

WILSON

威爾遜



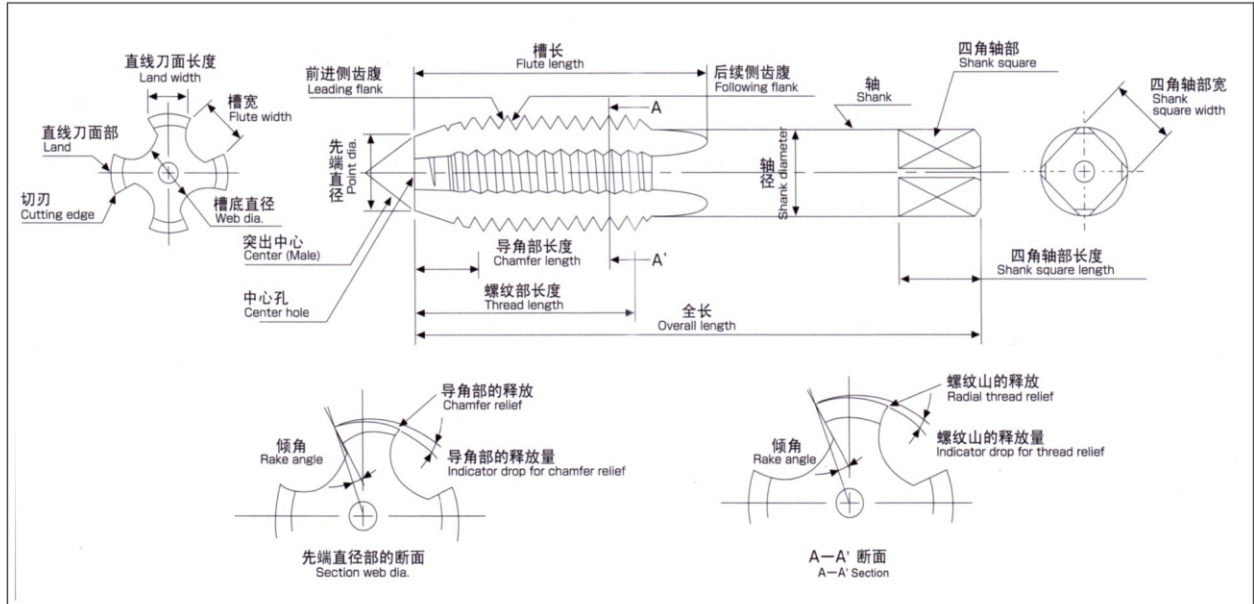
威爾遜螺紋工具
WILSON THREAD TOOL

切削丝锥 cutting taps

切削丝攻为加工母螺纹的工具，包括手用丝攻，螺旋丝攻，先端丝攻，管用丝攻，螺母丝攻等等。

Cutting taps are used as a machining tool for production of interna threads.They include straight fluted taps(hand taps),spiral fluted taps.spiral pointed taps,as wel l as pipe thread taps and nut taps

切削丝攻的各部位名称 Terminology



导角部位Chamfer

切削丝攻上，导角作为切削刃是很重要的部分。为了通过导角长，角度，槽数的不同达到合适的切削水准，各个种类的切削丝攻有其作为基准的导角长和导角部角度。

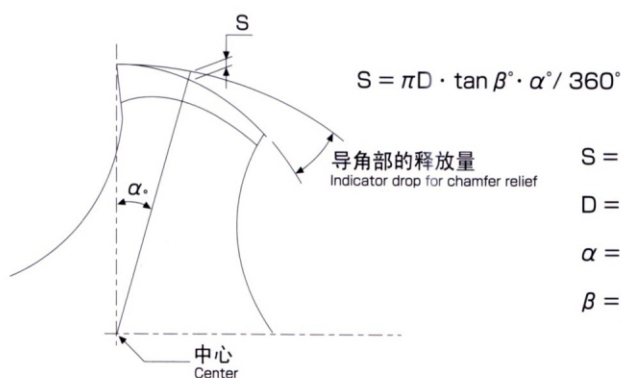
This is an important element in cutting taps.providing the teeth for cutting.To ensure appropriate sharpness(according to chamfer length,chamfer angle and number of flutes).each cutting tap has its standard Chamfer length and Chamfer angle.

丝攻种类 Types of taps		导角部长度 Chamfer lenl8th	导角部角度 Chamfer angle
手用丝攻 Hand taps	前部 Taper	9牙 9 pitches	4° 4 degrees
	中部 Plug	5牙 5 pitches	7.5° 7.5 degrees
	上部 Bottoming	1.5牙 1.5 pitches	24° 24 degrees
螺旋丝攻 spiral fluted taps		2.5牙 · 3牙 2.5pitches · 3pitches	15° · 12.5 15 · 12.5degrees
线段丝攻 spiral pointed taps(gun taps)		4牙 · 5牙 4pitches · 5pitches	9.5° · 7.5 9.5 · 7.5degrees
管用平行螺丝用丝攻 parallel pipe thread taps		1.5牙 · 3.5牙 1.5pitches · 3.5pitches	25° · 11.5 25 · 11.5degrees
锥管螺纹用丝攻 taper pipe thread taps	平行螺纹用 parallel threads	1.5牙 · 3.5牙 1.5pitches · 3.5pitches	25° · 11.5 25 · 11.5degrees
	锥度螺纹用 taper threads	2.5牙 2.5pitches	16° 16degrees
螺母丝攻 nut taps		螺纹部长度的75% 75%of thread length	1.5° 1.5degrees

切削丝锥 cutting taps

导角部位的各个切削刃，通过丝攻的回转将所要求的切削的规定量进行分担切削，通过导角部位将母螺纹成型。完全螺纹山部分与成型后母螺纹的螺纹山咬合，起到将丝攻导入的目的。一般来说，导角部位长度越长，螺纹精度和完成面越好，但是因为存在被切削材质与母螺纹形状的限制，如果丝攻采用基准以外的导角长度，可能会给丝攻的性能造成影响。

切削丝攻的再研磨一般是对导角部的再研磨，针对导角部的长度的导角部角度之外，导角部的释放量的设定会左右丝攻的切削水平，是重要的要素。利用以下的算式设置各尺寸丝攻的导角部的合适的释放量。



- S = 导角第二释放量
Secondary indicator drop for chamfer relief
- D = 尺寸
Size
- α = 测定位置的角度
Angle of measurement position
- β = 导角第二角度
Secondary relief angle

倾角 Rake angle

倾角根据被切削材质设定。不同的被切削材质拥有不同的机械性质，因此有必要设定合适的角度和形状：切削作业中排出的切屑因为倾角的不同而变化，倾角还含有存放切屑的复合功能。

有代表性的槽的形状，包括相对于丝攻轴的直槽，螺旋槽，以及在导角部位的倾斜槽。根据不同的攻牙作业用途选用这些槽。根据倾角，倾斜形状，槽形状这三要素，满足被切削材质的适应条件。

The rake angle is set according to the material being tapped. Since mechanical properties differ among materials, appropriate angles and shapes are required. Chips ejected by tapping change according to the rake angle, and compounded elements such as storing chips are included.

Flute shape is classified into straight flute, spiral flute and spiral pointed flute (which has an inclined chamfer). Assuming proper usage according to the particular tapping purpose, the optimum requirements of any given material are satisfied by correct rake angle, rake shape and flute shape.

各个被加工材料的倾角与倾斜形状

Rake angle and rake shape by work materia

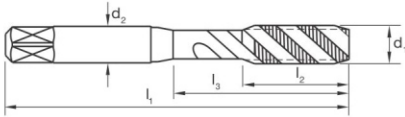
被加工材料 Work material	倾角(°) Rake angle(°)	倾斜形状 shape of rake
低碳素钢 Low-carbon steel	10 ~ 13	H
高碳素钢 High-carbon steel	5 ~ 7	R
工具钢 Tool steel	5 ~ 7	R
不锈钢 Stainless steel	10 ~ 13	R
铬钢 Chromi	10 ~ 13	R
锰钢 Manganese steel	10 ~ 13	H
铸钢 Cast steel	10 ~ 13	R

被加工材料 work material	倾角(°) Rake angle(°)	倾斜形状 shape of rake
铸铁 Cast iron	2 ~ 4	R
铝 Aluminum	16 ~ 20	H
铝合金 Aluminum alloy	12 ~ 14	H
铜 Copper	16	R
黄铜 Brass	3 ~ 5	R
青铜 Bronze	1 ~ 3	R
合成树脂 Synthetic resin	3 ~ 5	R

注：H为挂钩状，R为倾斜状(请参考P.163图1, 2) Note: H=hook-shaped. R=rake-shaped(see Fig. 1. Fig. 2 in page 163)

丝锥特性:
taps spec:

- 普通通用型丝锥，一般用途
universal tap, for general purpose
- 攻牙深度: $\leq 2XD$
cutting length: $\leq 2XD$
- TIN通用型的性价比最高
tin general will be better



material 刀具材料	HSSE	HSSE	HSSE
type 型号	N R38	N R38	N R38
surface treatment 表面处理	BRT	TIN	TICN
cutting angle 切削角	2.5P	2.5P	2.5P
tolerance 公差	6H	6H	6H
cutting direction 切削方向	R	R	R

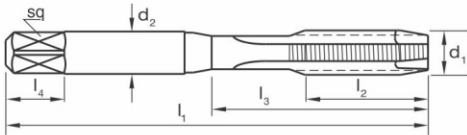
d1	pitch	l1	l2	l3	d2	z	dir l1	square length			
M2	0.4	50	8	14	3.0	2	2.5	5	●	●	●
M2.5	0.45	50	9	15	3.0	3	2.5	5	●	●	●
M3	0.5	50	10	18	4.0	3	3.2	6	●	●	●
M3.5	0.6	50	10	18	4.0	3	3.2	6	○	○	○
M4	0.7	57	13	21	5.0	3	4.0	7	●	●	●
	0.5	57	10	21	5.0	3	4.0	7	○	○	○
M5	0.8	64	16	25	5.5	3	4.5	7	●	●	●
	0.5	64	10	25	5.5	3	4.5	7	○	○	○
M6	1	67	19	28	6.3	3	5.0	7	○	○	○
	0.75	67	15	28	6.3	3	5.0	7	○	○	○
	0.5	67	10	29	6.3	3	5.0	7	○	○	○
M8	1.25	70	20	36	6.3	3	5.0	8	●	●	●
	1	70	20	36	6.3	3	5.0	8	●	●	●
M10	1.5	80	24	41	8.0	3	6.3	9	●	●	●
	1.25	80	19	41	8.0	3	6.3	9	●	●	●
	1	80	19	41	8.0	3	6.3	9	○	○	○
M11	0.75	89	19	45	9.0	3	7.1	9	○	○	○
	1	89	19	45	9.0	3	7.1	9	○	○	○
	1.5	89	24	45	9.0	3	7.1	9	○	○	○
M12	1.75	89	29	45	9.0	3	7.1	10	●	●	●
	1.5	89	22	45	9.0	3	7.1	10	●	●	●
	1.25	89	22	45	9.0	3	7.1	10	●	●	●
	1	89	22	45	9.0	3	7.1	10	○	○	○
M14	2	90	30	48	11.2	3	9.0	12	●	●	●
	1.5	90	22	48	11.2	3	9.0	12	●	●	●
	1.25	90	22	48	11.2	3	9.0	12	○	○	○
	1	90	22	48	11.2	3	9.0	12	○	○	○
M16	2	102	32	52	12.5	4	10.0	13	●	●	●
	1.5	102	22	52	12.5	4	10.0	13	●	●	●
	1	102	22	52	12.5	4	10.0	13	○	○	○
M18	2.5	112	37	57	14.0	4	11.2	14	●	●	●
	2	112	37	57	14.0	4	11.2	14	●	●	●
	1.5	112	22	57	14.0	4	11.2	14	●	●	●
	1	112	22	57	14.0	4	11.2	14	○	○	○
M20	2.5	112	37	57	14.0	4	11.2	14	●	●	●
	2	112	37	57	14.0	4	11.2	14	●	●	●
	1.5	112	22	57	14.0	4	11.2	14	●	●	●
	1	112	22	57	14.0	4	11.2	14	○	○	○

○ need to produce

● in stock

丝锥特性:
taps spec:

- 普通泛用型丝锥, 一般用途
universal tap, for general purpose
- 攻牙深度: $\leq 3XD$
cutting length: $\leq 3XD$
- TIN通用型的性价比最高
tin general will be better



material 刀具材料	HSSE	HSSE	HSSE
type 型号	N	N	N
surface treatment 表面处理	BRT	TIN	TICN
cutting angle 切削锥	5P	5P	5P
tolerance 公差	6H	6H	6H
cutting direction 切削方向	R	R	R

d1	pitch	l1	l2	l3	d2	z	dir:l1	square length			
M2	0.4	50	8	14	3.0	2	2.5	5	●	●	●
M2.5	0.45	50	9	15	3.0	3	2.5	5	●	●	●
M3	0.5	50	10	18	4.0	3	3.2	6	●	●	●
M3.5	0.6	50	10	18	4.0	3	3.2	6	○	○	○
M4	0.7	57	13	21	5.0	3	4.0	7	●	●	●
	0.5	57	10	21	5.0	3	4.0	7	○	○	○
M5	0.8	64	16	25	5.5	3	4.5	7	●	●	●
	0.5	64	10	25	5.5	3	4.5	7	○	○	○
M6	1	67	19	28	6.3	3	5.0	7	○	○	○
	0.75	67	15	28	6.3	3	5.0	7	○	○	○
	0.5	67	10	29	6.3	3	5.0	7	○	○	○
M8	1.25	70	20	36	6.3	3	5.0	8	●	●	●
	1	70	20	36	6.3	3	5.0	8	●	●	●
M10	1.5	80	24	41	8.0	3	6.3	9	●	●	●
	1.25	80	19	41	8.0	3	6.3	9	●	●	●
	1	80	19	41	8.0	3	6.3	9	○	○	○
M11	0.75	89	19	45	9.0	3	7.1	9	○	○	○
	1	89	19	45	9.0	3	7.1	9	○	○	○
	1.5	89	24	45	9.0	3	7.1	9	○	○	○
M12	1.75	89	29	45	9.0	3	7.1	10	●	●	●
	1.5	89	22	45	9.0	3	7.1	10	●	●	●
	1.25	89	22	45	9.0	3	7.1	10	●	●	●
	1	89	22	45	9.0	3	7.1	10	○	○	○
M14	2	90	30	48	11.2	3	9.0	12	●	●	●
	1.5	90	22	48	11.2	3	9.0	12	●	●	●
	1.25	90	22	48	11.2	3	9.0	12	○	○	○
	1	90	22	48	11.2	3	9.0	12	○	○	○
M16	2	102	32	52	12.5	4	10.0	13	●	●	●
	1.5	102	22	52	12.5	4	10.0	13	●	●	●
	1	102	22	52	12.5	4	10.0	13	○	○	○
M18	2.5	112	37	57	14.0	4	11.2	14	●	●	●
	2	112	37	57	14.0	4	11.2	14	●	●	●
	1.5	112	22	57	14.0	4	11.2	14	●	●	●
	1	112	22	57	14.0	4	11.2	14	○	○	○
M20	2.5	112	37	57	14.0	4	11.2	14	●	●	●
	2	112	37	57	14.0	4	11.2	14	●	●	●
	1.5	112	22	57	14.0	4	11.2	14	●	●	●
	1	112	22	57	14.0	4	11.2	14	○	○	○

- need to produce
- in stock

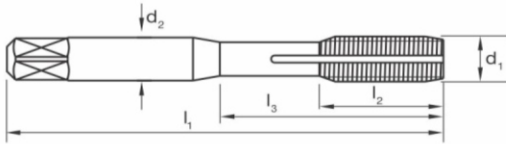
公制挤压丝锥 metric standard rolling taps

丝锥特性:

taps spec:

- 短牙设计, 干扰更小
short flute design ,small interference
- TIN通用型的性价比最高
tin gernal will be better

●适用软金属, ≥10%延伸性材质加工 (铜, 铝, 不锈钢...)
suitable for soft steel ≥10%extensibility material (copper,aluminum stainless steel



material 刀具材料	HSSE	HSSE	HSSE
type 型号	N	N	N
surface treatment 表面处理	BLU(OXIDATION)	TIN	TICN
tolerance 公差	6H	6H	6H
cutting direction 切削方向	R	R	R

d1	pitch	l1	l2	l3	d2	z	dir1	square length			
M2	0.4	50	7	13	3.0	2	2.5	5	●	●	●
M2.5	0.45	50	8	14	3.0	3	2.5	5	●	●	●
M3	0.5	50	9	17	4.0	3	3.2	6	●	●	●
M3.5	0.6	50	11	19	4.0	3	3.2	6	●	●	●
M4	0.7	57	11	19	5.0	3	4.0	7	●	●	●
	0.5	57	9	19	5.0	3	4.0	7	○	○	○
M5	0.8	64	13	22	5.5	3	4.5	7	●	●	●
	0.5	64	9	22	5.5	3	4.5	7	○	○	○
M6	1	67	15	26	6.3	3	5.0	7	●	●	●
	0.75	67	15	26	6.3	3	5.0	7	●	●	●
	0.5	67	9	26	6.3	3	5.0	7	○	○	○
M8	1.25	70	19	34	6.3	3	5.0	8	●	●	●
	1	70	19	34	6.3	3	5.0	8	○	○	○
M10	1.5	80	23	37	8.0	3	6.3	9	●	●	●
	1.25	80	23	37	8.0	3	6.3	9	●	●	●
	1	80	23	37	8.0	3	6.3	9	○	○	○
M11	0.75	89	19	45	9.0	3	7.1	9	○	○	○
	1	89	19	45	9.0	3	7.1	9	○	○	○
	1.5	89	24	45	9.0	3	7.1	9	○	○	○
	1.75	89	29	45	9.0	3	7.1	10	●	●	●
M12	1.5	89	22	45	9.0	3	7.1	10	●	●	●
	1.25	89	22	45	9.0	3	7.1	10	●	●	●
	1	89	22	45	9.0	3	7.1	10	○	○	○
	2	90	30	48	11.2	3	9.0	12	●	●	●
M14	1.5	90	22	48	11.2	3	9.0	12	●	●	●
	1.25	90	22	48	11.2	3	9.0	12	○	○	○
	1	90	22	48	11.2	3	9.0	12	○	○	○
	2	102	32	52	12.5	4	10.0	13	●	●	●
M16	1.5	102	22	52	12.5	4	10.0	13	●	●	●
	1	102	22	52	12.5	4	10.0	13	○	○	○
	2.5	112	37	57	14.0	4	11.2	14	●	●	●
M18	2	112	37	57	14.0	4	11.2	14	●	●	●
	1.5	112	22	57	14.0	4	11.2	14	●	●	●
	1	112	22	57	14.0	4	11.2	14	○	○	○
	2.5	112	37	57	14.0	4	11.2	14	●	●	●
M20	2	112	37	57	14.0	4	11.2	14	●	●	●
	1.5	112	22	57	14.0	4	11.2	14	●	●	●
	1	112	22	57	14.0	4	11.2	14	○	○	○

○ need to produce

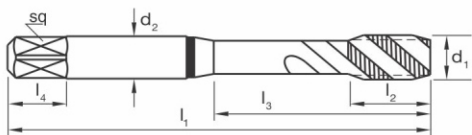
● in stock

公制铝用螺旋丝锥 metric standard aluminum special taps

丝锥特性:

taps spec:

- 两刃45° 螺旋角设计, 加大排屑空间, 快速有效排出铁屑
2 flute 45 spiral angle design ,increased chip removal space,rapid and effective to removal the chip
- 攻牙深度: $\leq 3XD$
cutting length $\leq 3XD$
- 特别适合铝材切削 (纯铝, 锻造铝, 压铸铝 $\leq 5\%$ 硅, 铜)
suitable for aluminum (aluminum, cast aluminum,die-casting aluminum $\leq 5\%$ si copper)



material	刀具材料	HSSE	HSSE	HSSE
type	型号	N R45	N R45	N R45
surface treatment	表面处理	BRT	TIN	TICN
cutting angle	切削锥	2.5P	2.5P	2.5P
tolorance	公差	6H	6H	6H
cutting direction	切削方向	R	R	R

d1	pitch	11	12	13	D1	z	square	square length			
M2	0.4	50	8	15	3.0	2	2.5	5	●	●	○
M2.5	0.45	50	9	16	3.0	2	2.5	5	●	●	○
M3	0.5	50	5	18	4.0	2	3.2	6	●	●	○
M3.5	0.6	50	5	18	4.0	2	3.2	6	●	●	○
M4	0.7	57	7	20	5.0	2	4.0	7	●	●	○
	0.5	57	7	20	5.0	2	4.0	7	○	○	○
M5	0.8	64	9	24	5.5	2	4.5	7	●	●	○
	0.5	64	9	24	5.5	2	4.5	7	○	○	○
M6	1	67	10	28	6.3	2	5.0	7	●	●	○
	0.75	67	10	28	6.3	2	5.0	7	●	●	○
	0.5	67	7	28	6.3	2	5.0	7	○	○	○
M7	1	70	10	34	6.3	2	5.0	8	○	○	○
	0.75	70	10	34	6.3	2	5.0	8	○	○	○
M8	1.25	70	12	34	6.3	2	5.0	8	●	●	○
	1	70	10	34	6.3	2	5.0	8	●	●	○
M10	1.5	80	13	39	8.0	2	6.3	9	●	●	○
	1.25	80	13	39	8.0	2	6.3	9	●	●	○
	1	80	10	39	8.0	2	6.3	9	○	○	○
M12	1.75	89	15	44	9.0	2	7.1	10	●	●	○
	1.5	89	15	44	9.0	2	7.1	10	●	●	○
	1.25	89	15	44	9.0	2	7.1	10	●	●	○
	1	89	10	44	9.0	2	7.1	10	○	○	○

○ need to produce

● in stock

公制不锈钢螺旋丝锥 metric stainless steel special taps

丝锥特性:

taps spec:

● 45° 螺旋角设计, 有效排出长条型铁屑

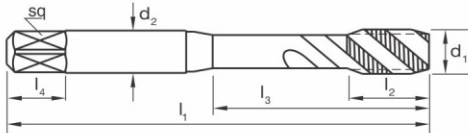
45 spiral angle design, effective to removal strip chip

● 攻牙深度: $\leq 3XD$

cutting length $\leq 3XD$

● 切削不锈钢材质, TiCN涂层更好保证刀具耐磨性

suitable for stainless steel, tcn coating will be increase taps abrasive resistance



material	刀具材料	HSSE	HSSE	HSSE
type	型号	N R45	N R45	N R45
surface treatment	表面处理	BRT	TIN	TICN
cutting angle	切削角	2.5P	2.5P	2.5P
tolerance	公差	6H	6H	6H
cutting direction	切削方向	R	R	R

d1	pitch	l1	l2	l3	D1	z	square	square length			
M2	0.4	50	8	15	3.0	2	2.5	5	●	●	○
M2.5	0.45	50	9	16	3.0	2	2.5	5	●	●	○
M3	0.5	50	5	18	4.0	2	3.2	6	●	●	○
M3.5	0.6	50	5	18	4.0	2	3.2	6	●	●	○
M4	0.7	57	7	20	5.0	2	4.0	7	●	●	○
	0.5	57	7	20	5.0	2	4.0	7	○	○	○
M5	0.8	64	9	24	5.5	2	4.5	7	●	●	○
	0.5	64	9	24	5.5	2	4.5	7	○	○	○
M6	1	67	10	28	6.3	2	5.0	7	●	●	○
	0.75	67	10	28	6.3	2	5.0	7	●	●	○
	0.5	67	7	28	6.3	2	5.0	7	○	○	○
M7	1	70	10	34	6.3	2	5.0	8	○	○	○
	0.75	70	10	34	6.3	2	5.0	8	○	○	○
M8	1.25	70	12	34	6.3	2	5.0	8	●	●	○
	1	70	10	34	6.3	2	5.0	8	●	●	○
M10	1.5	80	13	39	8.0	2	6.3	9	●	●	○
	1.25	80	13	39	8.0	2	6.3	9	●	●	○
	1	80	10	39	8.0	2	6.3	9	○	○	○
M12	1.75	89	15	44	9.0	2	7.1	10	●	●	○
	1.5	89	15	44	9.0	2	7.1	10	●	●	○
	1.25	89	15	44	9.0	2	7.1	10	●	●	○
	1	89	10	44	9.0	2	7.1	10	○	○	○

○ need to produce

● in stock

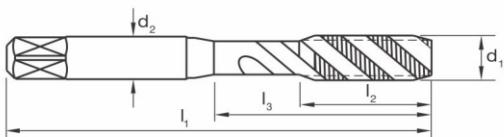
铸铁专用螺旋丝锥 cast iron special taps

丝锥特性:

taps spec:

● 15° 螺旋角设计, 增强刀刃强度
15 spiral angle design enhanced edge strength

● 攻牙深度: $\leq 2XD$
cutting length $\leq 3XD$



material	刀具材料	HSSE	HSSE	HSSE
type	型号	NR45	NR45	NR45
surface treatment	表面处理	BRT	TIN	TICN
cutting angle	切削锥	2.5P	2.5P	2.5P
tolerance	公差	6H	6H	6H
cutting direction	切削方向	R	R	R

d1	pitch	l1	l2	l3	d2	z	dir1	square length			
M2	0.4	50	8	14	3.0	2	2.5	5	●	●	●
M2.5	0.45	50	9	15	3.0	3	2.5	5	●	●	●
M3	0.5	50	10	18	4.0	3	3.2	6	●	●	●
M3.5	0.6	50	10	18	4.0	3	3.2	6	○	○	○
M4	0.7	57	13	21	5.0	3	4.0	7	●	●	●
	0.5	57	10	21	5.0	3	4.0	7	○	○	○
M5	0.8	64	16	25	5.5	3	4.5	7	●	●	●
	0.5	64	10	25	5.5	3	4.5	7	○	○	○
M6	1	67	19	28	6.3	3	5.0	7	●	●	●
	0.75	67	15	28	6.3	3	5.0	7	○	○	○
	0.5	67	10	29	6.3	3	5.0	7	○	○	○
M8	1.25	70	20	36	6.3	3	5.0	8	●	●	●
	1	70	20	36	6.3	3	5.0	8	●	●	●
M10	1.5	80	24	41	8.0	3	6.3	9	●	●	●
	1.25	80	19	41	8.0	3	6.3	9	●	●	●
	1	80	19	41	8.0	3	6.3	9	○	○	○
M11	0.75	89	19	45	9.0	3	7.1	9	○	○	○
	1	89	19	45	9.0	3	7.1	9	○	○	○
	1.5	89	24	45	9.0	3	7.1	9	○	○	○
M12	1.75	89	29	45	9.0	3	7.1	10	●	●	●
	1.5	89	22	45	9.0	3	7.1	10	●	●	●
	1.25	89	22	45	9.0	3	7.1	10	●	●	●
	1	89	22	45	9.0	3	7.1	10	○	○	○

○ need to produce

● in stock

材料	HB	N/mm2	延伸性 %	材料示例	Vc (m/min)			
1.0 钢								
1.1 铁磁性低碳钢	<200	>200 <400	10	RFe100	8	8	10	15
1.2 易削钢、结构钢	<200	>350 <700	30	C10, C15, ST37, ST52	8	8	10	15
1.3 普通碳钢	<300	>350 <850	20	C45, C92D, D95-S	10	10	11	12
1.4 合金钢	<250	>500 <850	30	41CrMo4,	4	4	8	
1.5 合金钢 - 淬火及回火	<350	>850 <1200	30	36CrNiMo4,				
1.6 预硬钢、淬火钢	<420	>1500	12	X155CrVMo12- 1,				
1.7 淬火钢 45-50 Rc	<550		<12	90MnV8				
1.8 淬火钢 50-62 Rc	<700		<12	HS2-10-1-8				
2.0 不锈钢								
2.1 易切削	<250	<850	25	X8CrNiS18-9	5	5	5	12
2.2 奥氏体	<250	<850	20	X5CrNi18-10	3	3	3	10
2.3 铁素体 + 马氏体	<250	<850	20	X20Cr13	3	3	2	
3.0 铸铁								
3.1 灰铸铁 (软质)	<150	<500	10	GG10, GG40	10	10	15	
3.2 灰铸铁 (硬质)	<300	<1000	10	GGG40,	8	8	10	
3.3 球墨铸铁、可锻铸铁	<200	<700	10	GGG80	8	8	10	
4.0 钛								
4.1 纯钛	<250	<850	20	Ti99.7, Ti99.8				
4.2 钛合金	>250	>850	20	TiCu2, TiAl6V4				
5.0 镍								
5.1 镍合金	<250	<850	25	Ni38, Ni54,				
5.2 镍合金	>250	>850	25	NiCr16FeTi				
6.0 铜								
6.1 紫铜	<120	<400	12	SF-Cu	5	5	8	25
6.2 短屑黄铜、磷铜、青铜	<200	<700	12	G-CuSn12Ni	8	8	12	
6.3 长屑黄铜、青铜	<200	<700	12	G-CuPb20Sn	10	10	15	10
7.0 铝								
7.1 纯铝	<100	<350	15	Al99.5	15	15	18	30
7.2 纯镁	<150	<350	15	Al99.85Mg0.5	15	15	18	30
7.3 铝合金, 合硅量 < 1.5 %	<120	<500	15	AlMg1.5	15	15	18	25
7.4 铝合金, 合硅量 > 1.5% < 10%	<120	<400	10	AlSi10Mg	10	10	15	15
7.5 铝合金, 合硅量 > 10%	-	<400	N	AlSi17Cu4				
7.6 镁合金	-	<400	N	MgAl3Zn				
8.0 塑料								
8.1 塑料、聚乙烯	<340	<50	N	丙烯腈-丁二烯- 苯乙烯 (ABS)	20	20	20	

攻牙注意事项

- 以上列出的速度仅作为建议, 该速度根据所列螺纹深度得出, 并可根据使用情况来调节速度。通常来说:
 - 如果所需孔深小于上面列出的深度 = 增加速度
 - 如果所需孔深大于上面列出的深度 = 降低速度
- 使用带方形的夹头来夹持丝锥, 以防止滑动, 例如: ER-GB 夹头
- 使用伸缩浮动攻牙头时, 螺旋槽丝锥的进给速度应下调至正常的 95%, 以防止内

公式

$$n = (vc \times 1000) / (\phi \times \pi)$$

$$vc = (\phi \times \pi \times n) / 1000$$

$$vf = f \times n$$

说明

n = 每分钟转数
vc = 切削速度 (米/分钟)
f = 进给量 (毫米/转)
vf = 进给速度 (毫米/分钟)

丝攻的材质 Materials Of Taps

在攻牙作业以手动攻牙与低速攻牙为主流的时代，丝攻的材质多为合金工具钢(SKS)：随着作业的高效率化，高速加工化，以及难加工材料的增加，丝攻所使用的材料也逐渐高级化，如今高速度工具钢成为主流，粉末高速钢(HSS)与硬制合金的使用逐等增加。下表中，显示了高速钢工具规格与丝攻刻印记号的关系。现在高V高速钢，Co高速钢成为主流，使用耐磨性，耐热性高的优良材料。另外，使用在丝攻上的材质相同于或相当于JIS规格。

When LOW speed tapping and hand finishing were mainstream, alloy tool steel(SKS) was used. However, with the increase in tapping speed and efficiency, and wider use of difficult machine materials, higher grades of tap material were required. Today, powder metallurgy HSS and cemented carbide are preferred, with high speed tool steel as the mainstream. The table below shows the relations between the high-speed tool steel standard and tap marking symbols. The present mainstream is high V high-speed steel and Co high-speed steel, both of which show excellent wear and heat resistance. In addition, the materials used for taps are similar or equivalent to the JIS standard.

高速度工具钢 High speed tool steel

记号 Symbol		化学成分 Chemical compositions						丝攻刻印记号 Tap marking symbol	
JIS	AISI	C	Cr	Mo	W	V	Co	溶解高速钢 Dissolution HSS	粉末高速钢 Powder metallurgy HSS
SKH51	M2M3-1	0.80	4.0	5.0	6.0	2.0	-	-	-
SKH52	M3-1	1.05	4.0	5.0	6.0	2.4	-	HSSV	-
SKH53	M3-2	1.20	4.0	5.0	6.0	3.0	-	HSSE	-
SKH55	M35	0.80	4.0	5.0	6.0	2.0	5.0	HSSE	-
SKH56	M36	0.90	4.0	5.0	6.0	2.0	8.0	HSSE	-
SKH57	-	1.25	4.0	3.5	10.0	3.5	10.0	-	HSSP
SKH58	M7	1.00	4.0	8.8	1.8	2.0	-	-	-
SKH59	M42	1.10	3.8	9.5	1.5	1.2	8.0	HSSE	-
SKH10	T15	1.50	4.0		12.0	5.0	5.0		HSSP

硬质合金 Tungsten carbide

以WC·Co为主要成分的一般K型硬质合金，和高速度工具钢相抗析力低，韧性不足。容易因为切屑的原因发生刀刃缺损问题。因此，作为丝攻用硬质材料，使用韧性较高的在JIS大分类中属于Z种系统的超微粒子硬质合金。

The main components of general tungsten carbide K type are WC and Co, which is less effective than high speed tool steel. It lacks durability and is prone to chipping problems. Instead, ultra-fine grain alloy (JIS major category Z type) is used, as it enhances the durability of the tungsten carbide material used for taps.

丝攻的表面处理 Surface treatment of taps

攻牙加工是在下孔内部狭窄范围内进行的加工，难以使用切削油进行冷却和润滑，切削和摩擦产生的热容易导致磨损与溶着的发生。而且，在进行铁系材料的加工时，被加工材料与丝攻材料之间具有亲和性，容易发生粘屑现象。为了解决这些问题，需要进行各种表面处理。

Tapping is limited for processing inside a hole. Since cooling and lubrication with cutting fluids are not easy, and both cutting heat and frictional heat are generated, wear and galling are likely to occur. In addition, processing steel materials may result in affinity with tap materials. So that galling is easy to occur. Various kinds of surface treatment are available to address these problems.

种类 Types	效果 Effects	颜色 Shade	涂层厚度 Thickness	摩擦系数 Coefficient Of friction	最高加工温度 Maximum temperature used	硬度 Hardness
氧化处理 Steam oxide treatment	多孔性氧化皮膜可以防止溶着的发生 Prevention of galling by means of porous oxide film	黑色 Black	1~3	—	—	基底材料硬度 Hardness of base material HV 850
氮化处理 Nitride treatment	利用扩散氧化层提高耐磨耗性与耐溶着性 Improved wear resistance and galling—proofness by means of diffusing layer of nitride	灰色 Gray	10~30	—	—	HV 1000~1300
TiN	提高耐磨耗性与耐溶着性 Improved wear resistance and galling—proofness	金色 Gold	1~5	0.4	600℃	HV 2300
TiCN	提高耐磨耗性与耐溶着性 Improved wear resistance and galling—proofness		1~5	0.4	400℃	HV 3000
C	提高耐磨耗性，耐热性以及耐溶着性 Improved wear resistance, heat resistance and galling—proofness	金色 Gold	2~5	0.4	600℃	HV 3000
CrN	提高耐溶着性与耐热性 Improved heat resistance and galling—proofness	银灰色 Silver gray	2~5	0.5	700℃	HV 1750
TiAlN	提高耐热性，耐磨耗性以及耐溶着性 Improved wear resistance, heat resistance and galling—proofness	紫灰色 Purple gray	2~5	0.3	800℃	HV 3500
DLC	提高耐磨耗性与耐溶着性 Improved wear resistance and galling—proofness	黑色 Black	1~4	0.1~0.2	400℃	HV 3000~5000

挤压丝锥的下孔径表

Drill Hole for Forming Taps(TAFLET)

米制螺纹的下孔径与挤压丝攻的精度号
Hole sizes for metric threads and tap limit of TAFLET

基本尺寸 Nominal size	螺距 Pitch	各切合率对应的下孔径 (mm) Percentage of thread engagement hole diameter(mm)			
		100%	90%	80%	70%
M1	0.25	0.86	0.87	0.89	0.90
	0.2	0.89	0.90	0.91	0.92
M1.1	0.25	0.96	0.97	0.99	1.00
	0.2	0.99	1.00	1.01	1.02
M1.2	0.25	1.06	1.07	1.09	1.10
	0.2	1.09	1.10	1.11	1.12
M1.4	0.3	1.23	1.25	1.26	1.28
	0.2	1.29	1.30	1.31	1.32
M1.6	0.35	1.40	1.42	1.44	1.46
	0.2	1.49	1.50	1.51	1.52
M1.7	0.35	1.50	1.52	1.54	1.56
	0.2	1.59	1.60	1.61	1.62
M1.8	0.35	1.60	1.62	1.64	1.66
	0.2	1.69	1.70	1.71	1.72
M2	0.4	1.77	1.80	1.82	1.84
	0.25	1.86	1.87	1.89	1.91
M2.2	0.45	1.94	1.97	2.00	2.02
	0.25	2.06	2.07	2.09	2.10
M2.3	0.4	2.07	2.10	2.12	2.14
	0.25	2.16	2.17	2.19	2.20
M2.5	0.45	2.24	2.27	2.30	2.32
	0.35	2.3	2.32	2.34	2.36
M2.6	0.45	2.34	2.37	2.40	2.42
	0.35	2.4	2.42	2.44	2.46
M3	0.6	2.66	2.69	2.73	2.76
	0.5	2.72	2.74	2.77	2.80
M3.5	0.35	2.80	2.82	2.84	2.86
	0.6	3.16	3.19	3.23	3.26
M4	0.75	3.57	3.62	3.66	3.70
	0.7	3.60	3.64	3.68	3.72
M4.5	0.5	3.72	3.74	3.77	3.80
	0.75	4.07	4.12	4.16	4.20
M5	0.9	4.49	4.54	4.59	4.64
	0.8	4.55	4.59	6.64	4.68
M5.5	0.5	4.72	4.74	4.77	4.80
	0.9	4.99	5.04	5.09	5.14
M6	1	5.22	5.24	5.27	5.30
	0.75	5.43	5.49	5.55	5.60
M7	1	5.57	5.62	5.66	5.70
	0.75	5.72	5.74	5.77	5.80
M8	1	6.43	6.49	6.55	6.60
	0.75	6.57	6.62	6.66	6.70
M9	1.25	6.72	6.74	6.77	6.80
	1	7.29	7.36	7.43	7.50
M10	1	7.43	7.49	7.55	7.60
	0.75	7.57	7.62	7.66	7.70
M11	1	7.72	7.74	7.77	7.80
	0.5	8.29	8.36	8.43	8.50
M12	1.25	8.43	8.49	8.55	8.60
	1	8.57	8.62	8.66	8.70
M13	0.75	8.72	8.74	8.77	8.80
	1.5	9.15	9.23	9.32	9.40
M14	1.25	9.29	9.36	9.43	9.50
	1	9.43	9.49	9.55	9.60
M15	0.75	9.57	9.62	9.66	9.70
	0.5	9.72	9.74	9.77	9.80
M16	1.5	10.15	10.23	10.32	10.40
	1	10.43	10.49	10.55	10.60
M17	0.75	10.57	10.62	10.66	10.70
	1.75	11.01	11.11	11.21	11.31
M18	1.5	11.15	11.23	11.32	11.40
	1.25	11.29	11.36	11.43	11.50
M19	1	11.43	11.49	11.55	11.60
	2	12.87	12.93	13.09	13.21
M20	1.5	13.15	13.23	13.32	13.40
	1.25	13.29	13.36	13.43	13.50
M21	1	13.43	13.49	13.55	13.60
	1.5	14.15	14.23	14.32	14.40
M22	1	14.43	14.49	14.55	14.60
	2	14.87	14.98	15.09	15.21
M23	1.5	15.15	15.23	15.32	15.40
	1	15.43	15.49	15.55	15.60
M24	1.5	16.15	16.23	16.32	16.40
	1	16.43	16.49	16.55	16.60
M25	2.5	16.58	16.72	16.87	17.01
	2	16.87	16.98	17.09	17.21
M26	1.5	17.15	17.23	17.32	17.40
	1	17.43	17.49	17.55	17.60
M27	2.5	18.58	18.72	18.87	19.01
	2	18.87	18.92	19.09	19.21
M28	1.5	19.15	19.23	19.32	19.40
	1	19.43	19.49	19.55	19.60
M29	2.5	20.58	20.72	20.87	21.01
	2	20.87	20.98	21.09	21.21
M30	1.5	21.15	21.23	21.32	21.40
	1	21.43	21.49	21.55	21.60
M31	2	22.87	22.98	23.09	23.21
	1.5	23.15	23.23	23.32	23.40
M32	1	23.43	23.49	23.55	23.60

基本尺寸 Nominal size	螺距 Pitch	各切合率对应的下孔径 (mm) Percentage of thread engagement hole diameter(mm)			
		100%	90%	80%	70%
M9	1.25	8.29	8.36	8.43	8.50
	1	8.43	8.49	8.55	8.60
M10	0.75	8.57	8.62	8.66	8.70
	0.5	8.72	8.74	8.77	8.80
M11	1.5	9.15	9.23	9.32	9.40
	1.25	9.29	9.36	9.43	9.50
M12	1	9.43	9.49	9.55	9.60
	0.75	9.57	9.62	9.66	9.70
M13	0.5	9.72	9.74	9.77	9.80
	1.5	10.15	10.23	10.32	10.40
M14	1	10.43	10.49	10.55	10.60
	0.75	10.57	10.62	10.66	10.70
M15	1.75	11.01	11.11	11.21	11.31
	1.5	11.15	11.23	11.32	11.40
M16	1.25	11.29	11.36	11.43	11.50
	1	11.43	11.49	11.55	11.60
M17	2	12.87	12.93	13.09	13.21
	1.5	13.15	13.23	13.32	13.40
M18	1.25	13.29	13.36	13.43	13.50
	1	13.43	13.49	13.55	13.60
M19	1.5	14.15	14.23	14.32	14.40
	1	14.43	14.49	14.55	14.60
M20	2	14.87	14.98	15.09	15.21
	1.5	15.15	15.23	15.32	15.40
M21	1	15.43	15.49	15.55	15.60
	1.5	16.15	16.23	16.32	16.40
M22	1	16.43	16.49	16.55	16.60
	2.5	16.58	16.72	16.87	17.01
M23	2	16.87	16.98	17.09	17.21
	1.5	17.15	17.23	17.32	17.40
M24	1	17.43	17.49	17.55	17.60
	2.5	18.58	18.72	18.87	19.01
M25	2	18.87	18.92	19.09	19.21
	1.5	19.15	19.23	19.32	19.40
M26	1	19.43	19.49	19.55	19.60
	2.5	20.58	20.72	20.87	21.01
M27	2	20.87	20.98	21.09	21.21
	1.5	21.15	21.23	21.32	21.40
M28	1	21.43	21.49	21.55	21.60
	2	22.87	22.98	23.09	23.21
M29	1.5	23.15	23.23	23.32	23.40
	1	23.43	23.49	23.55	23.60

[注]

- 1.请经过试加工决定下孔径尺寸：此表的尺寸为参考尺寸。
- 2.在以母螺纹公差80%为目标的条件下，决定了精度号。

Note :

1. Determine hole diameter by tapping test. The dimensions in this table are for reference only.
2. Tap limit is determined with 80% of the tolerance at the internal thread as an aim

切削丝锥的下孔径表

Hole Diameter of Cutting Taps

丝攻的下孔径，是在JIS B 1 004标准下，切合率的60%以上的条件下设定的，另外JIS B 2009标准下有其母螺纹内径尺寸的规定值，这个时候的切合率范围在80%~90%。如果切合率接近于100%，下孔径变小，因此有可能导致攻牙扭矩的增大和丝攻折损等问题的发生。在设定下孔的时候需要注意。

Hole diameters of threads are provided in JIS B 1 004 as 60% or more of percentage of thread engagement. However, in JIS B 2009 metric threads for general use—tolerance—are provided by the minor diameters of internal threads; in this case the percentage of thread engagement is within the range of 80—90%. If the percentage of thread engagement is close to 100%, the hole diameter becomes small, which lead to higher cutting torque and can cause tap breakage. Care is therefore needed when setting a hole.

切削丝攻下孔径的计算

下孔径Dk=母螺纹外径-(2XhX(切合率/100))

h: 切合高度(各螺纹的种类如下)

0.541 266 X螺距……米制M·微型螺纹U

0.6403 X螺距……惠式螺纹W

0.6495 X螺距……电缝衣机用螺纹SM

0.640327 X螺距……平行管用螺纹G(PF)

切合率的计算式

$$\text{切合率} = \frac{(\text{螺纹的外径} - \text{下孔直径})}{2 \times \text{切合高度}} \times 100(\%)$$

Formula for calculating hole diameters of cutting taps:

Hole dia. (Dk)=major dia. of external thread-(2 X h X(percentage of thread engagement / 100))

h: Height of thread engagement(types of each thread are as follows)

0.541 266 X pitch……metric M. unified U

0.6403 X pitch……Whitworth W

0.6495 X pitch……screw threads for sewing machine SM

0.640327 X pitch……parallel pipe threads G(PF)

Formula for calculating percentage of thread engagement

$$\text{Percentage of thread engagement} = \frac{(\text{major dia. of external thread} - \text{hole diameter})}{2 \times \text{height of thread engagement}} \times 100\%$$

一般用米制螺纹M用下孔径表

Hole size for general Metric threads

单位 (Unit):mm

基本尺寸 Nominal size	螺距 Pitch	各切合率对应的下孔径 (mm) Percentage of thread engagement hole diameter(mm)				母螺纹的内径尺寸 Minor dia of internal thread
		100%	90%	80%	70%	
M1	0.25	0.73	0.76	0.78	0.81	0.729 ~ 0.785
	0.2	0.78	0.81	0.83	0.85	0.783 ~ 0.821
M1.1	0.25	0.83	0.86	0.88	0.91	0.829 ~ 0.885
	0.2	0.88	0.91	0.93	0.95	0.883 ~ 0.921
M1.2	0.25	0.93	0.96	0.98	1.01	0.929 ~ 0.985
	0.2	0.98	1.01	1.03	1.05	0.983 ~ 1.021
M1.4	0.3	1.08	1.11	1.14	1.17	1.075 ~ 1.142
	0.2	1.18	1.21	1.23	1.25	1.183 ~ 1.221
M1.6	0.35	1.22	1.26	1.3	1.33	1.221 ~ 1.321
	0.2	1.38	1.41	1.43	1.45	1.383 ~ 1.421
M1.7	0.35	1.32	1.36	1.4	1.43	1.321 ~ 1.421
	0.2	1.48	1.51	1.53	1.55	1.483 ~ 1.521
M1.8	0.35	1.42	1.46	1.5	1.53	1.421 ~ 1.521
	0.2	1.58	1.61	1.63	1.65	1.583 ~ 1.621
M2	0.4	1.57	1.61	1.65	1.7	1.567 ~ 1.679
	0.25	1.73	1.76	1.78	1.81	1.729 ~ 1.785
M2.2	0.45	1.71	1.76	1.81	1.86	1.713 ~ 1.838
	0.25	1.93	1.96	1.98	2.01	1.929 ~ 1.985

单位 (Unit):mm

基本尺寸 Nominal size	螺距 Pitch	各切合率对应的下孔径 (mm) Percentage of thread engagement hole diameter(mm)				母螺纹的内径尺寸 Minor dia of internal thread
		100%	90%	80%	70%	
M2.3	0.4	1.87	1.91	1.95	2	1.867 ~ 1.979
	0.25	2.03	2.06	2.08	2.11	2.029 ~ 2.085
M2.5	0.45	2.01	2.06	2.11	2.16	2.013 ~ 2.138
	0.35	2.12	2.16	2.2	2.23	2.121 ~ 2.221
M2.6	0.45	2.11	2.16	2.21	2.26	2.113 ~ 2.238
	0.35	2.22	2.26	2.3	2.33	2.221 ~ 2.331
M3	0.6	2.35	2.42	2.48	2.55	2.350 ~ 2.540
	0.5	2.46	2.51	2.57	2.62	2.459 ~ 2.599
	0.35	2.62	2.66	2.7	2.73	2.621 ~ 2.721
M3.5	0.6	2.85	2.92	2.98	3.05	2.850 ~ 3.010
	0.35	3.12	3.16	3.2	3.23	3.121 ~ 3.221
M4	0.75	3.19	3.27	3.35	3.43	3.188 ~ 3.378
	0.7	3.24	3.32	3.39	3.47	3.242 ~ 3.422
	0.5	3.46	3.51	3.57	3.62	3.459 ~ 3.599
M4.5	0.75	3.69	3.77	3.85	3.93	3.688 ~ 3.878
	0.5	3.96	4.01	4.07	4.12	3.959 ~ 4.099
M5	0.9	4.03	4.12	4.22	4.32	4.026 ~ 4.266
	0.8	4.13	4.22	4.31	4.39	4.134 ~ 4.334
	0.5	4.46	4.51	4.57	4.62	4.459 ~ 4.599

挤压丝锥的下孔径表

Drill Hole for Forming Taps(TAFLET)

一般用米制螺纹M用下孔径表

Hole size for general Metric threads

单位(Unit):mm

基本尺寸 Nominal size	螺距 Pitch	各切合率对应的下孔径 (mm) Percentage of thread engagement hole diameter(mm)				母螺纹的内径尺寸 Minor dia of internal thread
		100%	90%	80%	70%	
M5.5	0.9	4.53	4.62	4.72	4.82	4.526 ~ 4.866
	0.5	4.96	4.01	5.07	5.12	4.959 ~ 5.099
M6	1	4.92	5.03	5.13	5.24	4.917 ~ 5.153
	0.75	5.19	5.27	5.35	5.43	5.188 ~ 5.378
M7	1	5.92	6.03	6.13	6.24	5.917 ~ 6.153
	0.75	6.19	6.27	6.35	6.43	6.188 ~ 6.378
M8	1.25	6.65	6.78	6.92	7.05	6.647 ~ 6.912
	1	6.92	7.03	7.13	7.24	6.917 ~ 7.153
M9	1.25	7.65	7.78	7.92	8.05	7.647 ~ 7.912
	1	7.92	8.03	8.13	8.24	7.917 ~ 8.153
M10	1.5	8.38	8.54	8.7	8.86	8.376 ~ 8.676
	1.25	8.65	8.78	8.92	9.05	8.647 ~ 8.912
M11	1.5	9.38	9.54	9.7	9.86	9.376 ~ 9.676
	1	9.92	10.3	10.13	10.24	9.917 ~ 10.153
M12	1.75	10.11	10.3	10.48	10.67	10.106 ~ 10.441
	1.5	10.38	10.54	10.7	10.86	10.376 ~ 10.676
M14	2	11.8	12.1	12.3	12.5	11.835 ~ 12.210
	1.5	12.38	12.54	12.7	12.86	12.376 ~ 12.676
M15	1.5	13.38	13.54	13.7	13.86	13.376 ~ 13.612
	1	13.92	14.03	14.13	14.24	13.917 ~ 14.153
M16	2	13.8	14.1	14.3	14.5	13.835 ~ 14.210
	1.5	14.38	14.54	14.7	14.86	14.376 ~ 14.676
M17	1.5	15.38	15.54	15.7	15.86	15.376 ~ 15.676
	1	15.92	16.03	16.13	16.24	15.917 ~ 16.153
M18	2.5	15.3	15.6	15.8	16.1	15.294 ~ 15.744
	2	15.8	16.1	16.3	16.5	15.835 ~ 16.210
M20	1.5	16.38	16.54	16.7	16.86	16.376 ~ 16.676
	1	16.92	17.03	17.13	17.24	16.917 ~ 17.153

基本尺寸 Nominal size	螺距 Pitch	各切合率对应的下孔径 (mm) Percentage of thread engagement hole diameter(mm)				母螺纹的内径尺寸 Minor dia of internal thread
		100%	90%	80%	70%	
M22	2.5	19.3	19.6	19.8	19.8	19.294 ~ 19.744
	2	19.8	20.1	20.3	20.3	19.835 ~ 20.210
M24	1.5	20.38	20.54	20.7	20.7	20.376 ~ 20.676
	1	20.92	21.03	21.13	21.13	20.917 ~ 21.153
M25	3	20.8	21.1	21.4	21.4	20.752 ~ 21.252
	2	21.8	22.1	22.3	22.3	21.835 ~ 22.210
M26	1.5	22.38	22.54	22.7	22.7	22.376 ~ 22.676
	1	22.92	23.03	23.13	23.13	22.917 ~ 23.153
M27	2	22.8	23.1	23.3	23.3	22.835 ~ 23.210
	1.5	23.38	23.54	23.7	23.7	23.376 ~ 23.676
M28	1	23.92	24.03	24.13	24.13	23.917 ~ 24.153
	1.5	24.38	24.54	24.7	24.7	24.376 ~ 24.676
M30	3	23.8	24.1	24.4	24.7	23.752 ~ 24.252
	2	24.8	25.1	25.3	25.5	24.835 ~ 25.210
M32	1.5	25.38	25.54	25.7	25.86	25.376 ~ 25.676
	1	25.92	26.03	26.13	26.24	25.917 ~ 26.153
M33	2	25.8	26.1	26.3	26.5	25.835 ~ 26.210
	1.5	26.38	26.54	26.7	26.86	26.376 ~ 26.676
M35	1	26.92	27.03	27.13	27.24	26.917 ~ 27.153
	3.5	26.2	26.6	27.0	27.4	26.211 ~ 26.771
M36	3	26.8	27.1	27.4	27.7	26.752 ~ 27.252
	2	27.8	28.1	28.3	28.5	27.835 ~ 28.210
M38	1.5	28.38	28.54	28.7	28.86	28.376 ~ 28.676
	1	28.92	29.03	29.13	29.24	28.917 ~ 29.153
M40	2	29.8	30.1	30.3	30.5	29.835 ~ 30.210
	1.5	30.38	30.54	30.7	30.86	30.376 ~ 30.676
M42	3.5	29.2	29.6	30.0	30.4	29.211 ~ 29.771
	3	29.8	30.1	30.4	30.7	29.752 ~ 30.252
M44	2	30.8	31.1	31.3	31.5	30.835 ~ 31.210
	1.5	31.38	31.54	31.7	31.86	31.376 ~ 31.676
M46	1.5	33.38	33.54	33.7	33.86	33.376 ~ 33.676
	4	31.7	32.1	32.5	33.0	31.670 ~ 32.270
M48	3	32.8	33.1	33.4	33.7	32.752 ~ 33.252
	2	33.8	34.1	34.3	34.5	33.835 ~ 34.210
M50	1.5	34.38	34.54	34.7	34.86	34.376 ~ 34.676
	1.5	36.38	36.54	36.7	36.86	36.376 ~ 36.676
M52	4	34.7	35.1	35.5	36.0	34.670 ~ 35.270
	3	35.8	36.1	36.4	36.7	35.752 ~ 36.252
M54	2	36.8	37.1	37.3	37.5	36.835 ~ 37.210
	1.5	37.38	37.54	37.7	37.86	37.376 ~ 37.676
M56	3	36.8	37.1		37.7	36.752 ~ 37.252
	2	37.8	38.1		38.5	37.835 ~ 38.210
M58	1.5	38.38	38.54		38.86	38.376 ~ 37.676
	4.5	37.1	37.6		38.6	37.129 ~ 37.799
M60	4	37.7	38.1		39.0	37.670 ~ 38.270
	3	38.8	39.1		39.7	38.752 ~ 39.252
M62	2	39.8	40.1		40.5	39.835 ~ 40.210
	1.5	40.38	40.54		40.86	40.376 ~ 40.676

切削丝锥的下孔径表

Hole Diameter of Cutting Taps

微型螺纹的下孔径与挤压丝攻的精度号

Hole sizes for metric threads and tap limit of TAFLET

基本尺寸 Nominalsize	各切合率对应的下孔径 (mm) Percentage of thread engagement hole diameter(mm)			
	100%	90%	80%	70%
No. 1-64UNC	1.63	1.65	1.67	1.70
No. 2-56	1.93	1.95	1.98	2.00
No. 3-48	2.21	2.24	2.27	2.30
No. 4-40UNC	2.49	2.52	2.56	2.59
No. 5-40	2.82	2.85	2.89	2.92
No. 6-32	3.05	3.10	3.14	3.19
No. 8-32UNC	3.72	3.76	3.81	3.85
No. 10-24	4.23	4.29	4.35	4.41
No. 12-24	4.89	4.95	5.01	5.07
1/4-20UNC	5.63	5.70	5.77	5.85
5/16-18	7.14	7.22	7.30	7.38
3/8-16	8.62	8.71	8.80	8.89
7/16-14UNC	10.08	10.19	10.29	10.39
1/2-13	11.59	11.70	11.81	11.92
9/16-12	13.09	13.21	13.33	13.45
5/8-11UNC	14.55	14.68	14.81	14.95
3/4-10	17.61	17.75	17.90	18.04

基本尺寸 Nominalsize	各切合率对应的下孔径 (mm) Percentage of thread engagement hole diameter(mm)			
	100%	90%	80%	70%
No. 0-80UNF	1.34	1.36	1.38	1.40
No. 1-72	1.65	1.67	1.69	1.71
No. 2-64	1.96	1.98	2.00	2.03
No. 3-56UNF	2.26	2.28	2.31	2.34
No. 4-48	2.54	2.57	2.60	2.63
No. 5-44	2.85	2.88	2.91	2.95
No. 6-40UNF	3.15	3.18	3.22	3.25
No. 8-36	3.77	3.81	3.85	3.89
No. 10-32	4.38	4.42	4.47	4.51
No. 12-28UNF	4.97	4.05	5.07	5.13
1/4-28	5.84	5.89	5.94	5.99
5/16-24	7.34	7.40	7.46	7.52
3/8-24UNF	8.92	8.98	9.04	9.10
7/16-20	10.39	10.46	10.54	10.61
1/2-20	11.98	12.05	12.12	12.20
9/16-18UNF	13.49	13.57	13.65	13.73
5/8-18	15.06	15.14	15.22	15.30
3/4-16	18.15	18.24	18.33	18.42
7/8-14	21.20	21.30	21.40	21.50

基本尺寸 Nominalsize	各切合率对应的下孔径 (mm) Percentage of thread engagement hole diameter(mm)			
	100%	90%	80%	70%
G(PF)1/8-28	9.17	9.22	9.28	9.33
1/4-19	12.33	12.41	12.49	12.58
3/8-19	15.83	15.92	16.00	16.08
1/2-19	19.83	19.94	20.06	20.17

缝纫机螺纹的下孔径与挤压丝攻精度号

Hole sizes for sewing machine threads and tap limit of taflet

基本尺寸 Nominalsize	螺距 Pitch	各切合率对应的下孔径 (mm) Percentage of thread engagement hole diameter(mm)			
		100%	90%	80%	70%
SM 3/32	56	-	2.10	2.13	2.17
SM 1/8	48	-	2.85	2.89	2.92
	44	-	2.82	2.86	2.90
	40	-	2.79	2.83	2.87
SM 9/64	40	-	3.18	3.23	3.27
SM 11/64	40	-	3.98	4.02	4.06
	32	-	3.88	3.93	3.99
SM 3/16	40	-	4.37	4.42	4.46
	32	-	4.28	4.33	4.38
	28	-	4.21	4.27	4.33
	24	-	4.11	4.19	4.26
SM 13/64	32	-	4.67	4.73	4.78
SM 7/32	32	-	5.07	5.12	5.18
SM 15/64	28	-	5.40	5.46	5.52
SM 1/4	40	-	5.96	6.00	6.05
	28	-	5.79	5.86	5.92
	24	-	5.70	5.77	5.85
SM 9/32	28	-	6.59	6.65	6.71
	20	-	6.37	6.45	6.54
SM 5/16	28	-	7.38	7.44	7.51
	24	-	7.29	7.36	7.43
	18	-	7.07	7.17	7.27
SM 11/32	28	-	8.18	8.24	8.30
SM 3/8	28	-	8.97	9.03	9.09
	18	-	8.66	8.75	8.85
SM 7/16	28	-	10.56	10.62	10.68
	16	-	10.14	10.25	10.36
SM 1/2	28	-	12.14	12.21	12.27
	20	-	11.92	12.01	12.10
	12	-	11.40	11.55	11.69
SM 9/16	20	-	13.51	13.60	13.68

基本尺寸 Nominalsize	各切合率对应的下孔径 (mm) Percentage of thread engagement hole diameter(mm)			
	100%	90%	80%	70%
W 1/16-60	-	1.35	1.38	1.40
3/32-48	-	2.09	2.12	2.15
1/8-40	-	2.82	2.86	2.90
W 5/32-32	-	3.53	3.58	3.62
3/16-24	-	4.17	4.24	4.30
7/32-24	-	4.97	5.03	5.10
W 1/4-20	-	5.64	5.72	5.80
5/16-18	-	7.15	7.24	7.33
3/8-16	-	8.64	8.74	8.84
W 1/16-14	-	10.10	10.21	10.33
1/2-12	-	11.52	11.65	11.78
9/16-12	-	13.11	13.24	13.37
W 5/8-11	-	14.59	14.73	14.87
3/4-10	-	17.63	17.79	17.95

[注]

1.请经过试加工决定下孔径尺寸：此表的尺寸为参考尺寸。

2.在母螺纹公差为80%为目标的条件下，决定了精度号。

Note :

1. Determine hole diameter by tapping test. The dimensions in this table are for reference only.

2. Tap limit is determined with 80% of the tolerance at the internal thread as an aim