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# 直柄麻花钻 (HSS/HSS-E) 001

## Parallel Shank Twist Drills (HSS/HSS-E) 001

- 直柄麻花钻的形式、尺寸和技术要求符合国际 ISO 标准和国家 GB 标准。

- The style, dimension and technical requirements of the parallel shank twist drills conform to international ISO and national GB standards.



轧制 (Rolling)

材料 (Material) : W6Mo5Cr4V2



涂层 (Coating)

材料 (Material) : W6Mo5Cr4V2Co TiN



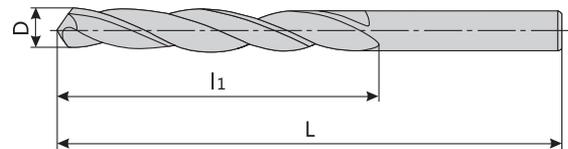
全磨制 (Grinding)

材料 (Material) : W6Mo5Cr4V2/HSS-E(含钴高速钢/Containing cobalt)



全磨制 (双后角) Grinding (Double Clearance Angle)

材料 (Material) : W6Mo5Cr4V2/HSS-E(含钴高速钢/Containing cobalt)



编号 (Item No.) : 001

单位 : mm

编号 (Item No.) : 001

单位 : mm

编号 (Item No.) : 001

单位 : mm

直径 Diameter	全长 Overall length	刃长 Length of flutes
D	L	l <sub>1</sub>
0.20	19	2.5
0.22	19	2.5
0.25	19	3
0.28	19	3
0.30	19	3
0.32	19	4
0.35	19	4
0.38	19	4
0.40	20	5
0.42	20	5
0.45	20	5
0.48	20	5
0.50	22	6
0.52	22	6
0.55	24	7
0.58	24	7
0.60	24	7
0.62	26	8
0.65	26	8
0.68	28	9
0.70	28	9
0.72	28	9

直径 Diameter	全长 Overall length	刃长 Length of flutes
D	L	l <sub>1</sub>
0.75	28	9
0.78	30	10
0.80	30	10
0.82	30	10
0.85	30	10
0.88	32	11
0.90	32	11
0.92	32	11
0.95	32	11
0.98	34	12
1.00	34	12
1.05	34	12
1.10	36	14
1.15	36	14
1.20	38	16
1.25	38	16
1.30	38	16
1.35	40	18
1.40	40	18
1.45	40	18
1.50	40	18
1.55	43	20

直径 Diameter	全长 Overall length	刃长 Length of flutes
D	L	l <sub>1</sub>
1.60	43	20
1.65	43	20
1.70	43	20
1.75	46	22
1.80	46	22
1.85	46	22
1.90	46	22
1.95	49	24
2.00	49	24
2.05	49	24
2.10	49	24
2.15	53	27
2.20	53	27
2.25	53	27
2.30	53	27
2.35	53	27
2.40	57	30
2.45	57	30
2.50	57	30
2.55	57	30
2.60	57	30
2.65	57	30



编号 (Item No.) : 001

单位 : mm

直径 Diameter D	全长 Overall length L	刃长 Length of flutes l <sub>1</sub>
2.70	61	33
2.75	61	33
2.80	61	33
2.85	61	33
2.90	61	33
2.95	61	33
3.00	61	33
3.10	65	36
3.20	65	36
3.30	65	36
3.40	70	39
3.50	70	39
3.60	70	39
3.70	70	39
3.80	75	43
3.90	75	43
4.00	75	43
4.10	75	43
4.20	75	43
4.30	80	47
4.40	80	47
4.50	80	47
4.60	80	47
4.70	80	47
4.80	86	52
4.90	86	52
5.00	86	52
5.10	86	52
5.20	86	52
5.30	86	52
5.40	93	57
5.50	93	57
5.60	93	57
5.70	93	57
5.80	93	57
5.90	93	57
6.00	93	57
6.10	101	63
6.20	101	63
6.30	101	63
6.40	101	63
6.50	101	63
6.60	101	63
6.70	101	63
6.80	109	69

编号 (Item No.) : 001

单位 : mm

直径 Diameter D	全长 Overall length L	刃长 Length of flutes l <sub>1</sub>
6.90	109	69
7.00	109	69
7.10	109	69
7.20	109	69
7.30	109	69
7.40	109	69
7.50	109	69
7.60	117	75
7.70	117	75
7.80	117	75
7.90	117	75
8.00	117	75
8.10	117	75
8.20	117	75
8.30	117	75
8.40	117	75
8.50	117	75
8.60	125	81
8.70	125	81
8.80	125	81
8.90	125	81
9.00	125	81
9.10	125	81
9.20	125	81
9.30	125	81
9.40	125	81
9.50	125	81
9.60	133	87
9.70	133	87
9.80	133	87
9.90	133	87
10.00	133	87
10.10	133	87
10.20	133	87
10.30	133	87
10.40	133	87
10.50	133	87
10.60	133	87
10.70	142	94
10.80	142	94
10.90	142	94
11.00	142	94
11.10	142	94
11.20	142	94
11.30	142	94

编号 (Item No.) : 001

单位 : mm

直径 Diameter D	全长 Overall length L	刃长 Length of flutes l <sub>1</sub>
11.40	142	94
11.50	142	94
11.60	142	94
11.70	142	94
11.80	142	94
11.90	151	101
12.00	151	101
12.10	151	101
12.20	151	101
12.30	151	101
12.40	151	101
12.50	151	101
12.60	151	101
12.70	151	101
12.80	151	101
12.90	151	101
13.00	151	101
13.10	151	101
13.20	151	101
13.30	160	108
13.40	160	108
13.50	160	108
13.60	160	108
13.70	160	108
13.80	160	108
13.90	160	108
14.00	160	108
14.25	169	114
14.50	169	114
14.75	169	114
15.00	169	114
15.25	178	120
15.50	178	120
15.75	178	120
16.00	178	120
16.50	184	125
17.00	184	125
17.50	191	130
18.00	191	130
18.50	198	135
19.00	198	135
19.50	205	140
20.00	205	140

订货说明 : 按产品编号、规格、材料、涂层 / 不涂层订货。例 : D=10 标记为 001-10-HSS-E- 不涂层。

Order Description: Please mark item No., specification, material, coating/no coating.

Example: for D=10 ,marker for 001-10-HSS-E-no coating.

注 : 1.HSS-E 表示含钴高速钢 2. 全磨制指直径尺寸 ≤ 20 的规格 3. 全磨制钻头开双后角时, 需注明双后角。

Note: 1.HSS-E said containing cobalt high speed steel.

2.All the grinding size refers to the engineering of the specifications of the 20 or less.

3.Specify double clearance angle when full ground drill has double clearance angle.

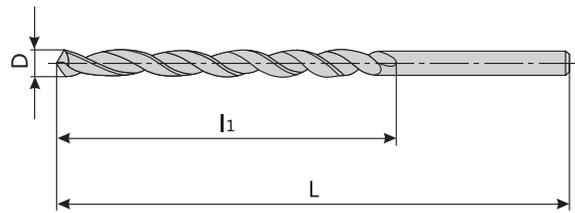


# 直柄长麻花钻 (HSS) 004

## Long Parallel Shank Twist Drills (HSS) 004

- 直柄长麻花钻的形式、尺寸符合国家 GB 标准。

- The style and dimension of the long parallel shank twist drills conform to national GB standards.



编号 (Item No.) : 004

单位 : mm

直径 Diameter	全长 Overall length	刃长 Length of flutes
D	L	l <sub>1</sub>
1.00	56	33
1.10	60	37
1.20	65	41
1.30	65	41
1.40	70	45
1.50	70	45
1.60	76	50
1.70	76	50
1.80	80	53
1.90	80	53
2.00	85	56
2.10	85	56
2.20	90	59
2.30	90	59
2.40	95	62
2.50	95	62
2.60	95	62
2.70	100	66
2.80	100	66
2.90	100	66
3.00	100	66
3.10	106	69
3.20	106	69
3.30	106	69
3.40	112	73
3.50	112	73
3.60	112	73
3.70	112	73
3.80	119	78
3.90	119	78

编号 (Item No.) : 004

单位 : mm

直径 Diameter	全长 Overall length	刃长 Length of flutes
D	L	l <sub>1</sub>
4.00	119	78
4.10	119	78
4.20	119	78
4.30	126	82
4.40	126	82
4.50	126	82
4.60	126	82
4.70	126	82
4.80	132	87
4.90	132	87
5.00	132	87
5.10	132	87
5.20	132	87
5.30	132	87
5.40	139	91
5.50	139	91
5.60	139	91
5.70	139	91
5.80	139	91
5.90	139	91
6.00	139	91
6.10	148	97
6.20	148	97
6.30	148	97
6.40	148	97
6.50	148	97
6.60	148	97
6.70	148	97
6.80	156	102
6.90	156	102



编号 ( Item No. ) : 004

单位 : mm

直径 Diameter	全长 Overall length	刃长 Length of flutes
D	L	l <sub>1</sub>
7.00	156	102
7.10	156	102
7.20	156	102
7.30	156	102
7.40	156	102
7.50	156	102
7.60	165	109
7.70	165	109
7.80	165	109
7.90	165	109
8.00	165	109
8.10	165	109
8.20	165	109
8.30	165	109
8.40	165	109
8.50	165	109
8.60	175	115
8.70	175	115
8.80	175	115
8.90	175	115
9.00	175	115
9.10	175	115
9.20	175	115
9.30	175	115
9.40	175	115
9.50	175	115
9.60	184	121
9.70	184	121
9.80	184	121
9.90	184	121
10.00	184	121

编号 ( Item No. ) : 004

单位 : mm

直径 Diameter	全长 Overall length	刃长 Length of flutes
D	L	l <sub>1</sub>
10.10	184	121
10.20	184	121
10.30	184	121
10.40	184	121
10.50	184	121
10.60	184	121
10.70	195	128
10.80	195	128
10.90	195	128
11.00	195	128
11.10	195	128
11.20	195	128
11.30	195	128
11.40	195	128
11.50	195	128
11.60	195	128
11.70	195	128
11.80	195	128
11.90	205	134
12.00	205	134
12.10	205	134
12.20	205	134
12.30	205	134
12.40	205	134
12.50	205	134
12.60	205	134
12.70	205	134
12.80	205	134
12.90	205	134
13.00	205	134

订货说明 : 按产品编号、规格订货。

例 :  $\phi 8.2$  标记为 004-8.2。

Order Description: Please mark item No. and specification for order.

Example: for  $\phi 8.2$ , marker with 004-8.2.



# 锥柄麻花钻 (HSS) 008-01

## Taper Shank Twist Drills (HSS) 008-01

- 锥柄麻花钻的形式、尺寸和技术要求符合国际 ISO 标准和国家 GB 标准。

- The style, dimension and technical requirements of the taper shank twist drills conform to international ISO and national GB standards.



轧制 (Rolling)

材料 (Material) : W9Mo3Cr4V



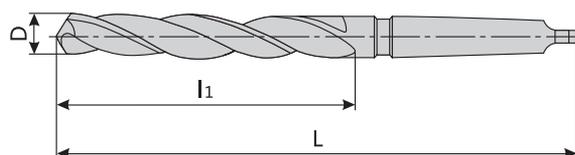
涂层 (Coating)

材料 (Material) : W6Mo5Cr4V2Co TiCN



磨制 (Grinding)

材料 (Material) : W9Mo3Cr4V (可涂层 /Coating option)



编号 (Item No.) : 008-01

单位 : mm

编号 (Item No.) : 008-01

单位 : mm

编号 (Item No.) : 008-01

单位 : mm

直径 Diameter	全长 Overall length	刃长 Length of flutes	莫氏锥柄 Morse taper shank
D	L	l <sub>1</sub>	
3.00	114	33	1
3.20	117	36	1
3.50	120	39	1
3.80	124	43	1
4.00	124	43	1
4.20	124	43	1
4.50	128	47	1
4.80	133	52	1
5.00	133	52	1
5.20	133	52	1
5.50	138	57	1
5.80	138	57	1
6.00	138	57	1
6.20	144	63	1
6.50	144	63	1
6.80	150	69	1
7.00	150	69	1
7.20	150	69	1
7.50	150	69	1
7.80	156	75	1
8.00	156	75	1
8.20	156	75	1

直径 Diameter	全长 Overall length	刃长 Length of flutes	莫氏锥柄 Morse taper shank
D	L	l <sub>1</sub>	
8.50	156	75	1
8.80	162	81	1
9.00	162	81	1
9.20	162	81	1
9.50	162	81	1
9.80	168	87	1
10.00	168	87	1
10.20	168	87	1
10.50	168	87	1
10.80	175	94	1
11.00	175	94	1
11.20	175	94	1
11.50	175	94	1
11.80	175	94	1
12.00	182	101	1
12.20	182	101	1
12.50	182	101	1
12.80	182	101	1
13.00	182	101	1
13.20	182	101	1
13.50	189	108	1
13.80	189	108	1

直径 Diameter	全长 Overall length	刃长 Length of flutes	莫氏锥柄 Morse taper shank
D	L	l <sub>1</sub>	
14.00	189	108	1
14.25	212	114	2
14.50	212	114	2
14.75	212	114	2
15.00	212	114	2
15.25	218	120	2
15.40	218	120	2
15.50	218	120	2
15.75	218	120	2
16.00	218	120	2
16.25	223	125	2
16.50	223	125	2
16.75	223	125	2
17.00	223	125	2
17.25	228	130	2
17.50	228	130	2
17.75	228	130	2
18.00	228	130	2
18.25	233	135	2
18.50	233	135	2
18.75	233	135	2
19.00	233	135	2



编号 (Item No.) : 008-01 单位 : mm

直径 Diameter	全长 Overall length	刃长 Length of flutes	莫氏锥柄 Morse taper shank
D	L	l <sub>1</sub>	
19.25	238	140	2
19.50	238	140	2
19.75	238	140	2
20.00	238	140	2
20.25	243	145	2
20.50	243	145	2
20.75	243	145	2
21.00	243	145	2
21.25	248	150	2
21.50	248	150	2
21.75	248	150	2
22.00	248	150	2
22.25	248	150	2
22.50	253	155	2
22.75	253	155	2
23.00	253	155	2
23.25	276	155	3
23.50	276	155	3
23.75	281	160	3
24.00	281	160	3
24.25	281	160	3
24.50	281	160	3
24.75	281	160	3
25.00	281	160	3
25.25	286	165	3
25.50	286	165	3
25.75	286	165	3
26.00	286	165	3
26.25	286	165	3
26.50	286	165	3
26.75	291	170	3
27.00	291	170	3
27.25	291	170	3
27.50	291	170	3
27.75	291	170	3
28.00	291	170	3
28.25	296	175	3
28.50	296	175	3
28.75	296	175	3
29.00	296	175	3
29.25	296	175	3
29.50	296	175	3
29.75	296	175	3
30.00	296	175	3
30.25	301	180	3
30.50	301	180	3
30.75	301	180	3

编号 (Item No.) : 008-01 单位 : mm

直径 Diameter	全长 Overall length	刃长 Length of flutes	莫氏锥柄 Morse taper shank
D	L	l <sub>1</sub>	
31.00	301	180	3
31.25	301	180	3
31.50	301	180	3
31.75	306	185	3
32.00	334	185	4
32.50	334	185	4
33.00	334	185	4
33.50	334	185	4
34.00	339	190	4
34.50	339	190	4
35.00	339	190	4
35.50	339	190	4
36.00	344	195	4
36.50	344	195	4
37.00	344	195	4
37.50	344	195	4
38.00	349	200	4
38.50	349	200	4
39.00	349	200	4
39.50	349	200	4
40.00	349	200	4
40.50	354	205	4
41.00	354	205	4
41.50	354	205	4
42.00	354	205	4
42.50	354	205	4
43.00	359	210	4
43.50	359	210	4
44.00	359	210	4
44.50	359	210	4
45.00	359	210	4
45.50	364	215	4
46.00	364	215	4
46.50	364	215	4
47.00	364	215	4
47.50	364	215	4
48.00	369	220	4
48.50	369	220	4
49.00	369	220	4
49.50	369	220	4
50.00	369	220	4
50.50	374	225	4
51.00	412	225	5
52.00	412	225	5
53.00	412	225	5
54.00	417	230	5
55.00	417	230	5

编号 (Item No.) : 008-01 单位 : mm

直径 Diameter	全长 Overall length	刃长 Length of flutes	莫氏锥柄 Morse taper shank
D	L	l <sub>1</sub>	
56.00	417	230	5
57.00	422	235	5
58.00	422	235	5
59.00	422	235	5
60.00	422	235	5
61.00	427	240	5
62.00	427	240	5
63.00	427	240	5
64.00	432	245	5
65.00	432	245	5
66.00	432	245	5
67.00	432	245	5
68.00	437	250	5
69.00	437	250	5
70.00	437	250	5
71.00	437	250	5
72.00	442	255	5
73.00	442	255	5
74.00	442	255	5
75.00	442	255	5
76.00	447	260	5
77.00	514	260	6
78.00	514	260	6
79.00	514	260	6
80.00	514	260	6
81.00	519	265	6
82.00	519	265	6
83.00	519	265	6
84.00	519	265	6
85.00	519	265	6
86.00	524	270	6
87.00	524	270	6
88.00	524	270	6
89.00	524	270	6
90.00	524	270	6
91.00	529	275	6
92.00	529	275	6
93.00	529	275	6
94.00	529	275	6
95.00	529	275	6
96.00	534	280	6
97.00	534	280	6
98.00	534	280	6
99.00	534	280	6
100.00	534	280	6

订货说明 : 按产品编号、规格、涂层 / 不涂层订货。例 :  $\phi 14$  标记为 008-01-14- 不涂层。

Order Description: Please mark item No. and specification for order. Example: for  $\phi 14$ , marker with 008-01-14.

注 : 磨制钻规格小于  $\phi 20$ 。 Note: Ground bit size less than  $\phi 20$ .



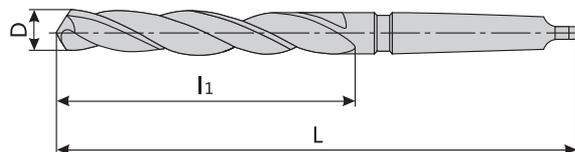


# 锥柄加长麻花钻 (HSS) 008-02

## Lengthened Taper Shank Twist Drills (HSS) 008-02

- 锥柄加长麻花钻的形式、尺寸符合国家 GB 标准。

- The style and dimension of the lengthened taper shank twist drills conform to national GB standards.



编号 (Item No.) : 008-02

单位 : mm

直径 Diameter	全长 Overall length	刃长 Length of flutes	莫氏锥柄 Morse taper shank
D	L	l <sub>1</sub>	
6.00	225	145	1
6.20	230	150	1
6.50	230	150	1
6.80	235	155	1
7.00	235	155	1
7.20	235	155	1
7.50	235	155	1
7.80	240	160	1
8.00	240	160	1
8.20	240	160	1
8.50	240	160	1
8.80	245	170	1
9.00	245	170	1
9.20	245	170	1
9.50	245	170	1
9.80	250	170	1
10.00	250	170	1
10.20	250	170	1
10.50	250	170	1
10.80	255	175	1
11.00	255	175	1
11.20	255	175	1
11.50	255	175	1
11.80	252	175	1

编号 (Item No.) : 008-02

单位 : mm

直径 Diameter	全长 Overall length	刃长 Length of flutes	莫氏锥柄 Morse taper shank
D	L	l <sub>1</sub>	
12.00	260	180	1
12.20	260	180	1
12.50	260	180	1
12.80	260	180	1
13.00	260	180	1
13.20	260	180	1
13.50	265	185	1
13.80	265	185	1
14.00	265	185	1
14.25	290	190	2
14.50	290	190	2
14.75	290	190	2
15.00	290	190	2
15.25	295	195	2
15.40	295	195	2
15.50	295	195	2
15.75	295	195	2
16.00	295	195	2
16.25	300	200	2
16.50	300	200	2
16.75	300	200	2
17.00	300	200	2
17.25	305	205	2
17.50	305	205	2

编号 (Item No.) : 008-02

单位 : mm

直径 Diameter	全长 Overall length	刃长 Length of flutes	莫氏锥柄 Morse taper shank
D	L	l <sub>1</sub>	
17.75	305	205	2
18.00	305	205	2
18.25	310	210	2
18.50	310	210	2
18.75	310	210	2
19.00	310	210	2
19.25	320	220	2
19.50	320	220	2
19.75	320	220	2
20.00	320	220	2
20.25	330	230	2
20.50	330	230	2
20.75	330	230	2
21.00	330	230	2
21.25	335	235	2
21.50	335	235	2
21.75	335	235	2
22.00	335	235	2
22.25	335	235	2
22.50	340	240	2
22.75	340	240	2
23.00	340	240	2

订货说明 : 按产品编号、规格订货。例 : φ20 标记为 008-02-20。

Order Description: Please mark item No. and specification for order.

Example: for φ 20 ,marker with 008-02-20.

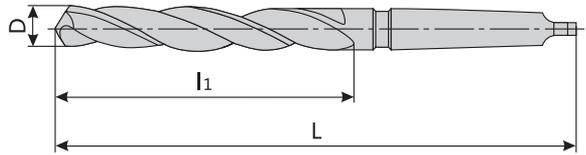


# 锥柄超长麻花钻 (HSS) 008-03

## Extra Long Taper Shank Twist Drills 008-03

- 锥柄超长麻花钻形式符合国家 GB 标准。

- Extra Long Taper Shank Twist Drills conform to GB standard.



编号 (Item No.) : 008-03

单位 : mm

直径 Diameter	全长 Overall length	刃长 Length of flutes	莫氏锥柄 Morse taper shank
D	L	l <sub>1</sub>	
6.00	200	110	1
6.00	250	160	1
6.00	315	225	1
6.50	200	110	1
6.50	250	160	1
6.50	315	225	1
7.00	200	110	1
7.00	250	160	1
7.00	315	225	1
7.50	200	110	1
7.50	250	160	1
7.50	315	225	1
8.00	200	110	1
8.00	250	160	1
8.00	315	225	1
8.50	200	110	1
8.50	250	160	1
8.50	315	225	1
9.00	200	110	1
9.00	250	160	1
9.00	315	225	1
9.50	200	110	1
9.50	250	160	1
9.50	315	225	1
10.00	250	160	1
10.00	315	225	1
10.00	400	310	1
11.00	250	160	1
11.00	315	225	1

编号 (Item No.) : 008-03

单位 : mm

直径 Diameter	全长 Overall length	刃长 Length of flutes	莫氏锥柄 Morse taper shank
D	L	l <sub>1</sub>	
11.00	400	310	1
12.00	250	160	1
12.00	315	225	1
12.00	400	310	1
13.00	250	160	1
13.00	315	225	1
13.00	400	310	1
14.00	250	160	1
14.00	315	225	1
14.00	400	310	1
15.00	315	215	2
15.00	400	300	2
15.00	500	400	2
16.00	315	215	2
16.00	400	300	2
16.00	500	400	2
17.00	315	215	2
17.00	400	300	2
17.00	500	400	2
18.00	315	215	2
18.00	400	300	2
18.00	500	400	2
19.00	315	215	2
19.00	400	300	2
19.00	500	400	2
20.00	315	215	2
20.00	400	300	2
20.00	500	400	2
21.00	315	215	2



编号 ( Item No. ) : 008-03

单位 : mm

直径 Diameter	全长 Overall length	刃长 Length of flutes	莫氏锥柄 Morse taper shank
D	L	l <sub>1</sub>	
21.00	400	300	2
21.00	500	400	2
22.00	315	215	2
22.00	400	300	2
22.00	500	400	2
23.00	315	215	2
23.00	400	300	2
23.00	500	400	2
24.00	400	275	3
24.00	500	375	3
24.00	630	505	3
25.00	400	275	3
25.00	500	375	3
25.00	630	505	3
28.00	400	275	3
28.00	500	375	3
28.00	630	505	3
30.00	400	275	3
30.00	500	375	3
30.00	630	505	3

编号 ( Item No. ) : 008-03

单位 : mm

直径 Diameter	全长 Overall length	刃长 Length of flutes	莫氏锥柄 Morse taper shank
D	L	l <sub>1</sub>	
32.00	400	250	4
32.00	500	350	4
32.00	630	480	4
35.00	400	250	4
35.00	500	350	4
35.00	630	480	4
38.00	400	250	4
38.00	500	350	4
38.00	630	480	4
40.00	400	250	4
40.00	500	350	4
40.00	630	480	4
42.00	500	350	4
42.00	630	480	4
45.00	500	350	4
45.00	630	480	4
48.00	500	350	4
48.00	630	480	4
50.00	500	350	4
50.00	630	480	4

订货说明 : 按产品编号、规格订货。

例 :  $\phi 20$  标记为 008-03-20。

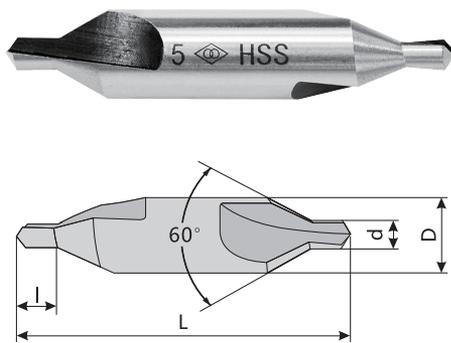
Order Description: Please mark item No. and specification for order.

Example: for  $\phi 20$ , marker with 008-03-20.



## 不带护锥中心钻 -A 型 (HSS) 020 Center Drills Without Protective Taper-Type A (HSS) 020

- 不带护锥中心钻的形式、尺寸和技术要求符合国际 ISO 标准和国家 GB 标准。
- The style, dimension and technical requirements of the center drills without protective taper conform to international ISO and national GB standards.



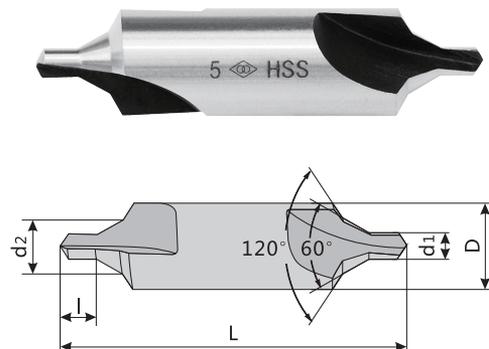
编号 (Item No.) : 020

单位 : mm

直径 Diameter	柄径 Shank Diameter	全长 Overall length	刃长 Length of flutes
d	D	L	l
1.0	3.15	31.5	1.3
1.25	3.15	31.5	1.6
1.6	4	35.5	2.0
2.0	5	40	2.5
2.5	6.3	45	3.1
3.0	8	50	3.9
3.15	8	50	3.9
4.0	10	56	5.0
5.0	12.5	63	6.3
6.0	16	71	8.0
6.3	16	71	8.0

## 带护锥中心钻 -B 型 (HSS) 021 Center Drills With Protective Taper-Type B (HSS) 021

- 带护锥中心钻的形式、尺寸和技术要求符合国际 ISO 标准和国家 GB 标准。
- The style, dimension and technical requirements of the center drills with protective taper conform to international ISO and national GB standards.



编号 (Item No.) : 021

单位 : mm

直径 Diameter	护锥小径 Minor diameter of protective taper	柄径 Shank Diameter	全长 Overall length	刃长 Length of flutes
d1	d2	D	L	l
1.0	2.12	4	35.5	1.3
1.25	2.65	5	40	1.6
1.6	3.35	6.3	45	2.0
2.0	4.25	8	50	2.5
2.5	5.3	10	56	3.1
3.0	6.7	11.2	60	3.9
3.15	6.7	11.2	60	3.9
4.0	8.5	14	67	5.0
5.0	10.6	18	75	6.3
6.0	13.2	20	80	8.0
6.3	13.2	20	80	8.0

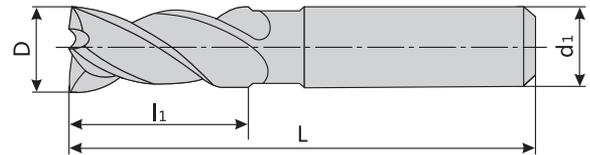


# 直柄立铣刀 (HSS) 101 102 103

## Parallel Shank End Mills (HSS) 101 102 103

- 直柄立铣刀的形式、尺寸和技术要求符合国际 ISO 标准和国家 GB 标准。

- The style, dimension and technical requirements of the parallel shank end mills conform to international ISO and national GB standards.



单位：mm

编号 Item No.	直径 Diameter	柄径 Shank Diameter	全长 Overall length	刃长 Length of flutes	齿数 No. of Teeth		
	D	d1	L	l1	粗齿 Coarse	中齿 Medium	细齿 Fine
粗齿 Coarse 101	3	3	40	8	3	4	
	4	4	43	11	3	4	
	5	5	47	13	3	4	
	6	6	57	13	3	4	
	7	8	60	16	3	4	5
中齿 Medium 102	8	8	63	19	3	4	5
	9	10	69	19	3	4	5
	10	10	72	22	3	4	5
细齿 Fine 103	11	12	79	22	3	4	6
	12	12	83	26	3	4	6
	14	12	83	26	3	4	6
	16	16	92	32	3	4	6
	18	16	92	32	3	4	6
	20	20	104	38	3	4	6

订货说明：按产品编号、规格订货。例：φ6粗齿 标记为 101-6。

Order Description: Please mark item No. and specification for order.

Example: for φ 6 coarse teeth, marker with 101-6.

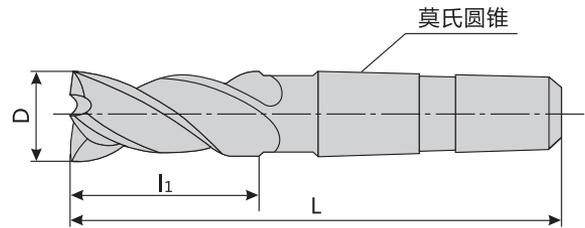


# 锥柄立铣刀 (HSS) 104 105 106

## Morse Taper Shank End Mills (HSS) 104 105 106

- 锥柄立铣刀的形式、尺寸和技术要求符合国际 ISO 标准和国家 GB 标准。

- The style, dimension and technical requirements of the morse taper shank end mills conform to international ISO and national GB standards.



单位 : mm

编号 Item No.	直径 Diameter	全长 Overall length	刃长 Length of flutes	莫氏锥柄 Morse taper shank	齿数 No. of Teeth		
	D	L	l <sub>1</sub>		粗齿 Coarse	中齿 Medium	细齿 Fine
粗齿 Coarse 104	12	96	26	1	3	4	5
	13	96	26	1	3	4	5
	14	111	26	2	3	4	5
	16	117	32	2	3	4	5
	18	117	32	2	3	4	6
	20	123	38	2	3	4	6
中齿 Medium 105	22	140	38	2	3	4	6
	24	147	45	3	3	4	6
	25	147	45	3	3	4	6
	26	147	45	3	3	4	6
细齿 Fine 106	28	147	45	3	3	4	6
	32	178	53	4	4	6	8
	36	178	53	4	4	6	8
	36	178	53	4	4	6	8
	40	188	63	4	4	6	8
	45	188	63	4	4	6	8
	50	200	75	4	4	6	8

订货说明：按产品编号、规格订货。例：φ14 粗齿 标记为 104-14。

Order Description: Please mark item No. and specification for order.

Example: for φ 14 coarse teeth, marker with 104-14.

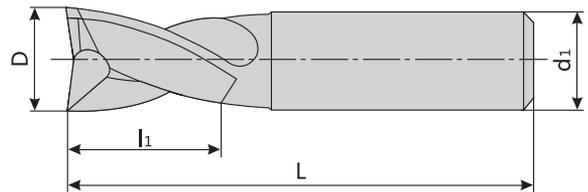


# 直柄键槽铣刀 (HSS) 124

## Keyseat Cutters With Parallel Shank (HSS) 124

- 直柄键槽铣刀的形式、尺寸符合企业标准。
- 直柄键槽铣刀直径公差分为 e8 , d8 两种。

- The style and dimension of the keyseat cutters with parallel shank conform to enterprise standards.
- The two kinds of diameter tolerance of the keyseat cutters with parallel shank are e8 and d8.



编号 ( Item No. ) : 124

单位 : mm

直径 Diameter	柄径 Shank Diameter	全长 Overall length	刃长 Length of flutes	公差 Tolerance
D	d <sub>1</sub>	L	l <sub>1</sub>	
2	2	40	8	e8 d8
3	3	40	8	
4	4	40	8	
5	5	40	8	
6	6	45	10	
8	8	50	14	
10	10	60	18	
12	12	65	22	
14	14	70	24	
16	16	75	28	
18	18	80	32	
20	20	85	36	

订货说明 : 按产品编号、规格和公差订货。例 : D=φ5 e8 公差 , 标记为 124-5-e8。

Order Description: Please mark item No. , specification and tolerance for order.

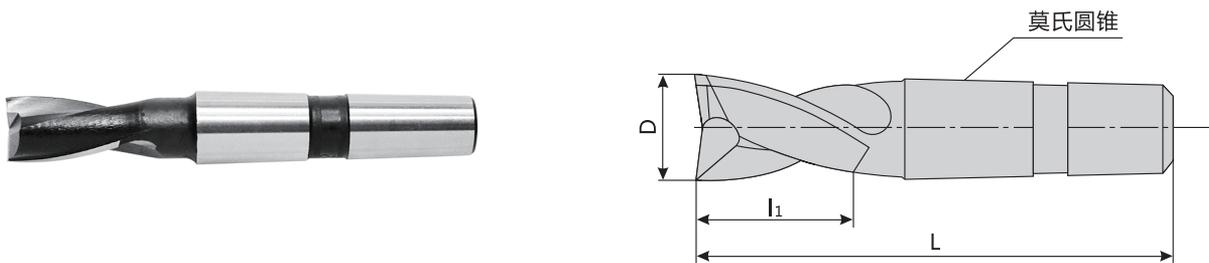
Example: for D= φ 5 e8 toleranc ,marker with 124-5-e8.



# 锥柄键槽铣刀 (HSS) 125

## Keyseat Cutters With Morse Taper Shank (HSS) 125

- 锥柄键槽铣刀的形式、尺寸符合企业标准。
- 锥柄键槽铣刀直径公差分为 e8 , d8 两种。
- The style and dimension of the keyseat cutters with morse taper shank conform to enterprise standards.
- The two kinds of diameter tolerance of the keyseat cutters with morse taper shank are e8 and d8.



编号 ( Item No. ) : 125

单位 : mm

直径 Diameter	全长 Overall length	刃长 Length of flutes	莫氏锥柄 Morse taper shank	公差 Tolerance
D	L	l <sub>1</sub>		
12	96	24	1	e8 d8
14	110	24	2	
16	115	28	2	
18	120	32	2	
20	125	36	2	
22	125	36	2	
25	145	40	3	
28	150	45	3	
32	155	50	3	
36	185	55	4	
40	190	60	4	
45	195	65	4	
50	195	65	4	

订货说明 : 按产品编号、规格和公差订货。例 : D=φ14 e8 公差 , 标记为 125-14-e8。

Order Description: Please mark item No. , specification and tolerance for order.

Example: for D= φ 14 e8 toleranc ,marker with 125-14-e8.



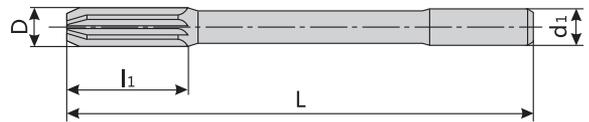


# 直柄机用铰刀 (HSS) 130

## Parallel Shank Machine Reamers (HSS) 130

- 直柄机用铰刀的形式、尺寸符合国家 GB 标准。
- 铰刀的精度等级有 H7、H8、H9。

- The style and dimension of the parallel shank machine reamers conform to national GB standards.
- The accuracy grades of the reamers are H7、H8、H9.



编号 (Item No.) : 130

单位 : mm

直径 Diameter	全长 Overall length	刃长 Length of flutes	柄径 Shank diameter
D	L	l <sub>1</sub>	d <sub>1</sub>
1.0	30	8	2
1.1	35	8	2
1.2	35	8	2
1.3	35	8	2
1.4	40	8	2
1.5	40	8	2
1.6	43	9	1.6
1.7	43	9	1.7
1.8	46	10	1.8
1.9	46	10	1.9
2.0	49	11	2.0
2.1	49	11	2.1
2.2	53	12	2.2
2.3	53	12	2.3
2.4	57	14	2.4
2.5	57	14	2.5
2.6	57	14	2.6

编号 (Item No.) : 130

单位 : mm

直径 Diameter	全长 Overall length	刃长 Length of flutes	柄径 Shank diameter
D	L	l <sub>1</sub>	d <sub>1</sub>
2.7	61	15	2.7
2.8	61	15	2.8
2.9	61	15	2.9
3.0	61	15	3.0
3.5	70	18	3.5
4.0	75	19	4.0
4.5	80	21	4.5
5.0	86	23	5.0
5.5	93	26	5.6
6.0	93	26	5.6
7.0	109	31	7.1
8.0	117	33	8.0
9.0	125	36	9.0
10.0	133	38	10.0
11.0	142	41	10.0
12.0	151	44	10.0

订货说明 : 按产品编号、规格和精度等级订货。例 : D=φ10H7 级 , 标记为 130-10-H7。

Order Description: Please mark item No. , specification and accuracy grade for order.

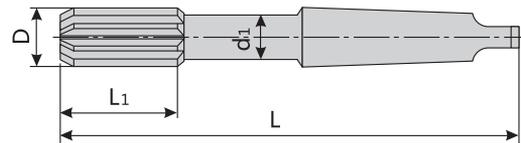
Example: for D= φ 10H7 ,marker with 130-10-H7.



# 锥柄机用铰刀 (HSS) 131

## Morse Taper Shank Machine Reamers (HSS) 131

- 锥柄机用铰刀的形式、尺寸符合国家 GB 标准。
- 铰刀的精度等级有 H7、H8、H9。
- The style and dimension of the morse taper shank machine reamers conform to national GB standards.
- The accuracy grades of the meamers are H7、 H8、 H9.



编号 (Item No.) : 131

单位 : mm

直径 Diameter	全长 Overall length	刃长 Length of flutes	柄径 Shank diameter
D	L	L <sub>1</sub>	d <sub>1</sub>
5.5	138	26	1
6	138	26	1
7	150	31	1
8	156	33	1
9	162	36	1
10	168	38	1
11	175	41	1
12	182	44	1
13	182	44	1
14	189	47	1
15	204	50	2
16	210	52	2
17	214	54	2
18	219	56	2
19	223	58	2
20	228	60	2
22	237	64	2
23	241	66	2

编号 (Item No.) : 131

单位 : mm

直径 Diameter	全长 Overall length	刃长 Length of flutes	柄径 Shank diameter
D	L	L <sub>1</sub>	d <sub>1</sub>
24	264	66	3
25	268	68	3
26	273	70	3
27	277	71	3
28	277	71	3
30	281	73	3
32	317	77	4
34	321	78	4
35	321	78	4
36	325	79	4
38	329	81	4
40	333	82	4
42	333	82	4
44	336	83	4
45	336	83	4
46	340	84	4
48	344	86	4
50	344	86	4

订货说明 : 按产品编号、直径订货。

Order Description: Please mark item No. , diamete for order.



# 粗柄机用丝锥 (HSS/HSS-E) 221 222

## Coarse Shank Machine Taps (HSS/HSS-E) 221 222

- 丝锥分一支一组、二支一组、螺距为 3.5 以上为二支或三支一组，用户订货时请注明支组。
- 丝锥的螺纹公差带：机用丝锥为 H1、H2、H3。
- 丝锥通常生产右扣螺纹，如需左扣螺纹在订货时请注明。

- Taps are in groups : one or two taps for each group. Three taps are contained in the group for those with pitches above 3.5mm.
- The thread tolerance range of the taps : H1、H2、H3.
- The general taps are right-hand thread. Please specify if any left-hand thread taps are needed.



磨制 (Grinding)

材料 (Material) : W6Mo5Cr4V2



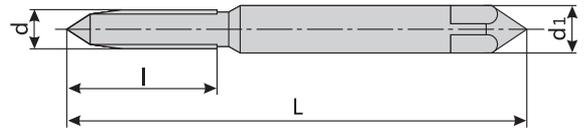
涂层 (Coating)

材料 (Material) : W6Mo5Cr4V2Co TiN



全磨制 (Grinding)

材料 (Material) : W6Mo5Cr4V2/HSS-E(含钴高速钢/Containing cobalt)



编号 (Item No.) : 221

单位 : mm

	公称尺寸	螺距	全长	刃长
	Nominal size	Thread pitch	Overall length	Length of flutes
	d	p	L	l
粗牙 Coarse Thread	M1	0.25	38.5	5.5
	M1.1	0.25	38.5	5.5
	M1.2	0.25	38.5	5.5
	M1.4	0.30	40	7
	M1.6	0.35	41	8
	M1.8	0.35	41	8
M2	0.40	41	8	

编号 (Item No.) : 221

单位 : mm

	公称尺寸	螺距	全长	刃长
	Nominal size	Thread pitch	Overall length	Length of flutes
	d	p	L	l
粗牙 Coarse Thread	M2.2	0.45	44.5	9.5
	M2.5	0.45	44.5	9.5
	M3	0.50	48	11
	M3.5	0.60	48	13
	M4	0.70	53	13
	M5	0.80	58	16
M6	1	66	19	

编号 (Item No.) : 222

单位 : mm

	公称尺寸	螺距	全长	刃长
	Nominal size	Thread pitch	Overall length	Length of flutes
	d	p	L	l
细牙 Fine Thread	M4×0.5	0.5	53	13
	M5×0.5	0.5	58	16

编号 (Item No.) : 222

单位 : mm

	公称尺寸	螺距	全长	刃长
	Nominal size	Thread pitch	Overall length	Length of flutes
	d	p	L	l
细牙 Fine Thread	M6×0.75	0.75	66	19



# 细柄机用丝锥 (HSS/HSS-E) 223 224

## Fine Shank Machine Taps (HSS/HSS-E) 223 224

- 机用丝锥的形式、尺寸和技术要求符合国际 ISO 标准和国家 GB 标准。
- 丝锥分一支一组、二支一组、螺距为 3.5 以上为二支或三支一组，用户订货时请注明支组。
- 丝锥的螺纹公差带：机用丝锥为 H1、H2、H3。
- 丝锥通常生产右扣螺纹，如需左扣螺纹在订货时请注明。

- The style, dimension and technical requirements of the machine taps conform to international ISO and national GB standards.
- Taps are in groups : one or two taps for each group. Three taps are contained in the group for those with pitches above 3.5mm.
- The thread tolerance range of the taps : H1、 H2、 H3.
- The general taps are right-hand thread. Please specify if any left-hand thread taps are needed.



铣制 (Milling)

材料 (Material) : W6Mo5Cr4V2



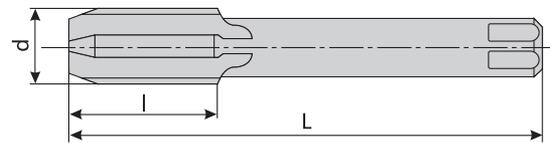
涂层 (Coating)

材料 (Material) : W6Mo5Cr4V2Co TiN



全磨制 (Grinding)

材料 (Material) : W6Mo5Cr4V2/HSS-E(含钴高速钢 /Containing cobalt)



编号 (Item No.) : 223

单位 : mm

	公称尺寸	螺距	全长	刃长
	Nominal size	Thread pitch	Overall length	Length of flutes
	d	p	L	l
粗牙 Coarse Thread	M7	1	66	19
	M8	1.25	72	22
	M9	1.25	72	22
	M10	1.5	80	24
	M11	1.5	85	25
	M12	1.75	89	29
	M14	2	95	30
	M16	2	102	32
	M18	2.5	112	37
	M20	2.5	112	37
M22	2.5	118	38	

编号 (Item No.) : 223

单位 : mm

	公称尺寸	螺距	全长	刃长
	Nominal size	Thread pitch	Overall length	Length of flutes
	d	p	L	l
粗牙 Coarse Thread	M24	3	130	45
	M27	3	135	45
	M30	3.5	138	48
	M33	3.5	151	51
	M36	4	162	57
	M39	4	170	60
	M42	4.5	170	60
	M45	4.5	187	67
	M48	5	187	67
	M52	5	200	70



编号 ( Item No. ) : 224

单位 : mm

	公称尺寸	螺距	全长	刃长
	Nominal size	Thread pitch	Overall length	Length of flutes
	d	p	L	l
	M7×0.75	0.75	66	19
	M8×1	1	72	22
	M8×0.75	0.75	66	19
	M9×1	1	72	22
	M9×0.75	0.75	66	19
	M10×1.25	1.25	80	24
	M10×1	1	80	24
	M10×0.75	0.75	73	20
	M11×1	1	80	22
	M11×0.75	0.75	80	22
	M12×1.5	1.5	89	29
	M12×1.25	1.25	89	29
	M12×1	1	80	22
	M14×1.5	1.5	95	30
	M14×1.25	1.25	95	30
	M14×1	1	87	22
	M16×1.5	1.5	102	32
细牙	M16×1	1	92	22
Fine	M18×2	2	112	37
Thread	M18×1.5	1.5	112	37
	M18×1	1	97	22
	M20×2	2	112	37
	M20×1.5	1.5	112	37
	M20×1	1	102	22
	M22×2	2	118	38
	M22×1.5	1.5	118	38
	M22×1	1	109	24
	M24×2	2	130	45
	M24×1.5	1.5	130	45
	M24×1	1	114	24
	M25×2	2	130	45
	M25×1.5	1.5	130	45
	M26×1.5	1.5	120	35
	M27×2	2	127	37
	M27×1.5	1.5	127	37
	M27×1	1	120	25
	M28×2	2	127	37

编号 ( Item No. ) : 224

单位 : mm

	公称尺寸	螺距	全长	刃长
	Nominal size	Thread pitch	Overall length	Length of flutes
	d	p	L	l
	M28×1.5	1.5	127	37
	M28×1	1	120	25
	M30×3	3	138	48
	M30×2	2	127	37
	M30×1.5	1.5	127	37
	M30×1	1	120	25
	M32×2	2	137	37
	M32×1.5	1.5	137	37
	M33×3	3	151	51
	M33×2	2	137	37
	M33×1.5	1.5	137	37
	M36×3	3	162	57
	M36×2	2	144	39
	M36×1.5	1.5	144	39
	M38×1.5	1.5	149	39
	M39×3	3	170	60
	M39×2	2	149	39
细牙	M39×1.5	1.5	149	39
Fine	M40×3	3	170	60
Thread	M40×2	2	149	39
	M40×1.5	1.5	149	39
	M42×3	3	170	60
	M42×2	2	149	39
	M42×1.5	1.5	149	39
	M45×3	3	187	67
	M45×2	2	165	45
	M45×1.5	1.5	165	45
	M48×3	3	187	67
	M48×2	2	165	45
	M48×1.5	1.5	165	45
	M50×3	3	187	67
	M50×2	2	165	45
	M50×1.5	1.5	165	45
	M52×3	3	200	70
	M52×2	2	175	45
	M52×1.5	1.5	175	45

订货说明 : 按产品编号、规格、公差带级别、涂层 / 不涂层订货。例 : d=M12、H2 级、材料、涂层 ,

标记为 223-M12-H2-HSS- 涂层。

Order Description: Please mark item No. ,specification,level of tolerance zone,the material,grinding/milling/no coating/coating for order.

Example: d=M12 H2 level,materials,manufacture,coating ,marker with 223-M12-H2-HSS-grinding-coating.

注 : 全磨制指公称尺寸 ≤ 20 的规格。

Note: all the grinding size refers to the engineering of the specifications of the 20 or less.

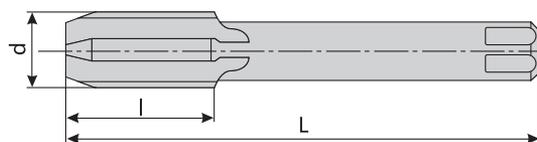
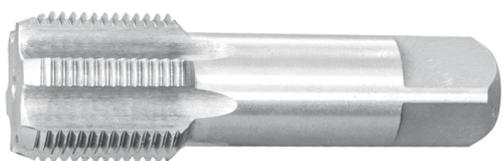


# 美国标准丝锥 (HSS) 234

## American Standard Taps (HSS) 234

- 美国标准丝锥的形式、尺寸符合机械行业 JB 标准。
- 本厂生产的美国标准丝锥是按 ANSI B94.9 生产制造的。
- 丝锥为一支一组，公差级别为 1 级、2 级、3 级。

- The style and dimension of the American standard taps conform to mechanical industry JB standards.
- The American standard taps manufactured by our works are in accordance with ANSI B94.9.
- Taps are in groups, one tap for each group. The tolerance range class are class 1, 2, 3.



编号 (Item No.) : 234

单位 : inch

公称尺寸 Nominal size	全长 Overall length	刃长 Length of flutes
d	L	l
1/4"-20	2-1/2	1
5/16"-18	2-23/32	1-1/8
3/8"-16	2-15/16	1-1/4
7/16"-14	3-5/32	1-7/16
1/2"-13	3-3/8	1-21/32
9/16"-12	3-19/32	1-21/32
5/8"-11	3-13/16	1-13/16
3/4"-10	4-1/4	2
7/8"-9	4-11/16	2-7/32
1"-8	5-1/8	2-1/2
1-1/8"-7	5-7/16	2-9/16
1-1/4"-7	5-3/4	2-9/16
1-3/8"-6	6-1/16	3
1-1/2"-6	6-3/8	3

编号 (Item No.) : 234

单位 : inch

公称尺寸 Nominal size	全长 Overall length	刃长 Length of flutes
d	L	l
1/4"-28	2-1/2	1
5/16"-24	2-23/32	1-1/8
3/8"-24	2-15/16	1-1/4
7/16"-20	3-5/32	1-7/16
1/2"-20	3-3/8	1-21/32
9/16"-18	3-19/32	1-21/32
5/8"-18	3-13/16	1-13/16
3/4"-16	4-1/4	2
7/8"-14	4-11/16	2-7/32
1"-12	5-1/8	2-1/2
1-1/8"-12	5-7/16	2-9/16
1-1/4"-12	5-3/4	2-9/16
1-3/8"-12	6-1/16	3
1-1/2"-6	6-3/8	3

订货说明 : 按产品编号、规格和螺纹公差带订货。例 : d=1/4"-20 2 级 , 标记为 234-1/4"-20-2。

Order Description: Please mark item No. , specification and thread tolerance range class for order.

Example: for d=1/4"-20 class 2, marker with 234-1/4"-20-2.



# 螺尖丝锥 (HSS/HSS-E) 235 236

## Gun Taps (HSS/HSS-E) 235 236

- 螺尖丝锥的形式、尺寸符合机械行业 JB 标准。
  - 公差级别为 H1、H2、H3。
  - 螺尖丝锥是一种前排屑的内螺纹加工专用刀具，主要用于通孔螺纹加工，能避免切削堵塞造成的攻丝难题，实现高效螺纹切削；而且，其前排屑功能又避免了切屑对已加工螺纹的刮伤，从而使其更具有了高精度加工的特点。
  - 适合加工碳素钢，合金钢，不锈钢，铸钢等材料。
- The style, dimension of the gun taps conform to mechanical industry JB standards.
  - The tolerance range grades are H1、 H2、 H3.
  - Gun taps are special tool for internal thread with front chip removal, which is mainly used for through hole thread processing, and achieve high efficient thread processing without chip block issue. And front chip removal function avoids chip scratch on the processed thread, so that it has high precision machining features.
  - Suitable for processing carbon steel, alloy steel, stainless steel, cast steel and other material.



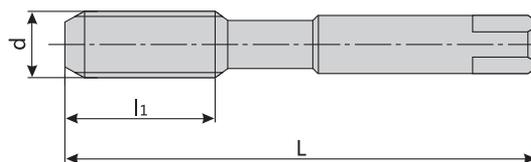
涂层 (Coating)

材料 (Material) : W6Mo5Cr4V2Co TiN



全磨制 (Grinding)

材料 (Material) : W6Mo5Cr4V2/HSS-E(含钴高速钢/Containing cobalt)



编号 (Item No.) : 235

单位 : mm

公称尺寸 Nominal size	螺距 Thread pitch	全长 Overall length	刃长 Length of flutes
d	p	L	l
M3	0.5	48	16.5
M3.5	0.6	50	19.5
M4	0.7	53	19
M5	0.8	58	23
M6	1.0	66	19
M8	1.25	72	22
M10	1.5	80	24

订货说明 : 按产品编号、规格、公差带级别、材料、涂层 / 全磨制订货。例 : d=M3、H2 级、材料、涂层。

标记为 235-M3-H2-HSS- 涂层。

Order Description: Please mark item No., specification, level of tolerance zone, the material, the coating/grinding for order.

Example: for d=M3 coarse thread H2 level, material, coating, marker with 235-M3-H2-HSS-coating.



# 粗柄螺旋槽丝锥 (HSS/HSS-E) 238 239

## Reinforced Shank Spiral Fluted Taps (HSS/HSS-E) 238 239

- 螺旋槽丝锥的形式、尺寸符合国家 GB 标准。
- 螺旋槽丝锥通常用于韧性金属制件上，对盲孔或断续表面孔的攻丝。
- 丝锥螺纹精度按 H1、H2、H3 三种公差带制造。
- The style and dimension of the spiral flute taps conform to national GB standard.
- Spiral flute taps are usually used for blind holes and intermittent surface holes tapping on the ductile metal parts.
- The accuracy of the taps is by H1、H2、H3.



磨制 (Grinding)

材料 (Material) : W6Mo5Cr4V2



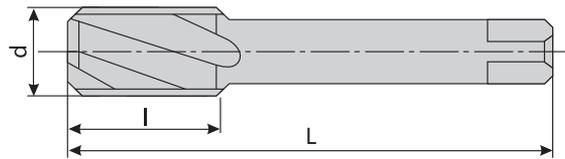
涂层 (Coating)

材料 (Material) : W6Mo5Cr4V2Co TiN



全磨制 (Grinding)

材料 (Material) : W6Mo5Cr4V2/HSS-E (含钴高速钢/Containing cobalt)



编号 (Item No.) : 238

单位 : mm

	规格 Specifications	公称尺寸 Nominal size	螺距 Thread pitch	全长 Overall length	刃长 Length of flutes
		d	p	L	l
粗牙 Coarse Thread	M3	3.0	0.50	48	13.0
	M3.5	3.5	0.60	50	15.0
	M4	4	0.70	53	15.0
	M4.5	4.5	0.75	53	15.0
	M5	5.0	0.80	58	18.5
	M6	6.0	1.00	66	22.5

编号 (Item No.) : 239

单位 : mm

	规格 Specifications	公称尺寸 Nominal size	螺距 Thread pitch	全长 Overall length	刃长 Length of flutes
		d	p	L	l
细牙 Fine Thread	M3×0.35	3.0	0.35	48	13.0
	M3.5×0.35	3.5	0.35	50	15.0
	M4×0.5	4	0.50	53	15.0
	M4.5×0.5	4.5	0.50	53	15.0
	M5×0.5	5.0	0.50	58	18.5
	M6×0.5	6.0	0.50	66	22.5
	M6×0.75	6.0	0.75	66	22.5

订货说明 : 按产品编号、规格、公差带级别、材料、涂层 / 全磨制订货。例 : d=M13 粗牙、H2 级、材料、涂层。

标记为 238-M3-H2-HSS-涂层。

Order Description: Please mark item No., specification, level of tolerance zone, the material, the coating/grinding for order.

Example: for d=M13 coarse thread H2 level, material, coating, marker with 238-M13-H2-HSS-coating.





# 细柄螺旋槽丝锥 (HSS/HSS-E) 240 241

## Thin Shank Spiral Fluted Taps (HSS/HSS-E) 240 241

- 螺旋槽丝锥的形式、尺寸符合国家 GB 标准。
- 螺旋槽丝锥通常用于韧性金属制件上，对盲孔或断续表面孔的攻丝。
- 丝锥螺纹精度按 H1、H2、H3 三种公差带制造。
- The style and dimension of the spiral flute taps conform to national GB standard.
- Spiral flute taps are usually used for blind holes and intermittent surface holes tapping on the ductile metal parts.
- The accuracy of the taps is by H1、H2、H3.

编号 (Item No.) : 240

单位 : mm

	规格	公称尺寸	螺距	全长	刃长
	Specifications	Nominal size	Thread pitch	Overall length	Length of flutes
		d	p	L	l
粗牙 Coarse Thread	M7	7	1.00	66	19
	M8	8	1.25	72	22
	M10	10	1.50	80	24
	M12	12	1.75	89	29
	M14	14	2.00	95	30
	M16	16	2.00	102	32

编号 (Item No.) : 240

单位 : mm

	规格	公称尺寸	螺距	全长	刃长
	Specifications	Nominal size	Thread pitch	Overall length	Length of flutes
		d	p	L	l
粗牙 Coarse Thread	M18	18	2.50	112	37
	M20	20	2.50	112	37
	M22	22	2.50	118	38
	M24	24	3.00	130	45
	M27	27	3.00	135	45

编号 (Item No.) : 241

单位 : mm

	规格	公称尺寸	螺距	全长	刃长
	Specifications	Nominal size	Thread pitch	Overall length	Length of flutes
		d	p	L	l
细牙 Fine Thread	M7×0.75	7	0.75	66	19
	M8×0.75	8	0.75	66	19
	M8×1	8	1.00	72	22
	M10×0.75	10	0.75	73	20
	M10×1	10	1.00	80	24
	M10×1.25	10	1.25	80	24
	M12×1	12	1.00	80	22
	M12×1.25	12	1.25	89	29
	M12×1.5	12	1.50	89	29
	M14×1	14	1.00	87	22
	M14×1.25	14	1.25	95	30
	M14×1.5	14	1.50	95	30
	M16×1	16	1.00	92	22
	M16×1.5	16	1.50	102	32
	M18×1	18	1.00	97	22

编号 (Item No.) : 241

单位 : mm

	规格	公称尺寸	螺距	全长	刃长
	Specifications	Nominal size	Thread pitch	Overall length	Length of flutes
		d	p	L	l
细牙 Fine Thread	M18×1.5	18	1.50	112	37
	M18×2	18	2.00	112	37
	M20×1	20	1.00	102	22
	M20×1.5	20	1.50	112	37
	M20×2	20	2.00	112	37
	M22×1	22	1.00	109	24
	M22×1.5	22	1.50	118	38
	M22×2	22	2.00	118	38
	M24×1	24	1.00	114	24
	M24×1.5	24	1.50	130	45
	M24×2	24	2.00	130	45
	M27×1	27	1.00	120	25
	M27×1.5	27	1.50	127	37
	M27×2	27	2.00	127	37

订货说明 : 按产品编号、规格、公差带级别、材料、涂层 / 不涂层订货。例 : d=M10×1 细牙、H2 级、材料、涂层，  
标记为 241-M10×1-H2-HSS- 涂层。

Order Description: Please mark item No. , specification ,level of tolerance zone, the material, the coating/no coating for order.

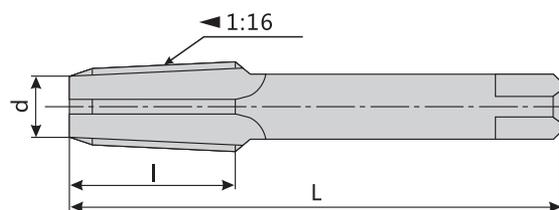
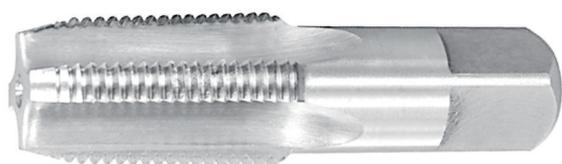
Example: for d=M10×1 fine thread H2 level,material , coating , marker with 241-M10×1-H2-HSS-coating.



# 55° 圆锥管螺纹丝锥 (HSS) 242

## 55° Taper Pipe Thread Taps (HSS) 242

- 圆锥管螺纹丝锥的形式、尺寸符合机械行业 JB 标准。
- The style and dimension of the taper pipe thread tap conform to mechanical industry JB standard.



编号 (Item No.) : 242

单位 : mm

公称尺寸 Nominal size	牙数 No. of thread (per in.)	螺距 Thread pitch	全长 Overall length	刃长 Length of flutes
d (inch)		p	L	l
Rc1/16	28	0.907	52	14
Rc1/8	28	0.907	59	15
Rc1/4	19	1.337	67	19
Rc3/8	19	1.337	75	21
Rc1/2	14	1.814	87	26
Rc3/4	14	1.814	96	28
Rc1	11	2.309	109	33
Rc1 1/4	11	2.309	119	36
Rc1 1/2	11	2.309	125	37
Rc2	11	2.309	140	41

订货说明 : 按产品编号、公称尺寸订货。

例 : 242-Rc1/16。

Order Description: Please mark item No. , nominal size for order.

Example: 242-Rc1/16.

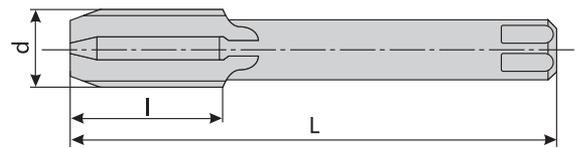


# 55° 圆柱管螺纹丝锥 (HSS) 243

## 55° Cylindrical Pipe Thread Taps (HSS) 243

- 锥柄键槽铣刀的形式、尺寸符合企业标准。

- The style and dimension of the keyseat cutters with morse taper shank conform to enterprise standards.



编号 ( Item No. ) : 243

单位 : mm

公称尺寸 Nominal size	牙数 No.of thread(per in.)	螺距 Thread pitch	全长 Overall length	刃长 Length of flutes
d(inch)		p	L	l
G1/16	28	0.907	52	14
G1/8	28	0.907	59	15
G1/4	19	1.337	67	19
G3/8	19	1.337	75	21
G1/2	14	1.814	87	26
G5/8	14	1.814	91	26
G3/4	14	1.814	96	28
G7/8	14	1.814	102	29
G1	11	2.309	109	33
G1 $\frac{1}{8}$	11	2.309	116	34
G1 $\frac{1}{4}$	11	2.309	119	36
G1 $\frac{1}{2}$	11	2.309	125	37
G1 $\frac{3}{4}$	11	2.309	132	39
G2	11	2.309	140	41

订货说明 : 按产品编号、公称尺寸订货。例 : 243-G1/16。

Order Description: Please mark item No. , nominal size for order.

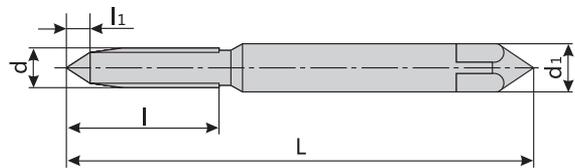
Example: 243-G1/16.



# 挤压丝锥 (HSS) 247

## Thread Forming Taps (HSS) 247

- 挤压丝锥的形式符合国家 GB 标准。
- 适合加工低碳素钢，不锈钢，铝合金、铜等材料。
- The type of the thread forming tap conform to GB standard.
- Suitable for processing mild steel, stainless steel, aluminum alloy, copper and other material.



编号 (Item No.) : 247

单位 : mm

公称尺寸 Nominal size	螺距 Thread pitch	全长 Overall length	刃长 Length of flutes	挤压锥长 Extrusion cone length	精度等级 Accuracy class
d	p	L	l	l <sub>1</sub>	
M2	0.40	36	15	3P/7P	I
	0.40	36	15	3P/7P	II
M2.2	0.45	36	15	3P/7P	I
	0.45	36	15	3P/7P	II
M2.5	0.45	36	15	3P/7P	I
	0.45	36	15	3P/7P	II
M3	0.50	40	17	3P/7P	I
	0.50	40	17	3P/7P	II
M3.5	0.60	40	17	3P/7P	I
	0.60	40	17	3P/7P	II
M4	0.70	45	20	3P/7P	I
	0.70	45	20	3P/7P	II
M5	0.80	50	22	3P/7P	I
	0.80	50	22	3P/7P	II
M6	1.00	55	24	3P/7P	I
	1.00	55	24	3P/7P	II
M8	1.25	65	25	3P/7P	I
	1.25	65	25	3P/7P	II
M10	1.50	70	25	3P/7P	I
	1.50	70	25	3P/7P	II
M12	1.75	80	25	3P/7P	I
	1.75	80	25	3P/7P	II

I 型为加工有色金属和低碳钢，II 型为加工不锈钢。另外，根据被加工螺孔是否通孔，又把 I 型、II 型挤压丝锥分为加工通孔和加工不通孔，挤压丝锥代号为 7P (通孔)、3P (不通孔)。

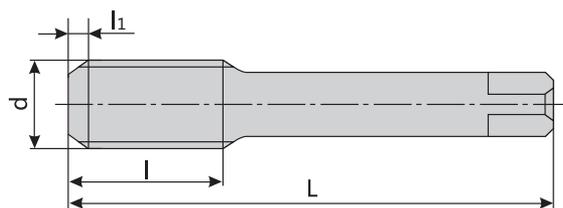
Type I is for processing nonferrous metal and mild steel, type II is for processing stainless steel. type I and type II thread forming tap are divided into through hole processing and blind hole processing. Thread forming tap codes are 7P (through hole) and 3P (blind hole).



# 高性能挤压丝锥 (HSS-E) 248

## High Performance Thread Forming Taps (HSS-E) 248

- 高性能挤压丝锥的形式符合国家 GB 标准。
- High-performance thread forming taps type form conform to GB standard.



编号 (Item No.) : 248

单位 : mm

公称尺寸 Nominal size	螺距 Thread pitch	全长 Overall length	刃长 Length of flutes	挤压锥长 Extrusion cone length
d	p	L	l	l <sub>1</sub>
M2	0.40	40	13	4P
M2.5	0.45	44	16	4P
M3	0.50	46	20	4P
M3.5	0.60	48	20	4P
M4	0.70	52	21	4P
M5	0.80	60	23	4P
M6	1.00	62	25	4P
M8	1.25	72	22	4P
M10	1.50	80	24	4P
M12	1.75	89	29	4P

订货说明 : 按产品编号、规格及螺纹公差带订货。

例 : d=M10、H2 级 , 标记为 248-M10×1-H2。

Order Description: Please mark item No. , specification and thread tolerance range class for order.

Example: for d=M10, H2 class , marker with 248-M10-H2.



# 铝合金专用螺旋槽丝锥 (HSS-E) 252

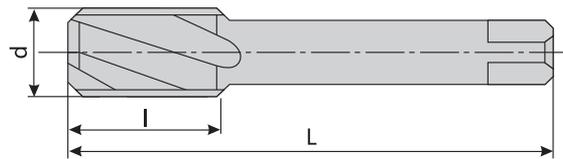
## Spiral Flute Taps For Aluminum Alloy (HSS-E) 252

- 丝锥公差带为 H2 ,通常用于长屑类铝合金、铜合金。禁止用于攻削带沉孔的盲孔螺纹。

- 丝锥的形式、尺寸和技术要求符合国际 ISO 标准和 国家 GB 标准。

- Taps tolerance is H2, normally used for long chip material such as aluminum alloy and copper alloy. Tapping for blind hole thread with counterbore is not allowed.

- Form, dimensions and technical requirement of Taps conform to ISO standard and GB standard.



编号 ( Item No. ) : 252

单位 : mm

公称尺寸 Nominal size	螺距 Thread pitch	全长 Overall length	刃长 Length of flutes
d	p	L	l
M3	0.5	56	6
M4	0.7	63	7
M5	0.8	70	8
M6	1.0	80	10
M8	1.25	90	14
M10	1.5	100	16
M12	1.75	110	18
M14	2.0	110	20
M16	2.0	110	22

订货说明 : 按产品编号、规格订货。

例 : d=M3 , 标记为 252-M3。

Order Description: Please mark item No. , specification for order.

Example: for d=M3, marker with 252-M3.

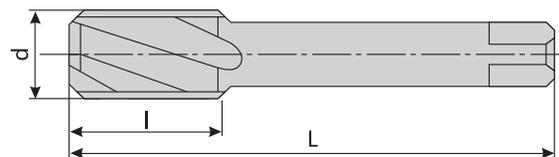


# 不锈钢专用螺旋槽丝锥 (HSS-E) 253

## Spiral Flute Taps For Stainless Steel (HSS-E) 253

- 丝锥公差带为 H2，通常用于不锈钢。禁止用于攻削带沉孔的盲孔螺纹。
- 丝锥的形式、尺寸和技术要求符合国际 ISO 标准和国家 GB 标准。

- Taps tolerance is H2, normally used for stainless steel. Tapping for blind hole thread with counterbore is not allowed.
- Form, dimensions and technical requirement of Taps conform to ISO standard and GB standard.



编号 ( Item No. ) : 253

单位 : mm

公称尺寸 Nominal size	螺距 Thread pitch	全长 Overall length	刃长 Length of flutes
d	p	L	l
M3	0.35	48	11
M3	0.5	48	11
M3.5	0.35	50	13
M3.5	0.6	50	13
M4	0.5	53	13
M4	0.7	53	13
M4.5	0.5	53	13
M4.5	0.75	53	13
M5	0.5	58	16
M5	0.8	58	16
M5.5	0.5	62	17
M6	0.5	66	19
M6	0.75	66	19
M6	1	66	19
M7	0.75	66	19
M7	1	66	19
M8	0.75	66	19
M8	1	72	22
M8	1.25	72	22
M9	0.75	66	19



编号 ( Item No. ) : 253

单位 : mm

公称尺寸 Nominal size	螺距 Thread pitch	全长 Overall length	刃长 Length of flutes
d	p	L	l
M9	1	72	22
M9	1.25	72	22
M10	0.75	73	20
M10	1	80	24
M10	1.25	80	24
M10	1.5	80	24
M11	0.75	80	22
M11	1	80	22
M11	1.5	85	25
M12	1	80	22
M12	1.25	89	29
M12	1.5	89	29
M12	1.75	89	29
M14	1	87	22
M14	1.25	95	30
M14	1.5	95	30
M14	2	95	30
M15	1.5	95	30
M15	2	95	30
M16	1	92	22
M16	1.5	102	32
M16	2	102	32
M17	1.5	102	32
M18	1	97	22
M18	1.5	112	37
M18	2	112	37
M18	2.5	112	37
M20	1	102	22
M20	1.5	112	37
M20	2	112	37
M20	2.5	112	37
M22	1	109	34
M22	1.5	118	38
M22	2	118	38
M22	2.5	118	38
M24	1	114	24
M24	1.5	130	45
M24	2	130	45
M24	3	130	45
M25	1.5	130	45

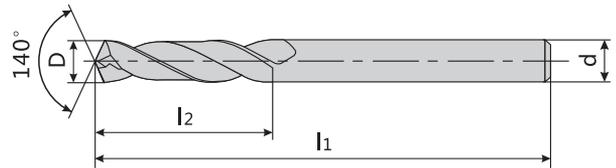




# 整体硬质合金麻花钻 301

## Solid Carbide Drills 301

- 适合加工钢类、不锈钢类、铸铁类、合金类等材料。
- 钻孔深度：(2-3)D
- 冷却方式：外冷却
- 螺旋角  $\beta$ ：30°
- Suitable for processing steel, stainless steel, cast iron, alloy, etc.
- Drilling hole depth: (2-3)D
- Cooling mode: outside cooling
- Helix angle  $\beta$  : 30°



编号 (Item No.) : 301

单位 : mm

公称尺寸 Nominal size	D	d	l <sub>2</sub>	l <sub>1</sub>
D2	2	2	10	40
D3	3	3	12	46
D3.3	3.3	3.5	14	49
D3.4	3.4	3.5	15	52
D3.5	3.5	3.5	15	52
D3.7	3.7	4	15	52
D4	4	4	17	55
D4.2	4.2	4.5	17	55
D4.3	4.3	4.5	18	58
D4.5	4.5	5	18	58
D4.65	4.65	5	18	58
D4.8	4.8	5	20	62
D5	5	5	20	62
D5.1	5.1	5.5	20	62
D5.2	5.2	5.5	20	62
D5.5	5.5	5.5	22	66
D5.8	5.8	6	22	66
D6	6	6	22	66
D6.1	6.1	6.5	23	70



编号 ( Item No. ) : 301

单位 : mm

公称尺寸 Nominal size	D	d	l <sub>2</sub>	l <sub>1</sub>
D6.2	6.2	6.5	23	70
D6.3	6.3	6.5	23	70
D6.5	6.5	6.5	23	70
D6.6	6.6	7	23	70
D6.75	6.75	7	23	74
D6.9	6.9	7	25	74
D7	7	7	25	74
D7.1	7.1	7.5	25	74
D7.4	7.4	7.5	25	74
D7.5	7.5	7.5	25	74
D7.8	7.8	8	27	79
D8	8	8	27	79
D8.1	8.1	8.5	27	79
D8.4	8.4	8.5	27	79
D8.5	8.5	8.5	27	79
D8.6	8.6	9	29	84
D8.7	8.7	9	29	84
D8.8	8.8	9	29	84
D9	9	9	29	84
D9.3	9.3	10	29	84
D9.5	9.5	10	29	84
D9.6	9.6	10	31	89
D9.8	9.8	10	31	89
D10	10	10	31	89
D10.25	10.25	11	31	89
D10.4	10.4	11	31	89
D10.5	10.5	11	31	89
D10.6	10.6	11	31	89
D10.8	10.8	11	33	95
D11	11	11	33	95
D11.2	11.2	12	33	95
D11.5	11.5	12	33	95
D11.8	11.8	12	33	95
D12.0	12	12	35	102
D12.25	12.25	13	35	102
D12.7	12.7	13	35	102
D12.8	12.8	13	35	102
D13	13	13	35	102
D13.1	13.1	14	35	102
D13.5	13.5	14	37	107
D13.8	13.8	14	37	107



编号 ( Item No. ) : 301

单位 : mm

公称尺寸 Nominal size	D	d	l <sub>2</sub>	l <sub>1</sub>
D14	14	14	37	107
D14.25	14.25	15	38	111
D14.5	14.5	15	38	111
D14.75	14.75	15	38	111
D14.8	14.8	15	38	111
D15	15	15	38	111
D15.1	15.1	16	38	115
D15.5	15.5	16	38	115
D15.8	15.8	16	38	115
D16	16	16	38	115

订货说明 : 请按产品编号。

例 : 301-D16

Order Description: Please mark item No.

Example: 301-D16

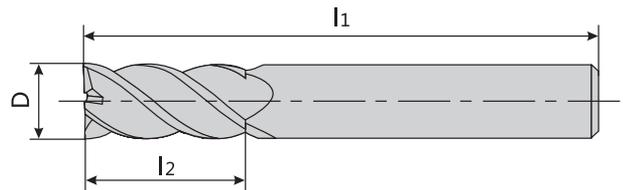


# 整体硬质合金立铣刀 302

## Solid Carbide End Mills 302

- 用于加工碳钢类、工具钢类、合金钢类、不锈钢类等材料。
- 端刃形式：两刃过中心
- 螺旋角  $\beta$  : 35°
- 刃数：4 刃

- Used for processing carbon steel, tool steel, alloy steel, stainless steel, etc.
- Cut : Center Cutting
- Helix angle  $\beta$  : 35°
- Number of flutes: 4 Flutes



编号 ( Item No. ) : 302

单位 : mm

公称尺寸 Nominal size	D	l <sub>2</sub>	l <sub>1</sub>
D3	3	9	40
D4	4	12	50
D5	5	15	50
D6×16	6	16	50
D6×20	6	20	60
D8	8	20	64
D10	10	22	70
D12	12	25	75
D14	14	32	90
D16	16	32	90
D18	18	38	100
D20	20	38	100

订货说明：请按产品编号。

例：302-D3

Order Description: Please mark item No.

Example: 302-D3



# 标准长度整体硬质合金钻切削参数

## Cutting Data For Solid Carbide Drills With Standard Length

外冷钻切削参数 Cutting data for drill with external coolant

钢材类型 Type of steel	切削速度 Cutting speed $V_c = (m/min)$		进给速度 Feeds $f$ (mm/rev) for diameter ranges (mm)					
	切速范围 Application range	推荐切速 Values	3-5	5-8	8-11	11-14	14-17	17-20
钢材及铸铁 < 210HB (700N/mm <sup>2</sup> ) Steel and cast steel up to 700 N/mm <sup>2</sup>	80-120	100	0.08-0.16	0.14-0.25	0.20-0.30	0.25-0.35	0.30-0.40	0.35-0.45
钢材及铸铁 < 30HRC (1000N/mm <sup>2</sup> ) From 700 up to 1000 N/mm <sup>2</sup>	60-110	85	0.07-0.14	0.12-0.18	0.15-0.22	0.20-0.25	0.25-0.30	0.30-0.40
钢材及铸铁 < 35HRC (1300N/mm <sup>2</sup> ) From 1000 up to 1300 N/mm <sup>2</sup>	50-80	70	0.06-0.12	0.10-0.16	0.15-0.20	0.18-0.25	0.20-0.28	0.22-0.30
钢材及铸铁 < 40HRC (1600N/mm <sup>2</sup> ) Steel over 1300 N/mm <sup>2</sup>	20-55	40	0.03-0.07	0.06-0.10	0.08-0.12	0.10-0.15	0.12-0.18	0.14-0.18
灰铁、球铁及可锻铸铁 Cast iron GG 15- GG 40 GGG 42 - GGG 70	50-120	80	0.10-0.20	0.18-0.32	0.30-0.38	0.35-0.45	0.40-0.50	0.45-0.55
沃斯田不锈钢 Stainniess , acid and heat resistant steel , cast steel lerratic (Ni < 2%) ball bearing steel , anneated	50-80	70	0.07-0.14	0.12-0.25	0.16-0.25	0.20-0.28	0.25-0.32	0.30-0.35
铝合金、镁合金、锌合金及铜合金 Aluminium, magneslum and zinc alloys	100-150	120	0.10-0.20	0.18-0.32	0.30-0.38	0.35-0.45	0.40-0.50	0.45-0.55

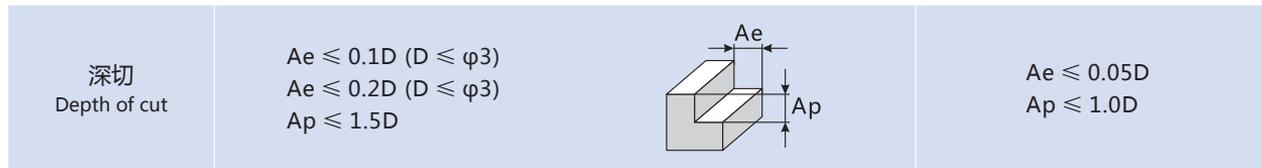


# 标准长度整体硬质合金直柄立铣刀切削参数

## Cutting Data For Solid Carbide Straight Shank Endmill With Standard Length

侧铣 (4 刃) 4Z-Side milling

工件材料 Work material	碳钢 铸铁 CARBON STEEL (-30HRC) AISI 1049 SCM CAST IRON FC250		合金钢 工具钢 预硬钢 ALLOY STEEL TOOL STEEL PRE-HARDENED STEEL (30-45HRC) AISI H13NAK		淬硬钢 HARDENED STEEL (45-55HRC) AISI H13	
	Dia (mm)	n (min <sup>-1</sup> )	V <sub>f</sub> (mm/min)	n (min <sup>-1</sup> )	V <sub>f</sub> (mm/min)	n (min <sup>-1</sup> )
1	30000	900	20000	600	15000	180
2	15000	900	10000	600	8000	180
3	10000	900	7000	600	5000	180
4	7500	900	5200	600	4000	180
5	6000	900	4200	600	3200	180
6	5000	900	3500	600	2700	180
8	4000	780	2800	520	2000	160
10	3200	680	2200	450	1600	140
12	2700	620	1900	410	1300	120
16	2000	550	1400	350	1000	170
20	1600	490	1100	340	800	140
25	1300	400	900	280	650	120



- 如切削奥氏体不锈钢和抗磨损合金时，使用非水溶性切削液最有效；
- 如果加工机械或工件安装的刚性太差或在操作时会发出杂音，请适度调整转速或给进速率；
- 如果是突进方式加工，请调降至 1/3 进给速度以下。
- In cutting austenitic stainless, the use of non-water-soluble cutting fluid is especially effective;
- If the rigidity of the machine or the clamping of the work piece is poor, or chattering is generated, please reduce the speed and the feed proportionately;
- When plunging, please set the feed at 1/3 or below of reference values.



# 标准长度整体硬质合金直柄立铣刀切削参数

## Cutting Data For Solid Carbide Straight Shank Endmill With Standard Length

开槽 (4刃) 4Z-Slotting

工件材料 Work material	碳钢 铸铁 CARBON STEEL (-30HRC) AISI 1049 SCM CAST IRON FC250		合金钢 工具钢 预硬钢 ALLOY STEEL TOOL STEEL PRE-HARDENED STEEL (30-45HRC) AISI H13NAK		淬硬钢 HARDENED STEEL (45-55HRC) AISI H13		
	Dia (mm)	n (min <sup>-1</sup> )	V <sub>f</sub> (mm/min)	n (min <sup>-1</sup> )	V <sub>f</sub> (mm/min)	n (min <sup>-1</sup> )	V <sub>f</sub> (mm/min)
	1	30000	720	20000	480	15000	144
	2	15000	720	10000	480	8000	144
	3	10000	720	7000	480	5000	144
	4	7500	720	5200	480	4000	144
	5	6000	720	4200	480	3200	144
	6	5000	720	3500	480	2700	144
	8	4000	624	2800	416	2000	128
	10	3200	544	2200	360	1600	112
	12	2700	496	1900	328	1300	96
	16	2000	440	1400	280	1000	136
	20	1600	392	1100	272	800	112
	25	1300	320	900	224	650	96

- 如切削奥氏体不锈钢和抗磨损合金时，使用非水溶性切削液最有效；
- 如果加工机械或工件安装的刚性太差或在操作时会发出杂音，请适度调整转速或给进速率；
- 如果是突进方式加工，请调降至 1/3 进给速度以下。
- In cutting austenitic stainless, the use of non-water-soluble cutting fluid is especially effective ;
- If the rigidity of the machine or the clamping of the work piece is poor , or chattering is generated , please reduce the speed and the feed proportionately ;
- When plunging , please set the feed at 1/3 or below of reference values .

# 硬质合金刀具切削定义及计算

## Cutting Definition And Calculation Of Carbide Alloy Cutting Tool

参数 parameter	计算公式 Calculation Formulas
铣刀直径 Mills diameter	D (mm)
每分钟转速 n [min <sup>-1</sup> ] RPM	$n = V_c \cdot 1000 / (D \pi)$
切削速度 V <sub>c</sub> [m/min] Cutting speed	$V_c = D \cdot \pi \cdot n / 1000$
每齿进给量 f <sub>z</sub> [mm/z] Feed rate per tooth	$f_z = V_f / (z \cdot n)$
每转进给量 F [mm/rev.] Feed rate per revolution	$F = f_z \cdot Z$
进给速度 V <sub>f</sub> [mm/min] Feed speed	$V_f = f_z \cdot z \cdot n = F \cdot n$
金属切削率 Q [cm <sup>3</sup> /min] Metal removal rate	$Q = a_e \cdot a_p \cdot v_f$
径向切深 a <sub>e</sub> [mm] Radial depth of cut	
轴向切深 a <sub>p</sub> [mm] Axial depth of cut	

- 硬质合金刀具的跳动量应达到下列指标：
  1. 常规切削：最大 0.02mm
  2. 高速切削：最大 0.01mm
- 尽量选用短系列立铣刀，这样可降低刀具的悬伸量。悬伸越短，刚性越高，加工过程中不易产生振动和变形，提高加工精度。悬伸长度减少 20%，会使刀具变形减少 50%
- The runout of solid carbide tool should reach following index:
  1. Normal cutting: max is 0.02mm
  2. High speed cutting: max is 0.01mm

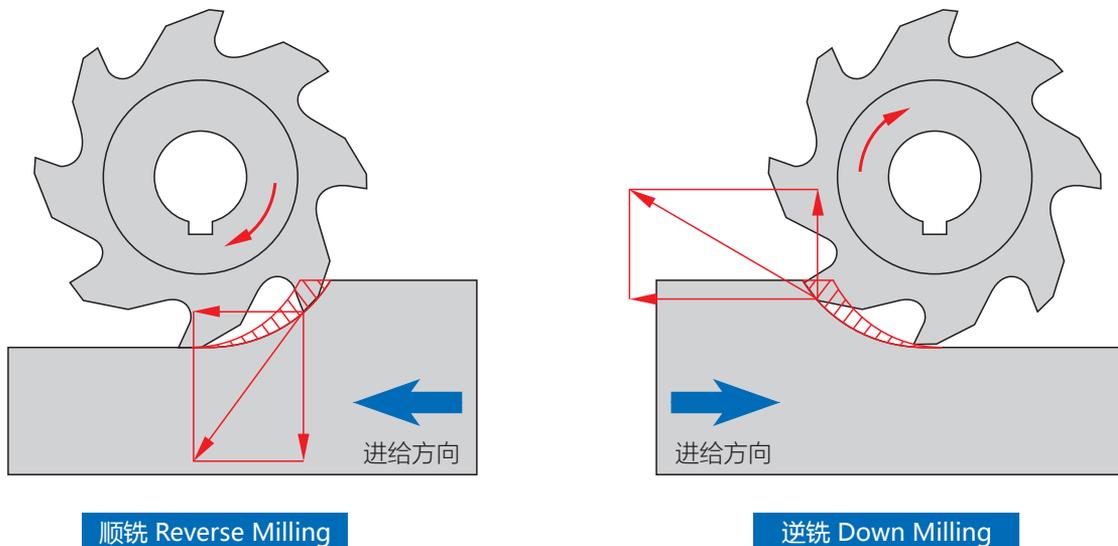
Short end mills are recommended to reduce tool overhang amount, the shorter overhang is to be used and the high rigidity will be higher, and it is not easy to produce vibration and deformation during machining, and machining accuracy will be increased. If 20% of overhang length is reduced, 50% tool deformation will be reduced.





# 顺铣和逆铣的差别和选择

## Difference And Selection Between Down Milling And Reverse Milling



- 顺铣时，切削刃受到压应力；逆铣时，切削刃受到拉应力。
- 硬质合金材料抗压强度比抗拉强度大很多。
- 使用立铣刀顺铣时，刀齿每次都是由工件表面开始切削，所以不宜用来加工有硬皮的工件。（如热处理过后、渗氮、渗碳、镀层、硬质合金等）
- 顺铣时，切削由厚变薄，刀刃与工件之间相互挤压，刀齿与加工表面相对滑动时摩擦力小，使得刀齿的磨损减小，表面硬化程度降低，表面粗糙度更高。
- 逆铣时，切屑由薄变厚，刀片切入产生强烈的摩擦，较顺铣产生更多的热量和加工表面硬化。
- 逆铣时，由于铣刀作用在工件的水平切削方向与工件进给方向相反，所以工作台丝杠与螺母的一个侧面紧密贴合。而顺铣切削时铣削力的方向与进给方向一致；极限情况下，当刀刃对工件的水平面作用力达到一定程度时工作台会发生窜动，从而将传动间隙留在后侧。这种周期性窜动，将严重影响加工质量并一定程度上的损害刀具。
- 铣削薄壁零件或精度较高的方肩铣采用逆铣。
- Cutting edge receives pressure stress when down milling, cutting edge receives tensile stress when reverse milling.
- Compressive strength of carbide alloy is much better than its tensile strength.
- When down milling by end mills, the cutter starts cutting from part surface each time, so it is not suitable for milling hard-skinned part. (e.g. after heat treatment, nitriding, carburizing, coating, carbide alloy and so on)
- When down milling, cutting from thick to thin, cutter and workpiece are squeezing together, friction between cutter and processed surface is small when they slide relative to each other, so the wear of cutter is reduced, the surface hardening is reduced and surface roughness is higher.
- When reverse milling, chip becomes thicker from thin, strong friction produced by cutting, more heat and processed surface hardening created than down milling.
- When reverse milling, milling cutter acts on the horizontal cutting direction of workpiece which is opposite to workpiece feed direction, so worktable ball screw and one side of screw nut are closely fitted. When milling force direction is the same as feed direction during down milling, worktable will shifting when the horizontal force of the workpiece reaches a certain degree under limit condition, so as to leave transmission clearance to the rear side, this periodic shifting will seriously affect processing quality and damage tool to a certain extent.
- Reverse milling is used for milling thin wall parts or square shoulder with high precision.