



Jet Arrow



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产品手册

Product Manual



辽宁抚工工具股份有限公司
Liaoning Fugong Tools Shares Co., Ltd.

公司地址: 辽宁省抚顺市望花区塔峪镇塔峪村
邮政编码: 113001
联系电话: 024-58684503
传 真: 024-58683888
电子邮箱: export@yc-ss.com
网 址: www.yc-ss.com

Add: Tayu, Wanghua, Fushun, Liaoning, P.R., China
Zip Code: 113001
Tel: +86-2458684503
Fax: +86-2458683888
E-mail: export@yc-ss.com
Web: www.yc-ss.com

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High Speed Steel

4341



- **Application:**
It is mainly used to produce drill, tap, and turning tools saw bit and high efficiency wood tool.

- **Characteristic:**
It is an economical low alloy high-speed steel with Good red hardness, good toughness and thermal plasticity. It is General used soft and moderate intensity metal.

● SIMILAR STEEL GRADE

GB	JIS	ASTM
W4Mo3Cr4Vsi	---	---
EN	BOHLER	ERASTEEL
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● CHEMICAL COMPOSITION

C	Mn	Si	S	P
0.83/0.93	0.20/0.40	0.70/1.00	≤0.03	≤0.03
Cr	V	W	Mo	
3.80/4.50	1.30/1.70	3.50/4.20	2.50/3.50	

- **Delivered Conditions:**
Hardness in the annealed ≤ 255 HB

- **Forms Supplied:**
Wire Rod Drawn Wire Round Bar

- **Available Surface Conditions And Diameter Size:**
Black Surface $\varnothing 1.6\text{mm}-6.0\text{mm}$
Bright Surface $\varnothing 6.1\text{mm}-100\text{mm}$
6.0-14.0 Centerless Ground
14.0-100 Peeled

● Heat Treatment

Hardening Temperature	1150-1180℃
Quenching Medium	Oil & salt bath
Tempering Temperature	540-560℃
Tempering Times	3 times
Hardness Achievable After Heat Treatment	62-64HRC

- **Ovality** Hot:Rolled 0.20mm Others 0.05mm

- **Grain Size:** $\leq 12.5\mu\text{m}$

- **Decarb Depth:** Hot Rolled 0.4+1.1%D
Cold Drawn 1.1%D

- **Surface Defect:**
No visible cracks, defects etc.

- **Internal Defect:**
No overheating, over burning, no crack

- **Diameter Tolerance:**
Hot Rolled $\pm 0.20\text{mm}$
Cold Drawn/Centerless Ground/Peeled Finishes
From $\pm 0.05\text{mm}$ to $\pm 0.08\text{mm}$

- **Length Tolerance:**
2m to 6m $\pm 50\text{mm}$

- **Test Certificate:**
To be attached on every supply, size and heat number.

High Speed Steel

M2



- **Application:**
This kind steel is suitable for producing in high quality cutting tools, such as drills, taps, end mills, center drills,round tool bits.

- **Characteristic:**
It is typical steel grade of W-Mo current hss,with high toughness, good thermal plasticity, high hardness,as well as red hardness and hot hardness.

● SIMILAR STEEL GRADE

GB	JIS	ASTM
W6Mo5Cr4V2	SKH51	M2
EN	BOHLER	ERASTEEL
1.3343	S600	EM2

● CHEMICAL COMPOSITION

C	Mn	Si	S	P
0.80/0.90	0.15/0.40	0.20/0.45	≤0.03	≤0.03
Cr	V	W	Mo	
3.80/4.40	1.75/2.20	5.50/6.75	4.50/5.50	

- **Delivered Conditions:**
Hardness in the annealed ≤ 255 HB

- **Forms Supplied:**
Wire Rod Drawn Wire Round Bar

- **Available Surface Conditions And Diameter Size:**
Black Surface $\varnothing 1.6\text{mm}-6.0\text{mm}$
Bright Surface $\varnothing 6.1\text{mm}-100\text{mm}$
6.0-14.0 Centerless Ground
14.0-100 Peeled

● Heat Treatment

Hardening Temperature	1180-1230℃
Quenching Medium	Oil & salt bath
Tempering Temperature	540-560℃
Tempering Times	3 times
Hardness Achievable After Heat Treatment	63-65HRC

- **Ovality** Hot:Rolled 0.20mm Others 0.05mm

- **Grain Size:** $\leq 12.5\mu\text{m}$

- **Decarb Depth:** Hot Rolled 0.4+1.1%D
Cold Drawn 1.1%D

- **Surface Defect:**
No visible cracks, defects etc.

- **Internal Defect:**
No overheating, over burning, no crack

- **Diameter Tolerance:**
Hot Rolled $\pm 0.20\text{mm}$
Cold Drawn/Centerless Ground/Peeled Finishes
From $\pm 0.05\text{mm}$ to $\pm 0.08\text{mm}$

- **Length Tolerance:**
2m to 6m $\pm 50\text{mm}$

- **Test Certificate:**
To be attached on every supply, size and heat number.

High Speed Steel

M35



Application:

This kind steel is suitable for conditions involving thermal stresses and continuous cutting. Heavy-duty milling cutters of all kinds, gear cutter, highly stressed twist drills and taps, profile knives, machining of high-strength material, broaches.

Characteristic:

It is one of the W-Mo Co hss grade with good cutting character. The red hardness, hot hardness and wearing resistance are all better than W6Mo5Cr4V2.

SIMILAR STEEL GRADE

GB	JIS	ASTM
W6Mo5Cr4V2Co5	SKH55	M35
EN	BOHLER	ERASTEEL
1.3243	S705	EM35

CHEMICAL COMPOSITION

C	Mn	Si	S	P
0.87/0.95	0.18/0.40	0.20/0.45	≤0.03	≤0.03
Cr	V	W	Mo	Co
3.80/4.50	1.70/2.10	5.90/6.70	4.70/5.20	4.50/5.00

Delivered Conditions:

Hardness in the annealed ≤270 HB

Forms Supplied:

Wire Rod Drawn Wire Round Bar

Available Surface Conditions And Diameter Size:

Black Surface Ø1.6mm-6.0mm

Bright Surface Ø 6.1mm-100mm

6.0-14.0 Centerless Ground

14.0-100 Peeled

Heat Treatment

Hardening Temperature	1180-1220℃
Quenching Medium	Oil & salt bath
Tempering Temperature	540-560℃
Tempering Times	3 times
Hardness Achievable After Heat Treatment	64-67HRC

Straightness:

≤2mm/M

Ovality:

Hot: Rolled 0.20mm Others 0.05mm

Carbides:

≤ 4 grade

Decarb Depth:

Hot Rolled 0.4+1.1%D Cold Drawn 1.1%D

Grain Size:

≤12.5um

Surface Defect:

No visible cracks, defects etc.

Internal Defect: No overheating, over burning, no crack

Diameter Tolerance:

Hot Rolled ±0.20mm

Cold Drawn/Centerless Ground/Peeled Finishes

From ±0.05mm to ±0.08mm

Length Tolerance:

2m to 6m ±50mm

Test Certificate:

To be attached on every supply, size and heat number.

HSS Straight Shank Twist Drill Bit



4341(W4Mo3Cr4Vsi)



Chemical Composition

Chemical Composition	C	Mn	Si	S	P
Content	0.83/0.93	0.20/0.40	0.70/1.00	≤0.03	≤0.03
Chemical Composition	Cr	V	W	Mo	Co
Content	3.80/4.50	1.30/1.70	3.50/4.20	2.50/3.50	--

◆ Good red hardness and toughness

◆ Economical and affordable

◆ Mainly used for producing drill, saw bit and high efficiency wood tool

HSS Straight Shank Twist Drill Bit

M2 (W6Mo5Cr4V2)



Chemical Composition

Chemical Composition	C	Mn	Si	S	P
Content	0.80/0.90	0.15/0.40	0.20/0.45	≤0.03	≤0.03
Chemical Composition	Cr	V	W	Mo	Co
Content	3.80/4.40	1.75/2.20	5.50/6.75	4.50/5.50	--

◆ Typical steel grade of W-Mo current HSS

◆ High red hardness and toughness

◆ Economical and affordable

M35 (W6Mo5Cr4V2Co5)



Chemical Composition

Chemical Composition	C	Mn	Si	S	P
Content	0.87/0.95	0.18/0.40	0.20/0.45	≤0.03	≤0.03
Chemical Composition	Cr	V	W	Mo	Co
Content	3.80/4.50	1.70/2.10	5.90/6.70	4.70/5.20	4.50/5.00

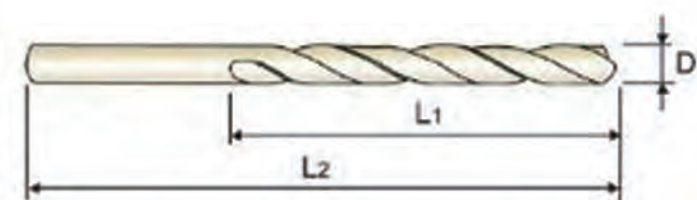
◆ Added Co, anti-corrosive better than M2

◆ Red hardness better than M2

◆ Wearing resistance better than M2

HSS Straight Shank Twist Drill Bit

Specifications size



D1	L1	L2
1	12	34
1.5	18	40
2	24	49
2.5	30	57
3	33	61
3.2	36	65
3.5	39	70
4	43	75

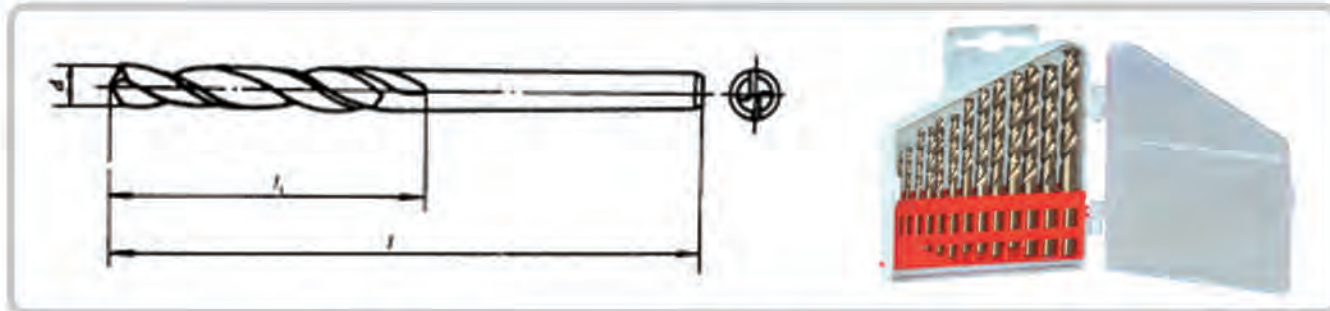
D1	L1	L2
4.2	43	75
4.5	47	80
4.8	52	86
5	52	86
5.2	52	86
5.5	57	93
6	57	93
6.5	63	101

D1	L1	L2
7	69	109
7.5	69	109
8	75	117
8.5	75	117
9	81	125
9.5	81	125
10	87	133
10.5	87	133

D1	L1	L2
11	94	142
11.5	94	142
12	101	151
12.5	101	151
13	101	151
13.5	108	160
14	108	160

HSS Straight Shank Twist Drill Bit

• Specifications size



Diameter of Drill						Flute Length		Overall Length	
D(Diameter)				Decimal Inch Equivalent	Millimeter Equivalent	L1		L	
Fraction	No.	Ltr.	mm			Inch	mm	Inch	mm
1/16	-	-	-	0.0625	1.588	7/8	22	1 7/8	48
5/64	-	-	-	0.0781	1.984	1	25	2	51
3/32	-	-	-	0.0938	2.383	1 1/4	32	2 1/4	57
7/64	-	-	-	0.1094	2.779	1 1/2	38	2 5/8	67
1/8	-	-	-	0.125	3.175	1 5/8	41	2 3/4	70
9/64	-	-	-	0.1406	3.571	1 3/4	44	2 7/8	73
5/32	-	-	-	0.1562	3.967	2	51	3 1/8	79
11/64	-	-	-	0.1719	4.366	2 1/8	54	3 1/4	83
3/16	-	-	-	0.1875	4.762	2 5/16	59	3 1/2	89
13/64	-	-	-	0.2031	5.159	2 7/16	62	3 5/8	92
7/32	-	-	-	0.2188	5.558	2 1/2	64	3 3/4	95
15/64	-	-	-	0.2344	5.954	2 5/8	67	3 7/8	98
1/4	-	-	-	0.25	6.35	2 3/4	70	4	102
17/64	-	-	-	0.2656	6.746	2 7/8	73	4 1/8	105
9/32	-	-	-	0.2812	7.142	2 15/16	75	4 1/4	108
19/64	-	-	-	0.2969	7.541	3 1/16	78	4 3/8	111
5/16	-	-	-	0.3125	7.938	3 3/16	81	4 1/2	114
21/64	-	-	-	0.3281	8.334	3 5/16	84	4 5/8	117
11/32	-	-	-	0.3438	8.733	3 7/16	87	4 3/4	121
23/64	-	-	-	0.3594	9.129	3 1/2	89	4 7/8	124
3/8	-	-	-	0.375	9.525	3 5/8	92	5	127
25/64	-	-	-	0.3906	9.921	3 3/4	95	5 1/8	130
13/32	-	-	-	0.4062	10.317	3 7/8	98	5 1/4	133
27/64	-	-	-	0.4219	10.716	3 15/16	100	5 3/8	137
7/16	-	-	-	0.4375	11.112	4 1/16	103	5 1/2	140
29/64	-	-	-	0.4531	11.509	4 3/16	106	5 5/8	143
15/32	-	-	-	0.4688	11.908	4 5/16	110	5 3/4	146
31/64	-	-	-	0.4844	12.304	4 3/8	111	5 7/8	149
1/2	-	-	-	0.5	12.7	4 1/2	114	6	152

HSS Straight Shank Twist Drill Bit

Part No.	Dia.	Flute Length	Overall Length
8005	0.3	3	19
8006	0.32	4	19
8007	0.35	4	19
8008	0.38	4	19
8009	0.4	5	20
8010	0.42	5	20
8011	0.45	5	20
8012	0.48	5	20
8013	0.5	6	22
8014	0.52	6	22
8015	0.55	7	24
8016	0.58	7	24
8017	0.6	7	24
8018	0.62	8	26
8019	0.65	8	26
8020	0.68	9	28
8021	0.7	9	28
8022	0.72	9	28
8023	0.75	9	28
8024	0.78	10	30
8025	0.8	10	30
8026	0.82	10	30
8027	0.85	10	30
8028	0.88	11	32
8029	0.9	11	32
8030	0.92	11	32
8031	0.95	11	32
8032	0.98	12	34
8033	1	12	34
8034	1.05	12	34
8035	1.1	14	36
8036	1.15	14	36
8037	1.2	16	38
8038	1.25	16	38
8039	1.3	16	38
8040	1.35	18	40
8041	1.4	18	40
8042	1.45	18	40
8043	1.5	18	40
8044	1.55	20	43
8045	1.6	20	43
8046	1.65	20	43
8047	1.7	20	43

Part No.	Dia.	Flute Length	Overall Length
8048	1.75	22	46
8049	1.8	22	46
8050	1.85	22	46
8051	1.9	22	46
8052	1.95	24	49
8053	2	24	49
8054	2.05	24	49
8055	2.1	24	49
8056	2.15	27	53
8057	2.2	27	53
8058	2.25	27	53
8059	2.3	27	53
8060	2.35	27	53
8061	2.4	30	57
8062	2.45	30	57
8063	2.5	30	57
8064	2.55	30	57
8065	2.6	30	57
8066	2.65	30	57
8067	2.7	33	61
8068	2.75	33	61
8069	2.8	33	61
8070	2.85	33	61
8071	2.9	33	61
8072	2.95	33	61
8073	3	33	61
8074	3.1	36	65
8075	3.2	36	65
8076	3.3	36	65
8077	3.4	39	70
8078	3.5	39	70
8079	3.6	39	70
8080	3.7	39	70
8081	3.8	43	75
8082	3.9	43	75
8083	4	43	75
8084	4.1	43	75
8085	4.2	43	75
8086	4.3	47	80
8087	4.4	47	80
8088	4.5	47	80
8089	4.6	47	80
8090	4.7	47	80

HSS Straight Shank Twist Drill Bit

Part No.	Dia.	Flute Length	Overall Length
8091	4.8	52	86
8092	4.9	52	86
8093	5	52	86
8094	5.1	52	86
8095	5.2	52	86
8096	5.3	52	86
8097	5.4	57	93
8098	5.5	57	93
8099	5.6	57	93
8100	5.7	57	93
8101	5.8	57	93
8102	5.9	57	93
8103	6	57	93
8104	6.1	63	101
8105	6.2	63	101
8106	6.3	63	101
8107	6.4	63	101
8108	6.5	63	101
8109	6.6	63	101
8110	6.7	63	101
8111	6.8	69	109
8112	6.9	69	109
8113	7	69	109
8114	7.1	69	109
8115	7.2	69	109
8116	7.3	69	109
8117	7.4	69	109
8118	7.5	69	109
8119	7.6	75	117
8120	7.7	75	117
8121	7.8	75	117
8122	7.9	75	117
8123	8	75	117
8124	8.1	75	117
8125	8.2	75	117
8126	8.3	75	117
8127	8.4	75	117
8128	8.5	75	117
8129	8.6	81	125
8130	8.7	81	125
8131	8.8	81	125
8132	8.9	81	125

Part No.	Dia.	Flute Length	Overall Length
8133	9	81	125
8134	9.1	81	125
8135	9.2	81	125
8136	9.3	81	125
8137	9.4	81	125
8138	9.5	81	125
8139	9.6	81	125
8140	9.7	87	133
8141	9.8	87	133
8142	9.9	87	133
8143	10	87	133
8144	10.1	87	133
8145	10.2	87	133
8146	10.3	87	133
8147	10.4	87	133
8148	10.5	87	133
8149	10.6	87	133
8150	10.7	94	142
8151	10.8	94	142
8152	10.9	94	142
8153	11	94	142
8154	11.1	94	142
8155	11.2	94	142
8156	11.3	94	142
8157	11.4	94	142
8158	11.5	94	142
8159	11.6	94	142
8160	11.7	94	142
8161	11.8	94	142
8162	11.9	101	151
8163	12	101	151
8164	12.1	101	151
8165	12.2	101	151
8166	12.3	101	151
8167	12.4	101	151
8168	12.5	101	151
8169	12.6	101	151
8170	12.7	101	151
8171	12.8	101	151
8172	12.9	101	151
8173	13	101	151

Hole Saw

H.S.S Hole Saw



SIZE RANGE: Dia.12mm~100mm hs-16

- **MATERIAL:**
High speed steel (SKH51)
- **SIZE RANGES:**
12mm~100mm diameter
- **APPLICATIONS:**
For tough drilling on 1.6mm thick iron plates.
- **USES:**
 - a) Electric work:
 - 1. Electric control box's push-button hole.
 - 2. Refrigeration machines.
 - b) Iron work:
 - 1. Sheet metal work
 - 2. Drill hole installation
- **SPECIAL FEATURES:**
 - a) Sharper teeth tip for easier cutting.
 - b) Longer product life, teeth stay sharp longer.
 - c) Better chip clearance.
 - d) For precision hole drilling.
- **SURFACE TREATMENT:**
 - a) Nickel coated
 - b) Golden finish
 - c) Sand blasted
 - d) Black oxide

- **MATERIAL:**
High speed steel (SKH51)
- **SIZE RANGES:**
12mm~100mm diameter
- **SPECIAL FEATURES:**
For tough drilling on 3.0mm thick stainless steel, sheet. Low wear-off.
- **USES:**
For drill operation on stainless steel sheet or square wares, cast irons. Iron plates and F.R.P. formed products.
- **APPLICABLE MACHINERY:**
 - a) Electrical drills.
 - b) Drilling presses.
 - c) Magnetic drill presses.
- **APPLICATIONS:**
 - a) Stainless steel conversions, doors & windows, stair rails, railings, screen doors, locks.
 - b) Manufacture of aluminum doors & windows.
 - c) Plumbing works, building A/C works.
 - d) Opening in machines, electrical control boxes.
 - e) Pigboat, ship make, F.R.P. manufacture.
- **SURFACE TREATMENT:**
 - a) Metal shiny
 - b) Coffee

Hole Saw

T.C.T Hole Saw



T.C.T-1



T.C.T-2



T.C.T-3

- **SIZE RANGES:**
φ15mm~φ100mm (with variation of 1mm)\
- **SPECIAL FEATURES:**
For tough drilling on 5mm thick stainless steel sheet. Low wear-off.
- **USES:**
For drill operation on stainless steel sheet or square wares, cast irons.
Iron plates and F.R.P. formed products.
- **APPLICABLE MACHINERY:**
 - a) Electrical drills.
 - b) Drilling presses.
 - c) Magnetic drill presses.
- **APPLICATIONS:**
 - a) Stainless steel conversions, doors & windows, stairs rails, railings, screen doors, locks.
 - b) Manufacture of aluminum doors & windows.
 - c) Plumbing works, building A/C works.
 - d) Opening in machines, electrical control boxes.
 - e) Pigboat, ship make, F.R.P. manufacture.

MEMO