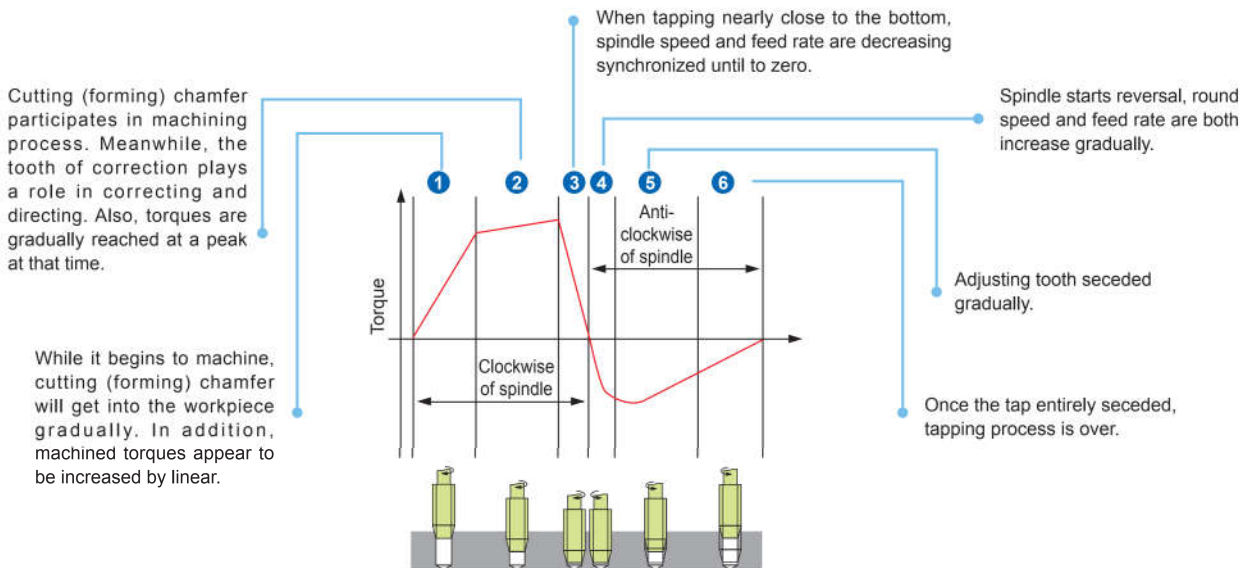
Parts terminology of forming taps



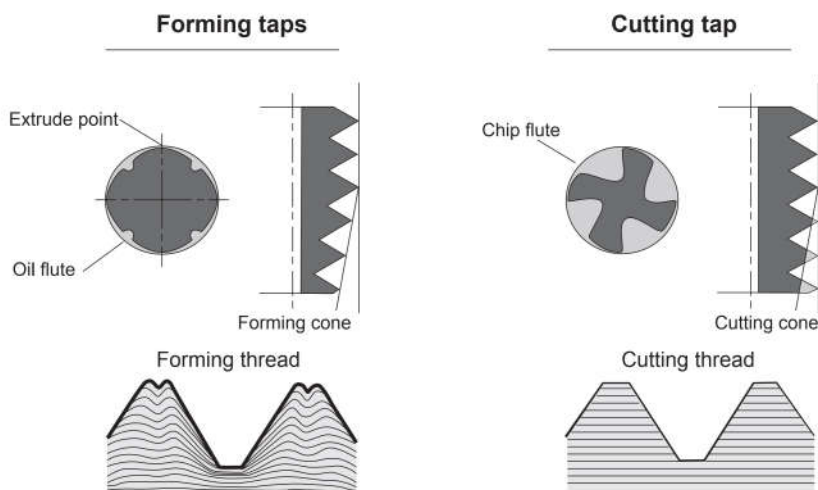
Magnifying fig of squeezing chamfer and guided threads



Process of tapping and tapping torques



Comparison of forming taps and cutting taps



Tapping types of cutting taps

Due to different machines, tapping types of cutting taps can be broadly divided into flexible tapping and rigid tapping. Due to different pre-hole, it can also be divided into through-hole tapping and blind-hole tapping.

Rigid tapping: Machine tool has good precision, the spindle feed rate is consistent with the tap pitch. Used general chucks.




Flexible tapping: Machine tool has poor precision, the spindle feed rate cannot be strictly in accordance with the pitch. Compensating floating chucks should be used to compensate the error between the tapping feed and the tap pitch, so that the tap can feed in accordance with the pitch.

Through-hole tapping: chip removal along the direction of tapping feed, so that the chip clogging and scratching and squeezing on the machined surface caused by chips can be reduced and the accuracy of thread processing can be improved.

Bind-hole tapping: chips removal along the direction of tap shank. Increase of cutting force, which is caused by chips blocked in the groove, can be prevented.



Features and applications of tap flute

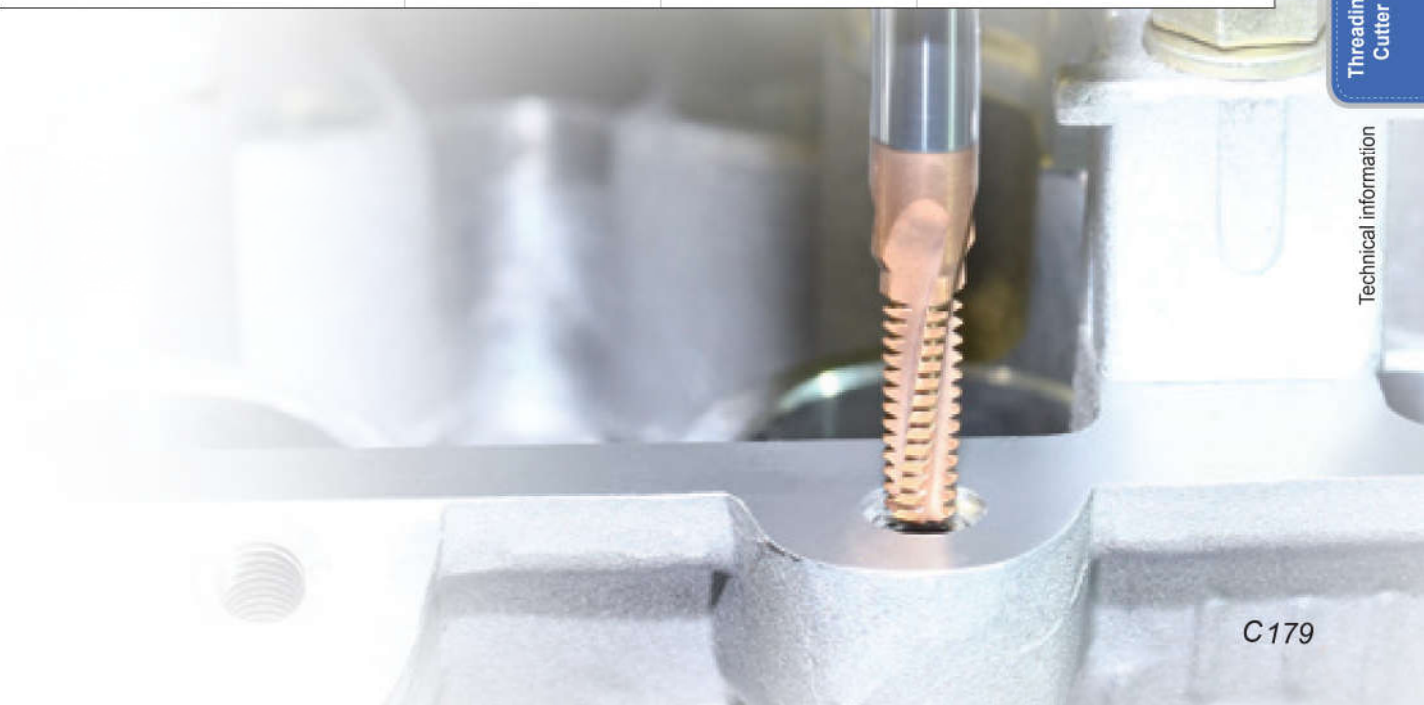
Classification	Advantages	Disadvantages	Recommend applications
<p>Straight-flute taps</p> 	<ul style="list-style-type: none"> ● general performance is good ● high cutting edge strength ● easy to regrind 	<ul style="list-style-type: none"> ● large cutting torque by machining ● bad chip-breaking and chip removal ability ● cannot tapping to the bottom of blind holes 	<ul style="list-style-type: none"> ● for machining of high hardness material ● material generating powdered chips ● material easy to cause abrasion ● tap shot through and blind hole
<p>Helical-flute taps</p> 	<ul style="list-style-type: none"> ● small cutting torque by machining ● better chip-breaking and chip removal ability ● available for tapping to the bottom of blind holes ● penetrate to pre-hole easily 	<ul style="list-style-type: none"> ● bad cutting edge strength ● easily fall in tooth when seceding 	<ul style="list-style-type: none"> ● tap long through and blind hole ● material generating long curling chips ● the hole with axial slot on inner wall
<p>Forming taps</p> 	<ul style="list-style-type: none"> ● no chips ● high precision of internal thread ● high tool strength ● available for tapping to the bottom of blind holes 	<ul style="list-style-type: none"> ● only for machining of specific material ● high requirement of pre-hole ● high requirement of lubrication liquid 	<ul style="list-style-type: none"> ● for soft materials with good toughness and ductility ● tap through and blind hole

Drilling tools

Reaming Tools

Threading Cutter

Technical information



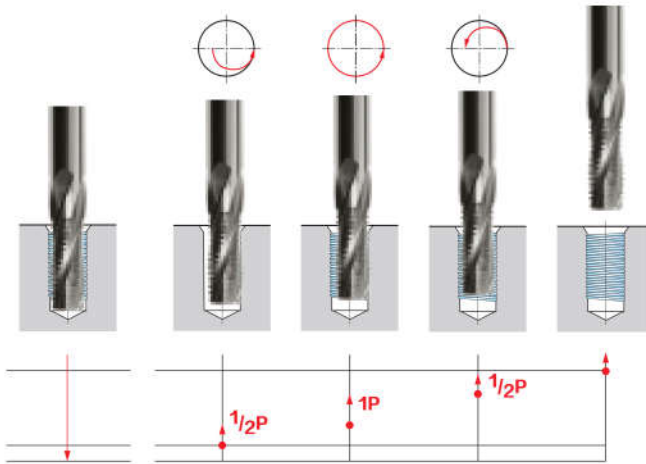


The common problems in tapping

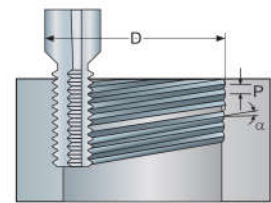
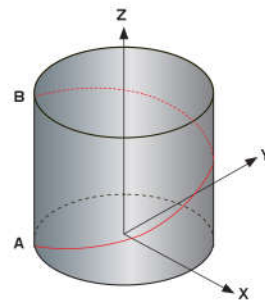
Common problems	Reasons	Solutions
Too large Internal thread	Wrong tap type selection	Selecting right tap according to work materials and requirement
	Pre-hole is too large	Select appropriate prehole drills
	Pre-hole is off center	Improve prehole quality
		Change to floated tapping method
	Axial feed not equable	Mechanical feed
		Use flexible tapping
	Build-up edge	Regrinding in time or change taps
		Adopt coated taps
		Fully lubricated
Extremely high cutting speed	Lower cutting speed	
Insufficient lubrication or cooling	Check lubricating oil density	
	Increase cooling liquid pressure and volume	
Wrong selection of tap tolerance level	Select taps with right tolerance	
Too small internal thread	Wrong selection of tap tolerance level	Select taps with right tolerance
	Wrong tapping	Avoid taps bear higher axial stress in the process of tapping
	The rigidity of machine tool spindle is too well	Adopt axial floated chuck
Thread disorderly buckle	When starts tapping, force too much press on right helical taps	Decrease pressure when starts tapping
	When starts tapping, force too small press on left helical taps	increase pressure when starts tapping
	Unmatched of machine tool feed and thread pitch	Change to floated tapping
Unsmooth on internal thread surface	Wrong selection of taps	Selecting right tap according to work materials and requirement
	Too high Cutting speed	Lower cutting speed
	Insufficient cooling	Use right cooling liquid and enough volume or select taps with inner coolant
	Obstructed chip removal	Select helical flute taps
	Too small pre-hole diameter	Adjust pre-hole drill
	Build-up edge	Adopt coated taps
Fully lubricated		
Tap breakage	Too small pre-hole	Adjust pre-hole drill
	Torque is too large when tapping	Increase length of cutting chamfer
		Increase cutting edge
	Tap touch hole bottom	Check the depth of pre-hole
		Adopt floated tapping
	Pre-hole chamfer is too small, pre-hole location or angle error	Check pre-hole
		adopt floated tapping
Cutting speed is too high	Lower cutting speed	
	Select helical flute taps	

Thread mills

Thread mills (graphic demonstration)



Thread milling is composed of tool rotation and helical interpolate mill of machine tool. In a circle interpolation process, required threads are machined by using the geometry shape of tool and moving axially with a pitch.



α: helical angle
D: large-diameter
p: pitch

Picture A

Picture B

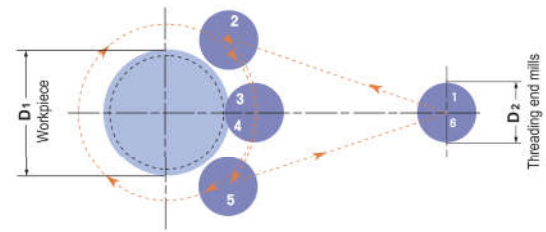
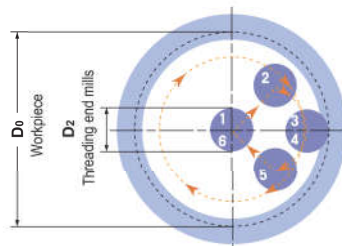
Arc entering method

Thread milling can use arc entering method and radial entering method.

Arc entering: placidly entering and out leads to almost no cutting traces or vibration, so that it is particularly suitable for materials difficult to be machined and precise threading.

Internal thread

External thread



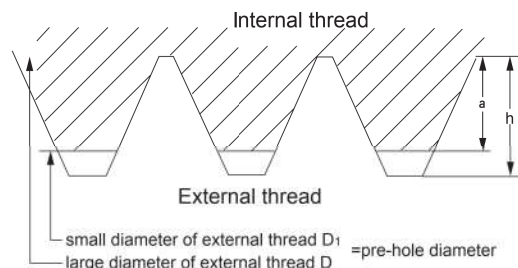
1-2 rapid positioning
2-3 entering by arc feed and interpolating along the Z axis at the same time
3-4 360° full circle cutting interpolation and axial moving of one pitch

4-5 cutting-out by arc feed and interpolating along the Z axis at the same time
5-6 quick return

Thread overlap ratio

The thread overlap ratio is the ratio of effective chimeric height of external thread and internal thread and the height of standard tooth. It must be considered before machining of internal thread pre-hole.

while external thread appears to be standardized tooth



$$\text{Thread overlap ratio} = \frac{\text{Reference dimension of large diameter of external thread} - \text{pre-hole diameter}}{2 \times (\text{height of standard tooth type})} \times 100\%$$

a = 1/2 × (D - D₁)
h = height of standard tooth of external thread
chimerism ratio = a/h × 100%

Drilling tools

Reaming Tools

Threading Cutter

Technical information



The solutions of common problems in thread milling

	Common problems	reasons	solutions	
Thread milling cutter	Roughness on internal thread milling cutter surface	Too long overhang	Decrease the length of overhang	
		Select wrong type	Select appropriate tool(e.g. tool with helix flute)	
		Poor chip removal	Select helix flute tap Adopt inner cooling	
		Too large cutting force	Decrease cutting force	
		Unreasonable cutting parameter	Adjust cutting parameter	
	Severe tool wear	Unreasonable cutting parameter		Lower cutting speed Increase the feed rate per tooth
			Unreasonable machining mode	Adopt down milling Adopt Arc cut-in milling.
		Uncoated tools/inappropriate coated	Adopt Coated tool/ instead coat	
		Too large overhang	Decrease length of overhang	
	Falling on cutting edge	Unreasonable cutting parameter	Decrease the feed rate per tooth	
		Unreasonable machining mode		Adopt down milling Adopt Arc cut-in milling
			Uncoated tools/inappropriate coated	Adopt Coated tool/instead coat
		Too large overhang	Decrease length of overhang	
	Thread is taper	Unreasonable cutting parameter	Decrease the feed rate per tooth	
		Unreasonable machining mode	Adopt up milling	
		Too large overhang	Decrease length of overhang	
Too large cutting force		Decrease cutting force		

Drilling tools

Reaming Tools

Threading Cutter

Technical information