

How to choose the right solid carbide reamers

Shape

Product type

Product name

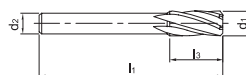
Product category

Shape size

Reamers

Solid carbide reamer with straight shank and right helical flute

3101H7



H7

Type	Basic dimension(mm)				Number of tooth	Recommended grade
	d1	d2(h7)	l1	l3		
3101H7-0400	4.0	3.55	56	20	4	☆
3101H7-0450	4.5	4.00	63	22	6	☆
3101H7-0500	5.0	4.00	63	22	6	☆
3101H7-0550	5.5	5.00	63	22	6	☆
3101H7-0600	6.0	5.00	63	22	6	☆
3101H7-0650	6.5	5.00	63	22	6	☆
3101H7-0700	7.0	6.30	71	25	6	☆
3101H7-0750	7.5	6.30	71	25	6	☆
3101H7-0800	8.0	6.30	71	25	6	☆
3101H7-0850	8.5	8.00	71	25	6	☆
3101H7-0900	9.0	8.00	71	25	6	☆
3101H7-0950	9.5	8.00	71	25	6	☆
3101H7-1000	10.0	8.00	71	25	6	☆
3101H7-1050	10.5	8.00	71	25	6	☆
3101H7-1100	11.0	10.00	80	28	6	☆
3101H7-1150	11.5	10.00	80	28	6	☆
3101H7-1200	12.0	10.00	80	28	6	☆
3101H7-1250	12.5	10.00	80	28	6	☆
3101H7-1300	13.0	10.00	80	28	6	☆
3101H7-1350	13.5	12.5	90	32	6	☆
3101H7-1400	14.0	12.5	90	32	6	☆
3101H7-1450	14.5	12.5	90	32	6	☆
3101H7-1500	15.0	12.5	90	32	6	☆
3101H7-1550	15.5	12.5	90	32	6	☆
3101H7-1600	16.0	12.5	90	32	6	☆
3101H7-1700	17.0	12.5	90	32	6	☆
3101H7-1800	18.0	16.00	100	36	6	☆
3101H7-1900	19.0	16.00	100	36	6	☆
3101H7-2000	20.0	16.00	100	36	6	☆

☆Recommended grade (produce according to order)

Applicable material table

Very suitable ○ Suitable ○

Grade	Workpiece material										
	Mild steel HBs180	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						
YK10F							○	○	○	○	

Code key

Cutting parameters

Technical information

C106

C110

C111~C113

Applicable workpiece material range

Hole precision class and shank type

Specification

Type, basic dimensions, number of tooth and grade.

Code key, cutting parameter, technical information.

BORING TOOLS

Reamers

C106	Solid carbide reamers overview
C106	Icons information
C106	Solid carbide reamer code key
C107-C109	Detail information of solid carbide reamers
C110	Recommended cutting parameters for solid carbide reamers
C111-113	Technical information for solid carbide reamers



BORING TOOL

Reaming Tools

Solid carbide reamers overview

Solid carbide reamers 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	Copper alloy		
Right helical flute reamer	3101H7		Ø4-Ø20				○	○	○	C107	C110
Straight flute reamer	3102H7		Ø4-Ø20				○	○	○	C108	C110
Left helical flute reamer	3103H7		Ø4-Ø20				○	○	○	C109	C110

○ Very suitable ○ Suitable

Solid carbide reamers icons information

Precision class of reamed hole

H7

The precision class of reamed hole reaches H7 specified in GB/T1800-1804

Shank type



Straight shank

Solid carbide reamer code key

Code	Description
3	Reamer

Tool type

Code	Description
1	Right chip flute
2	Straight flute
3	Left chip flute

Type of flute

Code	Description
H7	The precision class of reamed hole reaches H7 specified in GB/T1800-1804

Precision class of reamed hole

3 1 0 1 H7 -0850

Shank type	
Code	Description
1	Straight shank
2	Square straight shank as per DIN10
5	Straight shank as per DIN6535HA
9	Tapered shank

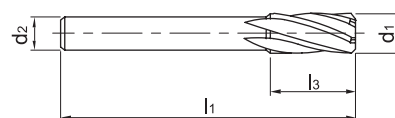
Mode of cooling	
Code	Description
0	External coolant
1	Internal coolant

Specification	
Code	Description
0850	Diameter is 8.5mm

Solid carbide reamer with straight shank and right helical flute

Solid carbide reamer with straight shank and right helical flute

3101H7



H7



Type	Basic dimension(mm)				Number of tooth	Recommended grade YK10F
	d1	d2(h7)	l1	l3		
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YK10F							⊙	⊙	⊙	⊙	

Code key

C106

Cutting parameters

C110

Technical information

C111-C113



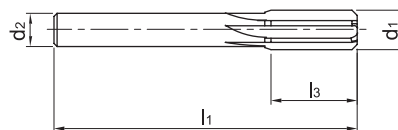
BORING TOOL

Reaming Tools

Solid carbide reamer with straight shank and right helical flute

Solid carbide reamer with straight shank and straight flute

3102H7



H7



Type	Basic dimension(mm)				Number of tooth	Recommended grade
	d1	d2(h7)	l1	l3		YK10F
3102H7-0400	4.0	3.55	56	20	4	☆
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3102H7-0650	6.5	5.00	63	22	6	☆
3102H7-0700	7.0	6.30	71	25	6	☆
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3102H7-1050	10.5	8.00	71	25	6	☆
3102H7-1100	11.0	10.00	80	28	6	☆
3102H7-1150	11.5	10.00	80	28	6	☆
3102H7-1200	12.0	10.00	80	28	6	☆
3102H7-1250	12.5	10.00	80	28	6	☆
3102H7-1300	13.0	10.00	80	28	6	☆
3102H7-1350	13.5	12.5	90	32	6	☆
3102H7-1400	14.0	12.5	90	32	6	☆
3102H7-1450	14.5	12.5	90	32	6	☆
3102H7-1500	15.0	12.5	90	32	6	☆
3102H7-1550	15.5	12.5	90	32	6	☆
3102H7-1600	16.0	12.5	90	32	6	☆
3102H7-1700	17.0	12.5	90	32	6	☆
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			~40HRC	~50HRC	~60HRC						
YK10F							⊙	⊙	⊙	⊙	

Code key

C106

Cutting parameters

C110

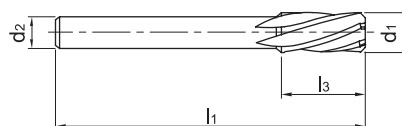
Technical information

C111-C113

Solid carbide reamer with straight shank and right helical flute

Solid carbide reamer with straight shank and left helical flute

3103H7



Type	Basic dimension(mm)				Number of tooth	Recommended grade
	d ₁	d ₂ (h ₇)	l ₁	l ₃		YK10F
3103H7-0400	4.0	3.55	56	20	4	☆
3103H7-0450	4.5	4.00	63	22	6	☆
3103H7-0500	5.0	4.00	63	22	6	☆
3103H7-0550	5.5	5.00	63	22	6	☆
3103H7-0600	6.0	5.00	63	22	6	☆
3103H7-0650	6.5	5.00	63	22	6	☆
3103H7-0700	7.0	6.30	71	25	6	☆
3103H7-0750	7.5	6.30	71	25	6	☆
3103H7-0800	8.0	6.30	71	25	6	☆
3103H7-0850	8.5	8.00	71	25	6	☆
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3103H7-0950	9.5	8.00	71	25	6	☆
3103H7-1000	10.0	8.00	71	25	6	☆
3103H7-1050	10.5	8.00	71	25	6	☆
3103H7-1100	11.0	10.00	80	28	6	☆
3103H7-1150	11.5	10.00	80	28	6	☆
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3103H7-1250	12.5	10.00	80	28	6	☆
3103H7-1300	13.0	10.00	80	28	6	☆
3103H7-1350	13.5	12.5	90	32	6	☆
3103H7-1400	14.0	12.5	90	32	6	☆
3103H7-1450	14.5	12.5	90	32	6	☆
3103H7-1500	15.0	12.5	90	32	6	☆
3103H7-1550	15.5	12.5	90	32	6	☆
3103H7-1600	16.0	12.5	90	32	6	☆
3103H7-1700	17.0	12.5	90	32	6	☆
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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
YK10F			~40HRC	~50HRC	~60HRC		⊙	⊙	⊙	⊙

Code key

C106

Cutting parameters

C110

Technical information

C111-C113

Drilling tools

Reaming Tools

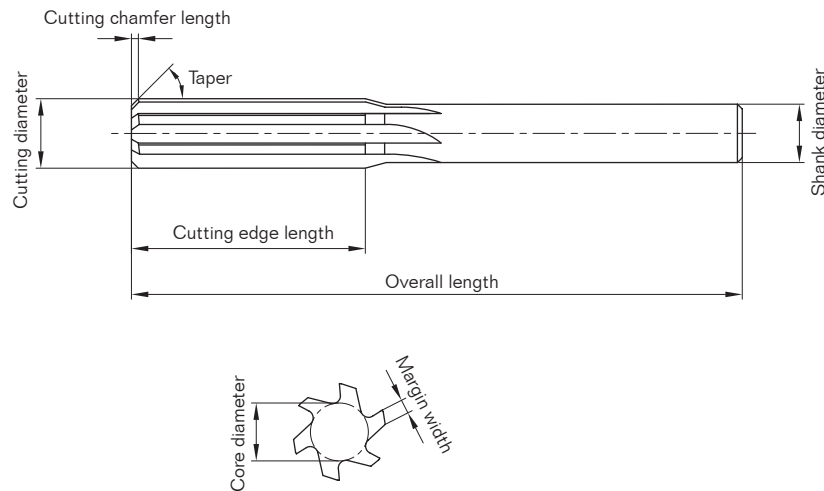
Solid carbide reamer with straight shank and right helical flute

3101H7★3102H7★3103H7

Workpiece material	Cast iron Nodular cast iron			Copper alloy			Casting aluminium alloy		
Cutting speed	8~16m/min			10~25m/min			15~30 m/min		
Diameter (mm)	Rotating speed (min ⁻¹)	Feed rate (mm/r)	Allowance (mm)	Rotating speed (min ⁻¹)	Feed rate (mm/r)	Allowance (mm)	Rotating speed (min ⁻¹)	Feed rate (mm/r)	Allowance (mm)
4	950	0.04~0.06	0.1~0.2	1600	0.04~0.06	0.1~0.2	2000	0.04~0.06	0.1~0.2
5	760	0.05~0.09	0.1~0.2	1300	0.05~0.09	0.1~0.2	1600	0.05~0.09	0.1~0.2
6	640	0.06~0.12	0.1~0.2	1050	0.06~0.12	0.1~0.2	1300	0.06~0.12	0.1~0.2
7	550	0.07~0.14	0.1~0.2	910	0.07~0.14	0.1~0.2	1150	0.07~0.14	0.1~0.2
8	480	0.08~0.16	0.1~0.2	800	0.08~0.16	0.1~0.2	1000	0.08~0.16	0.1~0.2
9	430	0.09~0.18	0.1~0.2	710	0.09~0.18	0.1~0.2	890	0.09~0.18	0.1~0.2
10	380	0.10~0.20	0.1~0.2	640	0.10~0.20	0.1~0.2	800	0.10~0.20	0.1~0.2
11	350	0.11~0.22	0.1~0.2	580	0.11~0.22	0.1~0.2	720	0.11~0.22	0.1~0.2
12	320	0.12~0.24	0.1~0.2	530	0.12~0.24	0.1~0.2	660	0.12~0.24	0.1~0.2
13	290	0.13~0.26	0.1~0.2	490	0.13~0.26	0.1~0.2	610	0.13~0.26	0.1~0.2
14	270	0.14~0.28	0.1~0.2	460	0.14~0.28	0.1~0.2	570	0.14~0.28	0.1~0.2
15	250	0.15~0.30	0.1~0.2	430	0.15~0.30	0.1~0.2	530	0.15~0.30	0.1~0.2
16	240	0.16~0.32	0.1~0.2	400	0.16~0.32	0.1~0.2	500	0.16~0.32	0.1~0.2
17	225	0.18~0.34	0.1~0.2	380	0.18~0.34	0.1~0.2	470	0.18~0.34	0.1~0.2
18	210	0.20~0.36	0.1~0.2	350	0.20~0.36	0.1~0.2	440	0.20~0.36	0.1~0.2
19	200	0.22~0.38	0.1~0.2	340	0.22~0.38	0.1~0.2	420	0.22~0.38	0.1~0.2
20	190	0.24~0.40	0.1~0.2	320	0.24~0.40	0.1~0.2	400	0.24~0.40	0.1~0.2

1. Please select the holder with high rigidity and high precision.
2. Make sure coolant supply is sufficient.
3. Please adjust cutting parameters according to workpiece and machine rigidity.

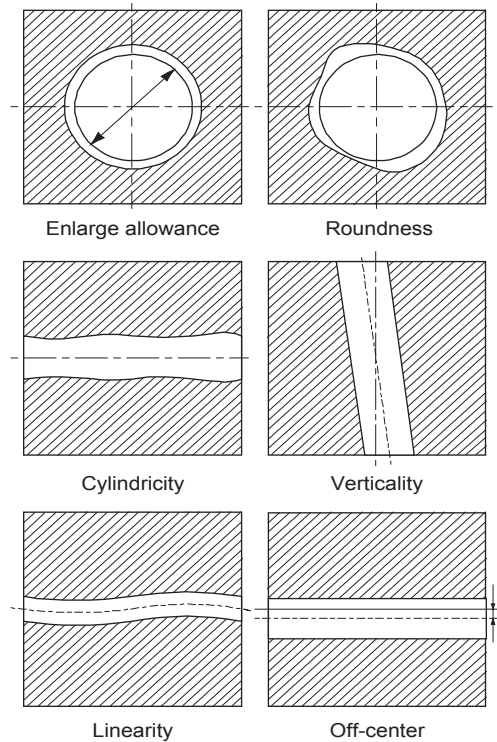
Terminology of reamer



Reaming is the semi-finishing and finishing of an existing hole to achieve precise size, high surface quality, perfect roundness and cylindricity, etc.

In order to gain precise hole in reaming process, the reamer diameter must be defined correctly. Therefore, it is necessary to consider the allowance which is determined by workpiece material and machining conditions. It is also necessary to select the cutting conditions correctly in addition to using high precision reamer to achieve good surface quality.

The reaming precision is mainly determined by diameter and radial run-out. With respect to cutting condition, it is better to select low speed cutting to improve machining precision, but the upper limit should be considered carefully for higher machining efficiency.

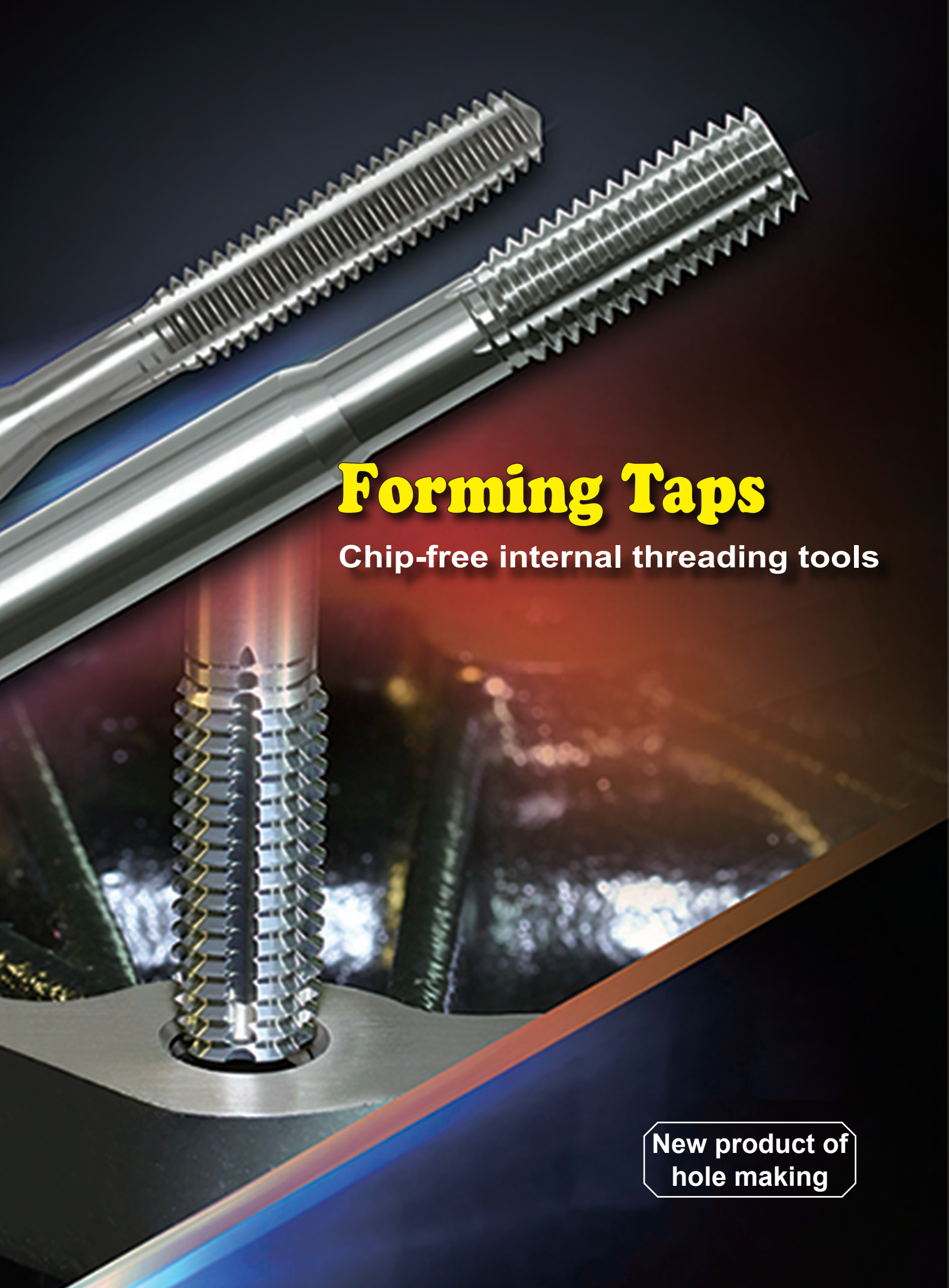


Common problems and solutions for reaming

Common problems	Solutions
Oversized holes	1.Reduce diameter of reamer. 2.The center of reamer is not in alignment with hole center. Adjust the concentricity of hole and reamer. 3.Radial run-out of reamer is too large. Good radial run-out is a key to successful reaming. 4.Scratches on reamer shank. 5.When using bushing and bushing, ensure shank is clean. 6.Select a suitable coolant. 7.Adjust cutting parameters.
Undersized holes	1.Increase diameter of reamer. 2.Reduce rotating speed. 3.Reduce the margin width. 4.Excessive tool abrasion, please conduct cutting after regrinding. 5.Thermal expansion coefficient of workpiece is too large. Please keep it cooled enough.
Poor hole roundness and linearity	1.Ensure better roundness of reamer chamfer. 2.Reamer rigidity is low. Make the overhang as short as possible in conditions of non-interference. 3.Check radial run-out after clamping reamer. 4.Adjust the concentricity of hole and reamer. 5.Ensure reaming allowance equality.
Poor hole surface quality	1.The hole surface roughness of entering part is bad. 2.Reduce rotating speed. 3.Ensure correct reaming allowance. The allowance being too large or too small would result in bad surface roughness. 4.Select the reamer with large chip pocket to avoid chip jamming. 5.Increase clearance angle of reamer entering part. 6.Check whether there is built-up on chamfer and margin land. 7.Increase the rigidity of machine, holder and reamer. 8.Check out whether the type of reamer head is suitable for the workpiece. 9.Increase the margin width and land width appropriately.
Hole precision is low	1.In return pass, the reamer should be pulled out of hole rotating at the same direction as before. Opposite rotation must be prohibited. 2.Reduce rotating speed. 3.Select the reamer with more lips. 4.Increase the margin width appropriately to enhance the guiding performance and extrusion effect. 5.Improve reamer lubricating property by surface treatment. 6.Select a suitable coolant.

Common problems and solutions for reaming

Common problems	Solutions
Reamer breakage, thermal damage	1.The guide hole is defective before reaming, for example, linearity is not good. 2.Adjust machining allowance to avoid tool breakage caused by too large allowance. 3.If the chip removal is obstructed, select a reamer with larger chip pocket. 4.Ensure sufficient coolant supply. 5.Adjust rotating speed and feed speed appropriately. 6.Increase the rigidity of machine, holder and reamer. 7.Improve the sharpness of reamer to make cutting easy and fast. 8.Excessive abrasion occurs on cutting edge, which means tool life has expired. It is recommended to change or regrind tool.
Damage on reamer shank	1.Check whether the shank hardness is enough. Too low hardness would cause deformation, and too high hardness may cause breakage. 2.Check the conjunction of holder and bushing. Do not use a defective holder.
Short tool life	1.Enhance the hardness of reamer cutting edge. 2.Select the reamer made by advanced material. 3.Check the coolant. 4.Use surface treatment for reamer such as nitride process. 5.Change the straight flute to helical flute. 6.Check all factors affecting machining precision.
Scratches on hole surface	1.Make sure no built-up is on the reamer surface. 2.Improve workpiece holding.
Trumpet-shaped entry hole	1.Improve workpiece holding. 2.Check radial run-out after clamping reamer. 3.The center of reamer is not in alignment with the hole center. Adjust the concentricity of hole and reamer.
Oversized holes	1.The center of reamer is not in alignment with hole center. Adjust the concentricity of hole and reamer. 2.Improve workpiece holding.

The image features two forming taps at the top, angled diagonally. Below them, a third tap is shown in the process of threading a hole into a metal workpiece, with bright sparks emanating from the cutting point. The background is a dark gradient with a blue and orange diagonal stripe at the bottom.

Forming Taps

Chip-free internal threading tools

**New product of
hole making**

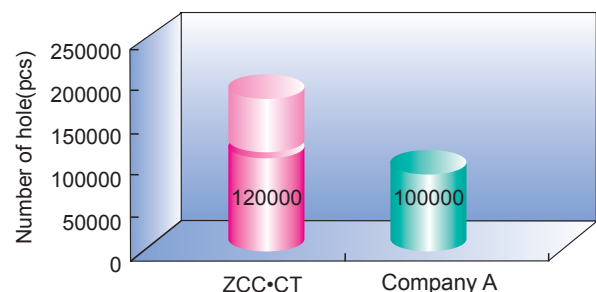
- ◆ Super micro grain cemented carbide with good toughness and abrasion resistance has long tool life.
- ◆ With particularly section-sharp design has good rigidity and strength.
- ◆ Thanks to the special technique treatment on cutting edge surface, threading quality is good and dimensional accuracy is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

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: $n=1300\text{r/min}$
 $F=1625\text{mm/min}$
 $h=29\text{mm}$, 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

Drilling Tools

How to choose the right solid carbide threading cutter

How to choose the right solid carbide threading cutter

Shape

Product name

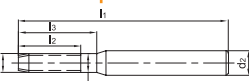
Product category

Solid carbide threading cutter

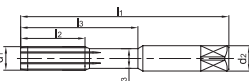
Application

Shape size

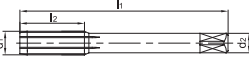
Forming taps -Al alloys machining



Picture 1



Picture 2



Picture 3



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			60°	Picture 1	3	●	0.9
4122AS-M1*0.25-6H		1.5P													
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													
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													
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													
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													
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													

● 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
YK40F			~40HRC	~50HRC	~60HRC			

Code key

C119

Cutting parameters

C134

Technical information

C135-C140

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.

BORING TOOLS

Threading cutter

C118	Solid carbide threading tools overview
C118	Icons information of solid carbide threading tools
C119	Code key of solid carbide threading tools
C120-C133	Detail information of solid carbide threading tools
C120-C131	Solid carbide threading cutters
C132-C133	Solid carbide threading end mills
C134	Recommended cutting parameters of solid carbide threading tools
C135-C140	Technical information of solid carbide threading tools

Threading cutter 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 alloy	High hardness steel		
Forming tap	4122A		M1~M2.5					○			C120	C134
	4222A		M3~M16					○			C120-121	C134
	4122M		M1~M2.5	○		○		○			C122	C134
	4222M		M3~M16	○		○		○			C122-123	C134
Helical-flute cutting taps	4201C		M3~M16				○				C124-125	C134
	4201A						○			C128-129	C134	
Straight-flute cutting tap	4202C		M3~M20				○				C126-127	C134
	4202A						○			C130-131	C134	
Threading end mills	4111		M5-M20	○	○		○	○			C133	C134

○ 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

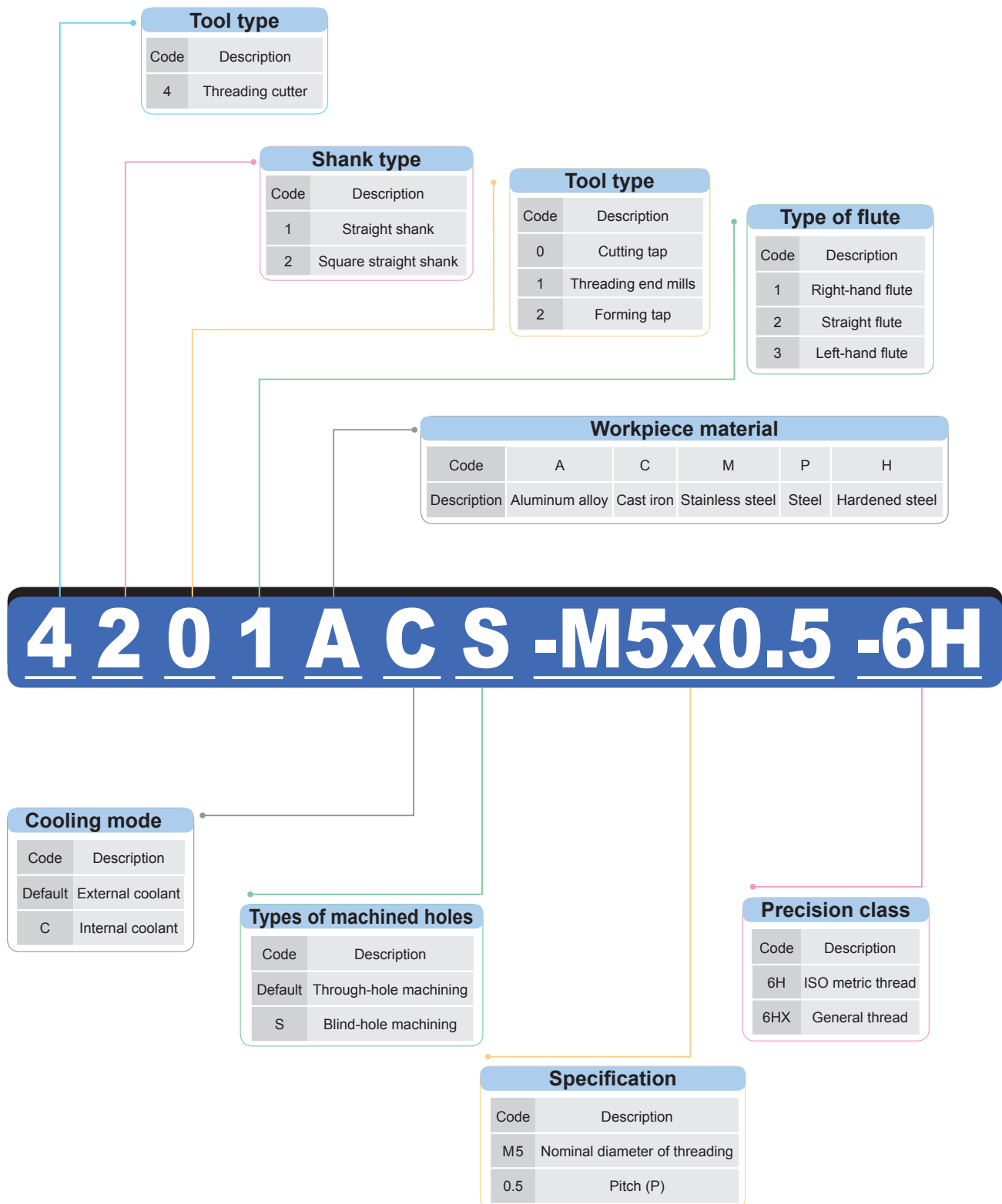


Precision class of screw thread

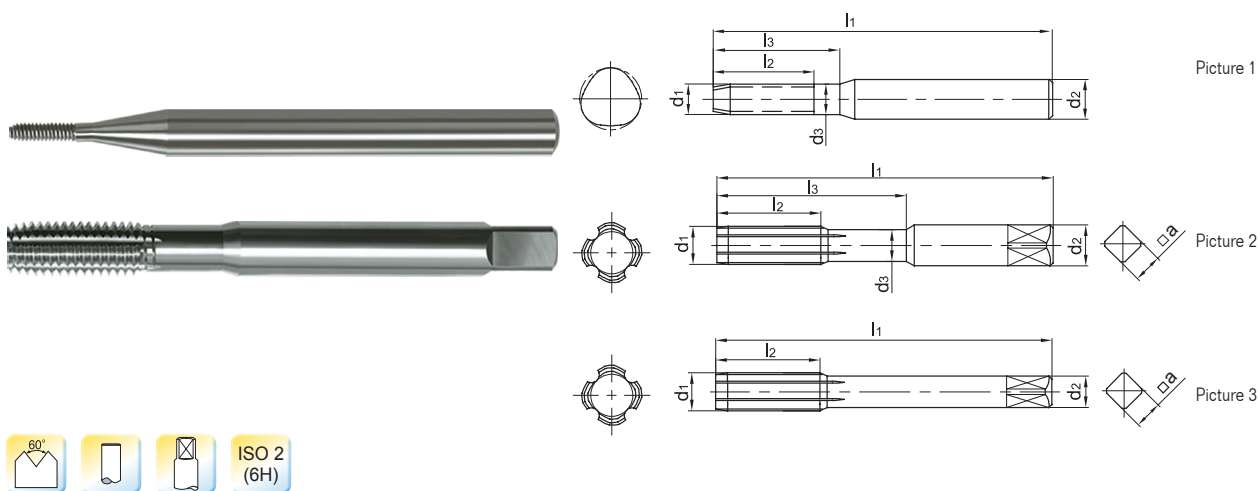


Precision class of screw thread

Threading cutter code key



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														
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														
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														
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														
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														
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	60°	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

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
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										Picture 2	4	●	7.45
4222A-M8*1.25-6H		3P	M8	1.25	8	6.4	90	16	35	6.2					
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	M10	1.5	10	8.1	100	20	39	8		Picture 2	5	●	9.35
4222ACS-M10*1.5-6H		1.5P													
4222A-M12*1.25-6H	External coolant	3P	M12	1.25	9		110	24		7	60°	Picture 3	5	●	11.45
4222AS-M12*1.25-6H		1.5P										Picture 3	5	●	11.35
4222A-M12*1.5-6H		3P	M12	1.5	9		110	24	7	Picture 3					
4222AS-M12*1.5-6H		1.5P													
4222A-M12*1.75-6H		3P	M12	1.75	9		110	24	7	Picture 3		5	●	11.25	
4222AS-M12*1.75-6H		1.5P													
4222AC-M12*1.75-6H	Internal coolant	3P	M12	1.75	9		110	24	7	Picture 3		5	●	11.25	
4222ACS-M12*1.75-6H		1.5P													
4222A-M14*1.5-6H	External coolant	3P	M14	1.5	11		110	26		9	60°	Picture 3	6	●	13.35
4222AS-M14*1.5-6H		1.5P										Picture 3	6	●	13.1
4222A-M14*2-6H		3P	M14	2	11		110	26	9	Picture 3					
4222AS-M14*2-6H		1.5P													
4222A-M16*1.5-6H		3P	M16	1.5	12		110	27		9		Picture 3	6	●	15.35
4222AS-M16*1.5-6H		1.5P													
4222A-M16*2-6H		3P	M16	2	12		110	27		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		Picture 3	6	●	15.1
4222ACS-M16*2-6H		1.5P													

● Stock available ○ Make-to-order

Drilling tools

Reaming Tools

Threading Cutter

Forming taps-Al alloys 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	Heat resistant alloy
YK40F			~40HRC	~50HRC	~60HRC				○	

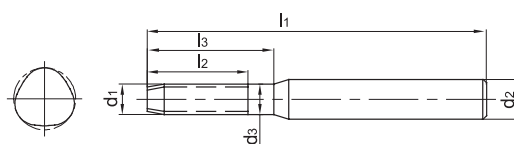
Code key C119 Cutting parameters C134 Technical information C135-C140



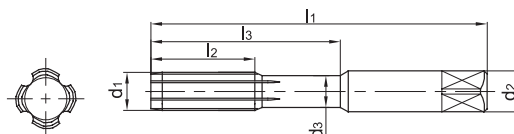
BORING TOOL Threading Cutter

Forming taps -Al alloys machining

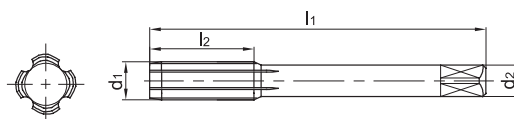
Forming taps -stainless steel machining



Picture 1



Picture 2



Picture 3



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	d
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														
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														
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														
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														
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														
4222M-M3*0.5-6H		3P	M3	0.5	3.5	2.3	56	6	18	2.7		Picture 2	4	●	○	2.8
4222MS-M3*0.5-6H		2P														
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														
4222M-M4*0.7-6H		3P	M4	0.7	4.5	3.1	63	8	21	3.4		Picture 2	4	●	○	3.7
4222MS-M4*0.7-6H		2P														
4222M-M5*0.5-6H		3P	M5	0.5	6	4.3	70	10	25	4.9		Picture 2	4	●	○	4.8
4222MS-M5*0.5-6H		2P														
4222M-M5*0.8-6H		3P	M5	0.8	6	4	70	10	25	4.9		Picture 2	4	●	○	4.65
4222MS-M5*0.8-6H		2P														
4222M-M6*0.75-6H		3P	M6	0.75	6	5	80	12	30	4.9		Picture 2	4	●	○	5.7
4222MS-M6*0.75-6H		2P														
4222M-M6*1-6H		3P	M6	1	6	4.7	80	12	30	4.9		Picture 2	4	●	○	5.6
4222MS-M6*1-6H		2P														
4222M-M7*1-6H		3P	M7	1	7	5.7	80	14	30	5.5		Picture 2	4	●	○	6.6
4222MS-M7*1-6H		2P														

● 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	KTG402	YK40F	d	
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	M10	1.5	10	8.1	100	20	39	8		Picture 2	5	●	○	9.35	
4222MCS-M10*1.5-6H		2P															
4222M-M12*1.25-6H	External coolant	3P	M12	1.25	9		110	24		7	60°	Picture 3	5	●	○	11.45	
4222MS-M12*1.25-6H		2P															
4222M-M12*1.5-6H		3P	M12	1.5	9		110	24		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		Picture 3	5	●	○	11.25	
4222MS-M12*1.75-6H		2P															
4222MC-M12*1.75-6H	Internal coolant	3P	M12	1.75	9		110	24		7		Picture 3	5	●	○	11.25	
4222MCS-M12*1.75-6H		2P															
4222M-M14*1.5-6H	External coolant	3P	M14	1.5	11		110	26		9	60°	Picture 3	6	●	○	13.35	
4222MS-M14*1.5-6H		2P															
4222M-M14*2-6H		3P	M14	2	11		110	26		9		Picture 3	6	●	○	13.1	
4222MS-M14*2-6H		2P															
4222M-M16*1.5-6H		3P	M16	1.5	12		110	27		9		Picture 3	6	●	○	15.35	
4222MS-M16*1.5-6H		2P															
4222M-M16*2-6H		3P	M16	2	12		110	27		9		Picture 3	6	●	○	15.1	
4222MS-M16*2-6H		2P															
4222MC-M16*2-6H	Internal coolant	3P	M16	2	12		110	27		9		Picture 3	6	●	○	15.1	
4222MCS-M16*2-6H		2P															

● Stock available ○ Make-to-order

Drilling tools

Reaming Tools

Threading Cutter

Forming taps-Al alloys 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	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KTG402	⊙					⊙					
YK40F	○					○			○		

Code key

C119

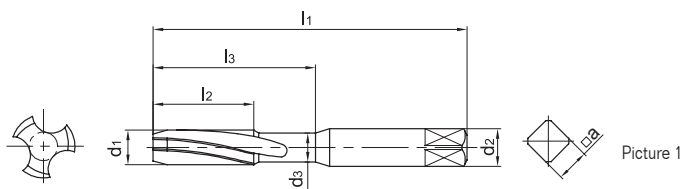
Cutting parameters

C134

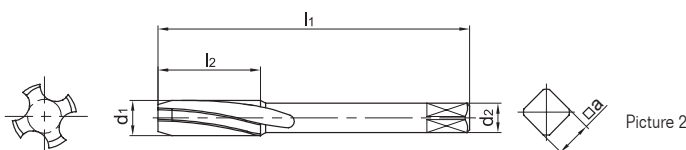
Technical information

C135-C140

Helical-flute cutting taps - cast iron 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	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	M7	1	7	5.7	80	19	30	5.5		Picture 1	3	●	6
4201CS-M6*1-6HX	1.5P													
4201C-M7*1-6H	3P													
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

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										Picture 1	4	●	8.75
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										Picture 1	4	●	8.75
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

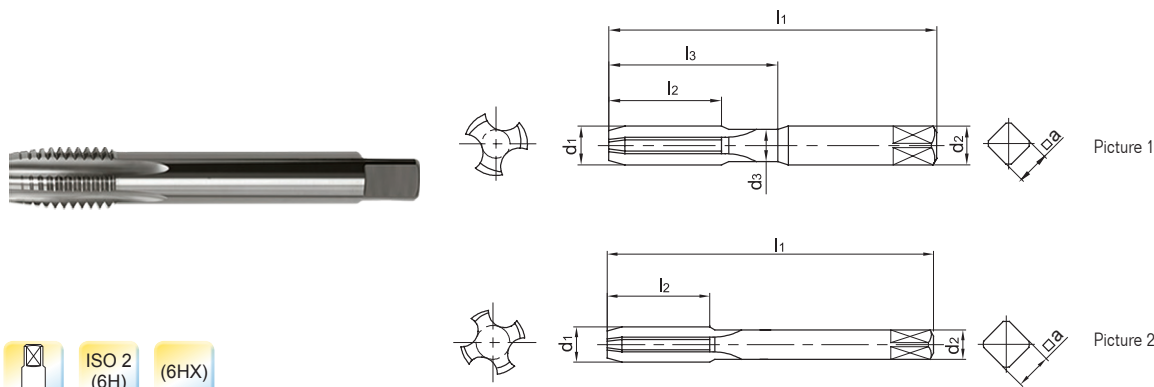
Applicable material table

○ 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							◎	◎			

Code key Cutting parameters Technical information

Straight-flute cutting tap - 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	M7	1	7	5.7	80	19	30	5.5		Picture 1	3	●	6
4202CS-M6*1-6HX	1.5P													
4202C-M7*1-6H	3P													
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													
4202CC-M8*1.25-6H	3P													
4202C-M8*1.25-6HX	3P	M8	1.25	8	6.4	90	22	35	6.2		Picture 1	3	●	6.75
4202CS-M8*1.25-6H	1.5P													
4202CCS-M8*1.25-6H	1.5P													
4202CS-M8*1.25-6HX	1.5P													

● Stock available ○ Make-to-order

Straight-flute cutting tap - 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	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
YK40F							◎	◎			

Code key

C119

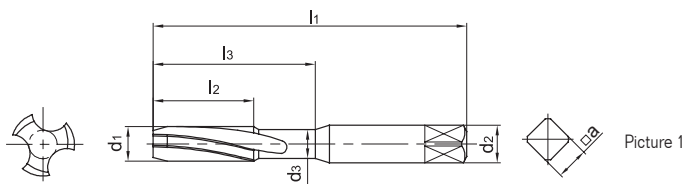
Cutting parameters

C134

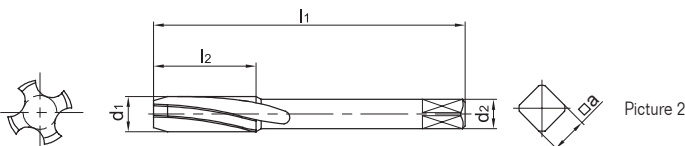
Technical information

C135-C140

Helical-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	YK40F	d
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													
4201ACS-M6*1-6H	1.5P													
4201AS-M6*1-6HX	1.5P													
4201A-M7*1-6H	3P	M7	1	7	5.7	80	19	30	5.5		Picture 1	3	●	6
4201AS-M7*1-6H	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

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	M10	1	10	8.7	100	20	39	8		Picture 1	4	●	9
4201A-M10*1-6H	3P													
4201AS-M10*1-6H	1.5P	M10	1.25	10	8.4	100	24	39	8		Picture 1	4	●	8.75
4201A-M10*1.25-6H	3P													
4201AS-M10*1.25-6H	1.5P	M10	1.5	10	8.1	100	24	39	8		Picture 1	4	●	8.5
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	M12	1.25	9		110	29		7		Picture 2	4	●	10.75
4201A-M12*1.25-6H	3P													
4201AS-M12*1.25-6H	1.5P	M12	1.5	9		110	29		7		Picture 2	4	●	10.5
4201A-M12*1.5-6H	3P													
4201AS-M12*1.5-6H	1.5P	M12	1.75	9		110	29		7		Picture 2	4	●	10.25
4201A-M12*1.75-6H	3P													
4201AC-M12*1.75-6H	3P													
4201A-M12*1.75-6HX	3P													
4201AS-M12*1.75-6H	1.5P													
4201ACS-M12*1.75-6H	1.5P													
4201AS-M12*1.75-6HX	1.5P	M14	1.5	11		110	30		9		Picture 2	4	●	12.5
4201A-M14*1.5-6H	3P													
4201AS-M14*1.5-6H	1.5P	M14	2	11		110	30		9		Picture 2	4	●	12
4201A-M14*2-6H	3P													
4201AS-M14*2-6H	1.5P	M16	1.5	12		110	32		9		Picture 2	4	●	14.5
4201A-M16*1.5-6H	3P													
4201AS-M16*1.5-6H	1.5P	M16	2	12		110	32		9		Picture 2	4	●	14
4201A-M16*2-6H	3P													
4201A-M16*2-6HX	3P													
4201AS-M16*2-6H	1.5P													
4201AS-M16*2-6HX	1.5P													

● Stock available ○ Make-to-order

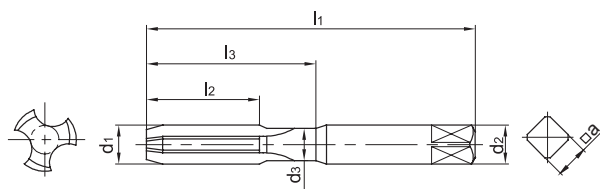
Applicable material table

○ Very suitable ○ Suitable

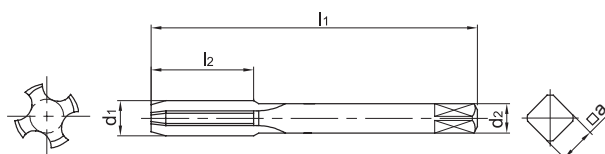
Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
YK40F									◎		

Code key C119 Cutting parameters C134 Technical information C135-C140

Straight-flute cutting tap - 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	YK40F	d
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													
4202AS-M6*1-6HX	1.5P													
4202A-M7*1-6H	3P	M7	1	7	5.7	80	19	30	5.5		Picture 1	3	●	6
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

Straight-flute cutting tap - 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	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
YK40F									◎		

Code key C119 Cutting parameters C134 Technical information C135-C140

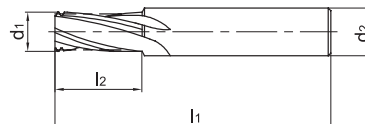
Helical-flute cutting taps --Al alloys machining



Newly upgraded!

Solid carbide
Thread end mills

Thread end 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	
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	Heat resistant alloy
			~40HRC	~50HRC	~60HRC						
KTG4015	○	⊗	○				○	○			
YK40F							○		○	○	

Code key

C119

Cutting parameters

C134

Technical information

C135-C140

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 end mills

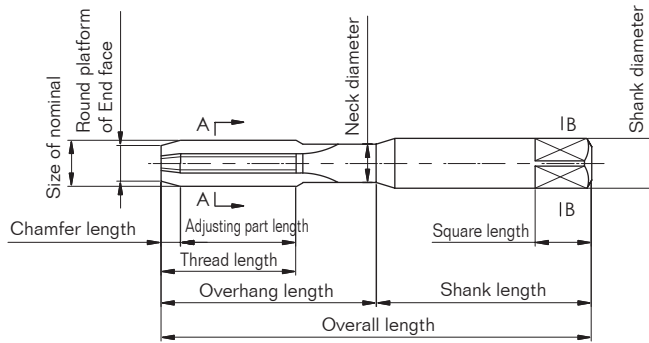
Workpiece material	Cutting speed (m/min)		Feed rate (mm/z)	
	Uncoated	Coated	D ≤ 8	D > 8
Alloy steel、Common steel	20~60	40~120	0.02~0.05	0.04~0.12
Aluminium alloy	100~250	---	0.05~0.2	

Note:

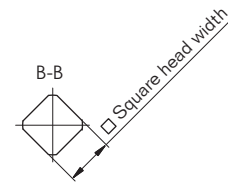
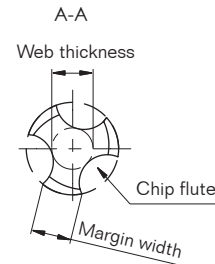
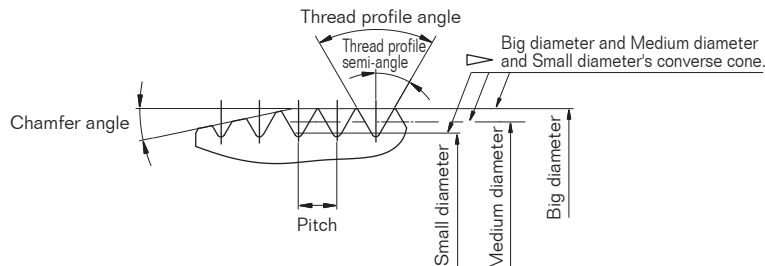
The tool entering feed is less than 70% of threading feed. It is in direct proportion to the diameter of the tap. The above cut parameters are suitable for thread cutters with helical flute. Please reduce feed rate and cutting speed by 20% ~ 40% if it is straight-flute tools.

Tap

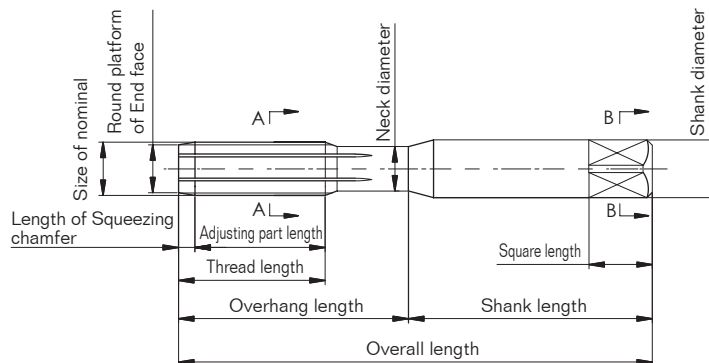
Parts terminology of cutting taps



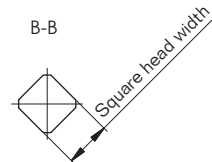
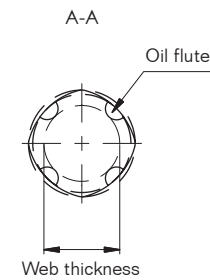
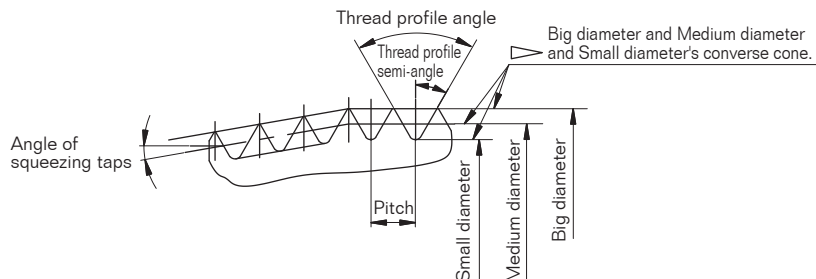
Magnifying fig of chamfer and thread profile



Parts terminology of forming taps



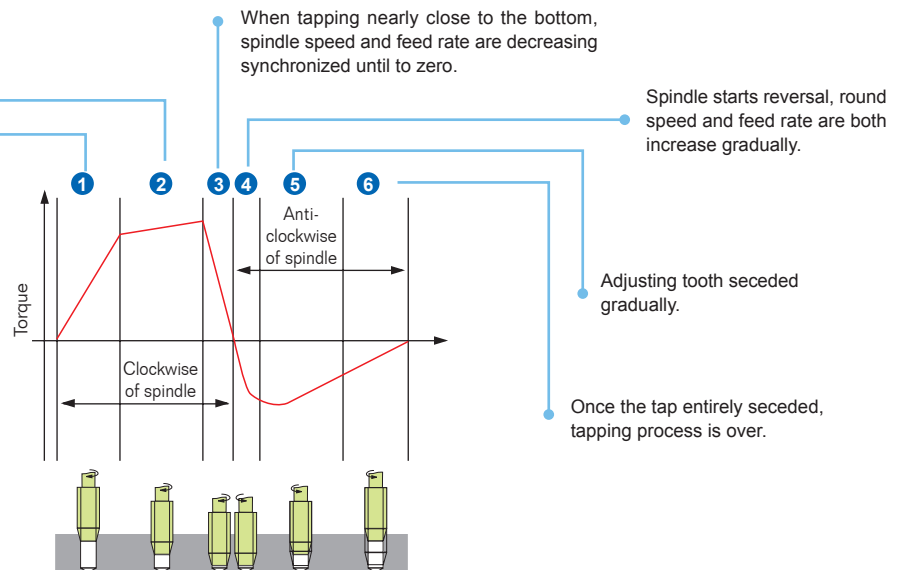
Magnifying fig of squeezing chamfer and guided threads



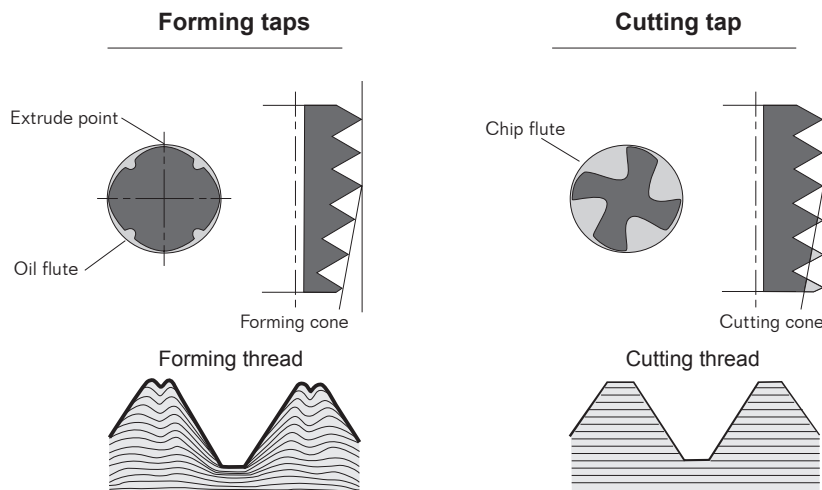
Process of tapping and tapping torques

Cutting (forming) chamfer participates in machining process. Meanwhile, the tooth of correction plays a role in correcting and directing. Also, torques are gradually reached at a peak at that time.

While it begins to machine, cutting (forming) chamfer will get into the workpiece gradually. In addition, machined torques appear to be increased by linear.



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 chunks.

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

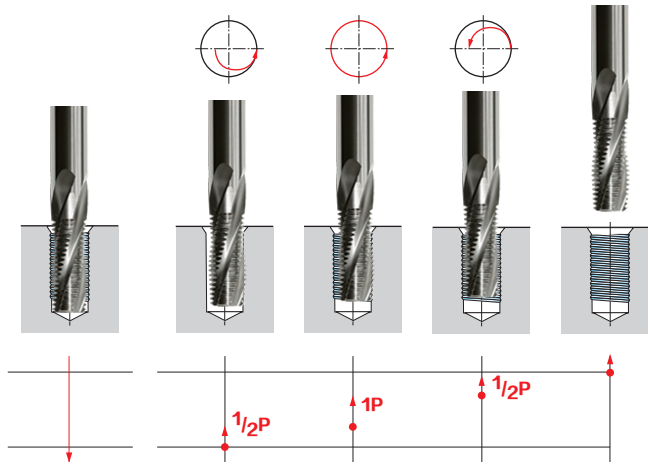
Classification	Advantages	Disadvantages	Recommend applications
Straight-flute taps 	● general performance is good ● high cutting edge strength ● easy to regrind	● large cutting torque by machining ● bad chip-breaking and chip removal ability ● cannot tapping to the bottom of blind holes	● for machining of high hardness material ● material generating powdered chips ● material easy to cause abrasion ● tap shot through and blind hole
Helical-flute taps 	● 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	● bad cutting edge strength ● easily fall in tooth when seceding	● tap long through and blind hole ● material generating long curling chips ● the hole with axial slot on inner wall
Forming taps 	● no chips ● high precision of internal thread ● high tool strength ● available for tapping to the bottom of blind holes	● only for machining of specific material ● high requirement of pre-hole ● high requirement of lubrication liquid	● for soft materials with good toughness and ductility ● tap through and blind hole

The common problems in tapping

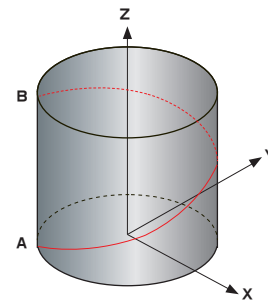
Common problems	Reasons	Solutions
Too large Internal thread	Wrong tap type selection	Selecting right tap according to work materials and requirement
	Pre-hole is too large	Select appropriate prehole drills
	Pre-hole is off center	Improve prehole quality
		Change to floated tapping method
	Axial feed 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
Too small internal thread	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
	Wrong selection of tap tolerance level	Select taps with right tolerance
Thread disorderly buckle	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
	When starts tapping, force too much press on right helical taps	Decrease pressure when starts tapping
Unsmooth on internal thread surface	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
	Wrong selection of taps	Selecting right tap according to work materials and requirement
Tap breakage	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
	Too small pre-hole	Adjust pre-hole drill
Tap breakage	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

Threading end mills

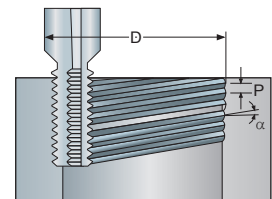
Thread end mills (graphic demonstration)



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.



Picture A

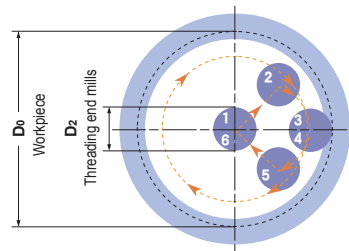


α : helical angle
D: large-diameter
p: pitch

Picture B

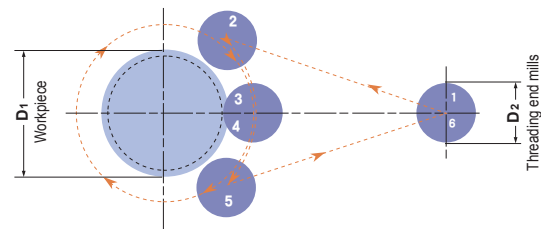
Arc entering method

Internal 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

External thread



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

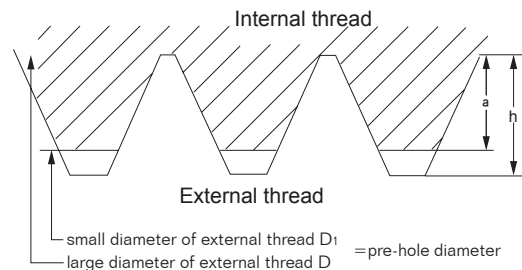
Arc entering: placidly entering and out leads to almost no cutting traces or vibration, so that it is particularly suitable for materials difficult to be machined and precise threading.

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.

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

while external thread appears to be standardized tooth



$a = 1/2 \times (D - D_1)$
 $h = \text{height of standard tooth of external thread}$
chimerism ratio $= a/h \times 100\%$

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