

2006



drills
DRILLS





NOTES

STYLE	LIST NO.	PAGE
-------	----------	------

STYLE	LIST NO.	PAGE
-------	----------	------

JOBBER LENGTH, GENERAL PURPOSE

High Speed Steel

- Fractional Sizes, 118° Point, Surface Treated16001
- Fractional Diameters, 118° Point, Bright .16001
- Fractional Diameters, 118° Point, TiN Coated16001
- Wire Sizes, 118° Point, Surface Treated . .16012
- Wire Sizes, 118° Point, Bright16012
- Wire Sizes, 118° Point, TiN Coated16012
- Letter Sizes, 118° Point, Surface Treated .16023
- Letter Sizes, 118° Point, Bright16023
- Letter Sizes, 118° Point, TiN Coated16023
- Metric Sizes, 118° Point, Surface Treated .16034–6
- Metric Sizes, 118° Point, Bright16034–6

JOBBER LENGTH, HEAVY DUTY

High Speed Steel

- Fractional Sizes, 135° Split Point, Surface Treated16047
- Fractional Diameters, 135° Split Point, TiN Coated16047
- Wire Sizes, 135° Split Point, Surface Treated16058
- Wire Sizes, 135° Split Point, TiN Coated .16058
- Letter Sizes, 135° Split Point, Surface Treated1605-A9
- Letter Sizes, 135° Split TiN Coated1605-A9

Cobalt

- Fractional Sizes, 135° Split Point, Surface Treated160610
- Wire Sizes, 135° Split Point, Surface Treated160711
- Letter Sizes, 135° Split Point, Surface Treated160812

SCREW MACHINE LENGTHS, GENERAL PURPOSE

High Speed Steel

- Fractional Sizes, 118° Point, Surface Treated1609 . . .13–14

- Fractional Sizes, 118° Point, Bright1609 . . .13–14
- Wire Sizes, 118° Point, Surface Treated . .161015
- Letter Sizes, 118° Point, Bright161116

SCREW MACHINE LENGTHS, HEAVY DUTY

High Speed Steel

- Fractional Sizes, 135° Split Point, Surface Treated161217
- Fractional Sizes, 135° Split Point, TiN Coated161217
- Wire Sizes, 135° Split Point, Surface Treated161318
- Wire Sizes, 135° Split Point, TiN Coated .161318
- Letter Sizes, 135° Split Point, Surface Treated161419

Cobalt

- Fractional Sizes, 135° Split Point, Surface Treated161520
- Wire Sizes, 135° Split Point, Surface Treated161621
- Letter Sizes, 135° Split Point, Surface Treated161722

TAPER LENGTH, GENERAL PURPOSE

High Speed Steel

- Fractional Sizes, 118° Point, Surface Treated162023
- Fractional Diameters, 118° Point, Bright .162024
- Wire Sizes, 118° Point, Surface Treated . .162124
- Wire Sizes, 118° Point, Bright162124

REDUCED SHANK

High Speed Steel

- 1/2" Round Shank S & D, 118° Point, Surface Treated161825

SETS

Drill Sets1619 . . .26–29

Drills

- Drill Nomenclature30
- Speeds For Drilling31
- Drill Feeds And Speeds32
- Trouble Shooting Guide33

Technical Information

- Surface Treatments And Coatings34
- Tap Drill Sizes For Unified Inch Screw Threads35
- Tap Drill Sizes For Metric Screw Threads36
- Hardness Conversion Table37

Drill Standard Package Quantities

1/64 to 19/64 — 12 per package
5/16 to 1/2 — 6 per package
33/64 to 2 — 1 per package

1 to 80 — 12 per package
81 to 97 — 12 per package

A to N — 12 per package
O to Z — 6 per package

Coating Color Key

	Bright Finish
	Straw Finish
	Surface Treated
	TiN Coated

GENERAL PURPOSE, JOBBERS LENGTH DRILL 118° Point, Surface Treated, Bright, or TiN Coated

GENERAL FEATURES AND APPLICATIONS

Designed for portable and machine drilling in a broad range of steel, ferrous and non-ferrous materials (bright finish in non-ferrous), under many different conditions. TiN coating with increased surface hardness allows for extended tool life, greater lubricity, better chip ejection, increased productivity, and lower horsepower requirements.



LIST 1600

Fractional Sizes General Purpose, 118° Point

PACKAGING

1/64 to 19/64 — 12 per package
5/16 to 1/2 — 6 per package
33/64 to 11/16 — 1 per package

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO.		
				SURFACE TREATED	BRIGHT FINISH	TIN COATED
1/64	.0156	3/16	3/4	63360	63200	63640
1/32	.0312	1/2	1-3/8	63361	63201	63641
3/64	.0469	3/4	1-3/4	63362	63202	63642
1/16	.0625	7/8	1-7/8	63363	63203	63643
5/64	.0781	1	2	63364	63204	63644
3/32	.0938	1-1/4	2-1/4	63365	63205	63645
7/64	.1094	1-1/2	2-5/8	63366	63206	63646
1/8	.1250	1-5/8	2-3/4	63367	63207	63647
9/64	.1406	1-3/4	2-7/8	63368	63208	63648
5/32	.1562	2	3-1/8	63369	63209	63649
11/64	.1719	2-1/8	3-1/4	63370	63210	63650
3/16	.1875	2-5/16	3-1/2	63371	63211	63651
13/64	.2031	2-7/16	3-5/8	63372	63212	63652
7/32	.2188	2-1/2	3-3/4	63373	63213	63653
15/64	.2344	2-5/8	3-7/8	63374	63214	63654
1/4	.2500	2-3/4	4	63375	63215	63655
17/64	.2656	2-7/8	4-1/8	63376	63216	63656
9/32	.2812	2-15/16	4-1/4	63377	63217	63657
19/64	.2969	3-1/16	4-3/8	63378	63218	63658
5/16	.3125	3-3/16	4-1/2	63379	63219	63659
21/64	.3281	3-5/16	4-5/8	63380	63220	63660
11/32	.3438	3-7/16	4-3/4	63381	63221	63661

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO.		
				SURFACE TREATED	BRIGHT FINISH	TIN COATED
23/64	.3594	3-1/2	4-7/8	63382	63222	63662
3/8	.3750	3-5/8	5	63383	63223	63663
25/64	.3906	3-3/4	5-1/8	63384	63224	63664
13/32	.4062	3-7/8	5-1/4	63385	63225	63665
27/64	.4219	3-15/16	5-3/8	63386	63226	63666
7/16	.4375	4-1/16	5-1/2	63387	63227	63667
29/64	.4531	4-3/16	5-5/8	63388	63228	63668
15/32	.4688	4-5/16	5-3/4	63389	63229	63669
31/64	.4844	4-3/8	5-7/8	63390	63230	63670
1/2	.5000	4-1/2	6	63391	63231	63671
33/64	.5156	4-13/16	6-5/8	63392		
17/32	.5312	4-13/16	6-5/8	63393		
35/64	.5469	4-13/16	6-5/8	63394		
9/16	.5625	4-13/16	6-5/8	63395		
37/64	.5781	4-13/16	6-5/8	63396		
19/32	.5938	5-3/16	7-1/8	63397		
39/64	.6094	5-3/16	7-1/8	63398		
5/8	.6250	5-3/16	7-1/8	63399		
41/64	.6406	5-3/16	7-1/8	63400		
21/32	.6562	5-3/16	7-1/8	63401		
43/64	.6719	5-5/8	7-5/8	63402		
11/16	.6875	5-5/8	7-5/8	63403		

LIST 1601 Wire Sizes

General Purpose, 118° Point

PACKAGING

1 to 80 — 12 per package

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO.		
				SURFACE TREATED	BRIGHT FINISH	TIN COATED
1	.2280	2-5/8	3-7/8	63410	63240	63680
2	.2210	2-5/8	3-7/8	63411	63241	63681
3	.2130	2-1/2	3-3/4	63412	63242	63682
4	.2090	2-1/2	3-3/4	63413	63243	63683
5	.2055	2-1/2	3-3/4	63414	63244	63684
6	.2040	2-1/2	3-3/4	63415	63245	63685
7	.2010	2-7/16	3-5/8	63416	63246	63686
8	.1990	2-7/16	3-5/8	63417	63247	63687
9	.1960	2-7/16	3-5/8	63418	63248	63688
10	.1935	2-7/16	3-5/8	63419	63249	63689
11	.1910	2-5/16	3-1/2	63420	63250	63690
12	.1890	2-5/16	3-1/2	63421	63251	63691
13	.1850	2-5/16	3-1/2	63422	63252	63692
14	.1820	2-3/16	3-3/8	63423	63253	63693
15	.1800	2-3/16	3-3/8	63424	63254	63694
16	.1770	2-3/16	3-3/8	63425	63255	63695
17	.1730	2-3/16	3-3/8	63426	63256	63696
18	.1695	2-1/8	3-1/4	63427	63257	63697
19	.1660	2-1/8	3-1/4	63428	63258	63698
20	.1610	2-1/8	3-1/4	63429	63259	63699
21	.1590	2-1/8	3-1/4	63430	63260	63700
22	.1570	2	3-1/8	63431	63261	63701
23	.1540	2	3-1/8	63432	63262	63702
24	.1520	2	3-1/8	63433	63263	63703
25	.1495	1-7/8	3	63434	63264	63704
26	.1470	1-7/8	3	63435	63265	63705
27	.1440	1-7/8	3	63436	63266	63706
28	.1405	1-3/4	2-7/8	63437	63267	63707
29	.1360	1-3/4	2-7/8	63438	63268	63708
30	.1285	1-5/8	2-3/4	63439	63269	63709
31	.1200	1-5/8	2-3/4	63440	63270	63710
32	.1160	1-5/8	2-3/4	63441	63271	63711
33	.1130	1-1/2	2-5/8	63442	63272	63712
34	.1110	1-1/2	2-5/8	63443	63273	63713
35	.1100	1-1/2	2-5/8	63444	63274	63714
36	.1065	1-7/16	2-1/2	63445	63275	63715
37	.1040	1-7/16	2-1/2	63446	63276	63716
38	.1015	1-7/16	2-1/2	63447	63277	63717
39	.0995	1-3/8	2-3/8	63448	63278	63718
40	.0980	1-3/8	2-3/8	63449	63279	63719

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO.		
				SURFACE TREATED	BRIGHT FINISH	TIN COATED
41	.0960	1-3/8	2-3/8	63450	63280	63720
42	.0935	1-1/4	2-1/4	63451	63281	63721
43	.0890	1-1/4	2-1/4	63452	63282	63722
44	.0860	1-1/8	2-1/8	63453	63283	63723
45	.0820	1-1/8	2-1/8	63454	63284	63724
46	.0810	1-1/8	2-1/8	63455	63285	63725
47	.0785	1	2	63456	63286	63726
48	.0760	1	2	63457	63287	63727
49	.0730	1	2	63458	63288	63728
50	.0700	1	2	63459	63289	63729
51	.0670	1	2	63460	63290	63730
52	.0635	7/8	1-7/8	63461	63291	63731
53	.0595	7/8	1-7/8	63462	63292	63732
54	.0550	7/8	1-7/8	63463	63293	63733
55	.0520	7/8	1-7/8	63464	63294	63734
56	.0465	3/4	1-3/4	63465	63295	63735
57	.0430	3/4	1-3/4	63466	63296	63736
58	.0420	11/16	1-5/8	63467	63297	63737
59	.0410	11/16	1-5/8	63468	63298	63738
60	.0400	11/16	1-5/8	63469	63299	63739
61	.0390	11/16	1-5/8	63470	63300	
62	.0380	5/8	1-1/2	63471	63301	
63	.0370	5/8	1-1/2	63472	63302	
64	.0360	5/8	1-1/2	63473	63303	
65	.0350	5/8	1-1/2	63474	63304	
66	.0330	1/2	1-3/8	63475	63305	
67	.0320	1/2	1-3/8	63476	63306	
68	.0310	1/2	1-3/8	63477	63307	
69	.0292	1/2	1-3/8	63478	63308	
70	.0280	3/8	1-1/4	63479	63309	
71	.0260	3/8	1-1/4	63480	63310	
72	.0250	5/16	1-1/8	63481	63311	
73	.0240	5/16	1-1/8	63482	63312	
74	.0225	1/4	1	63483	63313	
75	.0210	1/4	1	63484	63314	
76	.0200	3/16	7/8	63485	63315	
77	.0180	3/16	7/8	63486	63316	
78	.0160	3/16	7/8	63487	63317	
79	.0145	1/8	3/4	63488	63318	
80	.0135	1/8	3/4	63489	63319	

**LIST
1602**

**Letter Sizes
General Purpose, 118° Point**

PACKAGING

A to N — 12 per package
O to Z — 6 per package

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO.		
				SURFACE TREATED	BRIGHT FINISH	TIN COATED
A	.2340	2-5/8	3-7/8	63500	63330	63750
B	.2380	2-3/4	4	63501	63331	63751
C	.2420	2-3/4	4	63502	63332	63752
D	.2460	2-3/4	4	63503	63333	63753
E	.2500	2-3/4	4	63504	63334	63754
F	.2570	2-7/8	4-1/8	63505	63335	63755
G	.2610	2-7/8	4-1/8	63506	63336	63756
H	.2660	2-7/8	4-1/8	63507	63337	63757
I	.2720	2-7/8	4-1/8	63508	63338	63758
J	.2770	2-7/8	4-1/8	63509	63339	63759
K	.2810	2-15/16	4-1/4	63510	63340	63760
L	.2900	2-15/16	4-1/4	63511	63341	63761
M	.2950	3-1/16	4-3/8	63512	63342	63762

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO.		
				SURFACE TREATED	BRIGHT FINISH	TIN COATED
N	.3020	3-1/6	4-3/8	63513	63343	63763
O	.3160	3-3/16	4-1/2	63514	63344	63764
P	.3230	3-5/16	4-5/8	63515	63345	63765
Q	.3320	3-7/16	4-3/4	63516	63346	63766
R	.3390	3-7/16	4-3/4	63517	63347	63767
S	.3480	3-1/2	4-7/8	63518	63348	63768
T	.3580	3-1/2	4-7/8	63519	63349	63769
U	.3680	3-5/8	5	63520	63350	63770
V	.3770	3-5/8	5	63521	63351	63771
W	.3860	3-3/4	5-1/8	63522	63352	63772
X	.3970	3-3/4	5-1/8	63523	63353	63773
Y	.4040	3-7/8	5-1/4	63524	63354	63774
Z	.4130	3-7/8	5-1/4	63525	63355	63775

JOBBERS LENGTH, HIGH SPEED STEEL

METRIC, JOBBERS LENGTH DRILL

118° Point (Manufactured to DIN Standards),
Bright Finish to .50, Surface Treated .55 and Larger

GENERAL FEATURES AND APPLICATIONS

Designed for portable and machine drilling in a broad range of steel, ferrous and non-ferrous materials (bright finish in non-ferrous), under many different conditions. TiN coating with increased surface hardness allows for extended tool life, greater lubricity, better chip ejection, increased productivity, and lower horsepower requirements.



LIST 1603 Metric Sizes

General Purpose, 118° Point

PACKAGING

- .15 to 7.90 — 12 per package
- 8.00 to 12.50 — 6 per package
- 13.00 to 17.50 — 1 per package

DIA. MM	DEC. EQUIV.	FLUTE LENGTH		OVERALL LENGTH		EDP NO. BRIGHT FINISH
		MM	FRACT.	MM	FRAC.	
.15	.0059	1.50	1/16	19	3/4	65300
.16	.0063	1.50	1/16	19	3/4	65301
.17	.0067	1.50	1/16	19	3/4	65302
.18	.0071	1.50	1/16	19	3/4	65303
.19	.0075	1.50	1/16	19	3/4	65304
.20	.0079	2.50	3/32	19	3/4	65305
.21	.0083	2.50	3/32	19	3/4	65306
.22	.0087	2.50	3/32	19	3/4	65307
.23	.0091	2.50	3/32	19	3/4	65308
.24	.0094	2.50	3/32	19	3/4	65309
.25	.0098	3	1/8	19	3/4	65310
.26	.0102	3	1/8	19	3/4	65311
.27	.0106	3	1/8	19	3/4	65312
.28	.0110	3	1/8	19	3/4	65313
.29	.0114	3	1/8	19	3/4	65314
.30	.0118	3	1/8	19	3/4	65315
.32	.0126	4	5/32	19	3/4	65316
.34	.0134	4	5/32	19	3/4	65317
.35	.0138	4	5/32	19	3/4	65318
.36	.0142	4	5/32	19	3/4	65319
.38	.0150	4	5/32	19	3/4	65320
.40	.0157	5	3/16	20	25/32	65321
.42	.0165	5	3/16	20	25/32	65322
.44	.0173	5	3/16	20	25/32	65323
.45	.0177	5	3/16	20	25/32	65324
.46	.0181	5	3/16	20	25/32	65325
.48	.0189	5	3/16	20	25/32	65326
.50	.0197	6	1/4	22	7/8	65327

DIA. MM	DEC. EQUIV.	FLUTE LENGTH		OVERALL LENGTH		EDP NO. SURFACE TREATED
		MM	FRACT.	MM	FRAC.	
.55	.0217	7	9/32	24	15/16	65328
.60	.0236	7	9/32	24	15/16	65329
.65	.0256	8	5/16	26	1-1/32	65330
.70	.0276	9	11/32	28	1-3/32	65331
.75	.0295	9	11/32	28	1-3/32	65332
.80	.0315	10	13/32	30	1-3/16	65333
.85	.0335	10	13/32	30	1-3/16	65334
.90	.0354	11	27/64	32	1-1/4	65335
.95	.0374	11	27/64	32	1-1/4	65336
1.00	.0394	12	15/32	34	1-11/32	65337
1.05	.0413	12	15/32	34	1-11/32	65338
1.10	.0433	14	9/16	36	1-7/16	65339
1.15	.0453	14	9/16	36	1-7/16	65340
1.20	.0472	16	5/8	38	1-1/2	65341
1.25	.0492	16	5/8	38	1-1/2	65342
1.30	.0512	16	5/8	38	1-1/2	65343
1.35	.0531	18	23/32	40	1-9/16	65344
1.40	.0551	18	23/32	40	1-9/16	65345
1.45	.0571	18	23/32	40	1-9/16	65346
1.50	.0591	18	23/32	40	1-9/16	65347
1.55	.0610	20	25/32	43	1-11/16	65348
1.60	.0630	20	25/32	43	1-11/16	65349
1.65	.0650	20	25/32	43	1-11/16	65350
1.70	.0669	20	25/32	43	1-11/16	65351
1.75	.0689	22	7/8	46	1-13/16	65352
1.80	.0709	22	7/8	46	1-13/16	65353
1.85	.0728	22	7/8	46	1-13/16	65354
1.90	.0748	22	7/8	46	1-13/16	65355

continued

continued

Metric Sizes
General Purpose, 118° Point

DIA. MM	DEC. EQUIV.	FLUTE LENGTH		OVERALL LENGTH		EDP NO. SURFACE TREATED
		MM	FRACT.	MM	FRACT.	
1.95	.0768	24	15/16	49	1-15/16	65356
2.00	.0787	24	15/16	49	1-15/16	65357
2.05	.0807	24	15/16	49	1-15/16	65358
2.10	.0827	24	15/16	49	1-15/16	65359
2.15	.0846	27	1-1/16	53	2-3/32	65360
2.20	.0866	27	1-1/16	53	2-3/32	65361
2.25	.0886	27	1-1/16	53	2-3/32	65362
2.30	.0906	27	1-1/16	53	2-3/32	65363
2.35	.0925	27	1-1/16	53	2-3/32	65364
2.40	.0945	30	1-3/16	57	2-1/4	65365
2.45	.0965	30	1-3/16	57	2-1/4	65366
2.50	.0984	30	1-3/16	57	2-1/4	65367
2.60	.1024	30	1-3/16	57	2-1/4	65368
2.70	.1063	33	1-5/16	61	2-13/32	65369
2.75	.1083	33	1-5/16	61	2-13/32	65370
2.80	.1102	33	1-5/16	61	2-13/32	65371
2.90	.1142	33	1-5/16	61	2-13/32	65372
3.00	.1181	33	1-5/16	61	2-13/32	65373
3.10	.1220	36	1-7/16	65	2-9/16	65374
3.20	.1260	36	1-7/16	65	2-9/16	65375
3.25	.1280	36	1-7/16	65	2-9/16	65376
3.30	.1299	36	1-7/16	65	2-9/16	65377
3.40	.1339	39	1-17/32	70	2-3/4	65378
3.50	.1378	39	1-17/32	70	2-3/4	65379
3.60	.1417	39	1-17/32	70	2-3/4	65380
3.70	.1457	39	1-17/32	70	2-3/4	65381
3.75	.1476	39	1-17/32	70	2-3/4	65382
3.80	.1496	43	1-11/16	75	2-15/16	65383
3.90	.1535	43	1-11/16	75	2-15/16	65384
4.00	.1575	43	1-11/16	75	2-15/16	65385
4.10	.1614	43	1-11/16	75	2-15/16	65386
4.20	.1654	43	1-11/16	75	2-15/16	65387
4.25	.1673	43	1-11/16	75	2-15/16	65388
4.30	.1693	47	1-27/32	80	3-5/32	65389
4.40	.1732	47	1-27/32	80	3-5/32	65390
4.50	.1772	47	1-27/32	80	3-5/32	65391
4.60	.1811	47	1-27/32	80	3-5/32	65392
4.70	.1850	47	1-27/32	80	3-5/32	65393
4.75	.1870	47	1-27/32	80	3-5/32	65394
4.80	.1890	52	2-1/16	86	3-3/8	65395
4.90	.1929	52	2-1/16	86	3-3/8	65396
5.00	.1969	52	2-1/16	86	3-3/8	65397
5.10	.2008	52	2-1/16	86	3-3/8	65398
5.20	.2047	52	2-1/16	86	3-3/8	65399
5.25	.2067	52	2-1/16	86	3-3/8	65400

continued

DIA. MM	DEC. EQUIV.	FLUTE LENGTH		OVERALL LENGTH		EDP NO. SURFACE TREATED
		MM	FRACT.	MM	FRACT.	
5.30	.2087	52	2-1/16	86	3-3/8	65401
5.40	.2126	57	2-1/4	93	3-21/32	65402
5.50	.2165	57	2-1/4	93	3-21/32	65403
5.60	.2205	57	2-1/4	93	3-21/32	65404
5.70	.2244	57	2-1/4	93	3-21/32	65405
5.75	.2264	57	2-1/4	93	3-21/32	65406
5.80	.2283	57	2-1/4	93	3-21/32	65407
5.90	.2323	57	2-1/4	93	3-21/32	65408
6.00	.2362	57	2-1/4	93	3-21/32	65409
6.10	.2402	63	2-15/32	101	3-31/32	65410
6.20	.2441	63	2-15/32	101	3-31/32	65411
6.25	.2461	63	2-15/32	101	3-31/32	65412
6.30	.2480	63	2-15/32	101	3-31/32	65413
6.40	.2520	63	2-15/32	101	3-31/32	65414
6.50	.2559	63	2-15/32	101	3-31/32	65415
6.60	.2598	63	2-15/32	101	3-31/32	65416
6.70	.2638	63	2-15/32	101	3-31/32	65417
6.75	.2657	69	2-23/32	109	4-9/32	65418
6.80	.2677	69	2-23/32	109	4-9/32	65419
6.90	.2717	69	2-23/32	109	4-9/32	65420
7.00	.2756	69	2-23/32	109	4-9/32	65421
7.10	.2795	69	2-23/32	109	4-9/32	65422
7.20	.2835	69	2-23/32	109	4-9/32	65423
7.25	.2854	69	2-23/32	109	4-9/32	65424
7.30	.2874	69	2-23/32	109	4-9/32	65453
7.40	.2913	69	2-23/32	109	4-9/32	65426
7.50	.2953	69	2-23/32	109	4-9/32	65427
7.60	.2992	75	2-15/16	117	4-19/32	65497
7.70	.3032	75	2-15/16	117	4-19/32	65428
7.75	.3051	75	2-15/16	117	4-19/32	65429
7.80	.3071	75	2-15/16	117	4-19/32	65430
7.85	.3091	75	2-15/16	117	4-19/32	65431
7.90	.3110	75	2-15/16	117	4-19/32	65432
8.00	.3150	75	2-15/16	117	4-19/32	65433
8.10	.3189	75	2-15/16	117	4-19/32	65434
8.20	.3228	75	2-15/16	117	4-19/32	65435
8.25	.3248	75	2-15/16	117	4-19/32	65436
8.30	.3268	75	2-15/16	117	4-19/32	65437
8.40	.3307	75	2-15/16	117	4-19/32	65438
8.50	.3346	75	2-15/16	117	4-19/32	65439
8.60	.3386	81	3-3/16	125	4-29/32	65440
8.70	.3425	81	3-3/16	125	4-29/32	65441
8.75	.3445	81	3-3/16	125	4-29/32	65442
8.80	.3465	81	3-3/16	125	4-29/32	65443
8.90	.3504	81	3-3/16	125	4-29/32	65444

continued

LIST
1603 *continued*Metric Sizes
General Purpose, 118° Point

DIA. MM	DEC. EQUIV.	FLUTE LENGTH		OVERALL LENGTH		EDP NO.
		MM	FRACT.	MM	FRAC.	SURFACE TREATED
9.00	.3543	81	3-3/16	125	4-29/32	65445
9.10	.3583	81	3-3/16	125	4-29/32	65446
9.20	.3622	81	3-3/16	125	4-29/32	65447
9.25	.3642	81	3-3/16	125	4-29/32	65448
9.30	.3661	81	3-3/16	125	4-29/32	65449
9.40	.3701	81	3-3/16	125	4-29/32	65450
9.50	.3740	81	3-3/16	125	4-29/32	65451
9.60	.3780	87	3-7/16	133	5-1/4	65452
9.70	.3819	87	3-7/16	133	5-1/4	65453
9.75	.3839	87	3-7/16	133	5-1/4	65454
9.80	.3858	87	3-7/16	133	5-1/4	65455
9.90	.3898	87	3-7/16	133	5-1/4	65456
10.00	.3937	87	3-7/16	133	5-1/4	65457
10.10	.3976	87	3-7/16	133	5-1/4	65458
10.20	.4016	87	3-7/16	133	5-1/4	65459
10.30	.4055	87	3-7/16	133	5-1/4	65460
10.40	.4094	87	3-7/16	133	5-1/4	65461
10.50	.4134	87	3-7/16	133	5-1/4	65462
10.70	.4213	94	3-11/16	142	5-19/32	65464
10.80	.4252	94	3-11/16	142	5-19/32	65465
10.90	.4291	94	3-11/16	142	5-19/32	65466
11.00	.4331	94	3-11/16	142	5-19/32	65467
11.10	.4370	94	3-11/16	142	5-19/32	65468
11.20	.4409	94	3-11/16	142	5-19/32	65469
11.30	.4449	94	3-11/16	142	5-19/32	65470

DIA. MM	DEC. EQUIV.	FLUTE LENGTH		OVERALL LENGTH		EDP NO.
		MM	FRACT.	MM	FRAC.	SURFACE TREATED
11.40	.4488	94	3-11/16	142	5-19/32	65471
11.50	.4528	94	3-11/16	142	5-19/32	65472
11.60	.4567	94	3-11/16	142	5-19/32	65473
11.70	.4606	94	3-11/16	142	5-19/32	65474
11.80	.4646	94	3-11/16	142	5-19/32	65475
11.90	.4685	101	3-31/32	151	5-15/16	65476
12.00	.4724	101	3-31/32	151	5-15/16	65477
12.10	.4764	101	3-31/32	151	5-15/16	65478
12.20	.4803	101	3-31/32	151	5-15/16	65479
12.30	.4843	101	3-31/32	151	5-15/16	65480
12.40	.4882	101	3-31/32	151	5-15/16	65481
12.50	.4921	101	3-31/32	151	5-15/16	65482
12.60	.4961	101	3-31/32	151	5-15/16	65483
12.70	.5000	101	3-31/32	151	5-15/16	65484
12.80	.5039	101	3-31/32	151	5-15/16	65485
12.90	.5079	101	3-31/32	151	5-15/16	65486
13.00	.5118	101	3-31/32	151	5-15/16	65487
13.50	.5315	108	4-1/4	160	6-5/16	65488
14.00	.5512	108	4-1/4	160	6-5/16	65489
14.50	.5709	114	4-1/2	169	6-5/8	65490
15.00	.5906	114	4-1/2	169	6-5/8	65491
15.50	.6102	120	4-3/4	178	7	65492
16.00	.6299	120	4-3/4	178	7	65493
16.50	.6496	125	4-29/32	184	7-1/4	65494
17.00	.6693	125	4-29/32	184	7-1/4	65495
17.50	.6890	130	5-3/32	191	7-17/32	65496

MEDIUM DUTY, JOBBERS LENGTH DRILL
135° Split Point, Surface Treated or TiN Coated

GENERAL FEATURES AND APPLICATIONS

Medium duty aircraft type B drills are designed for more demanding applications. The 135° split point is self-centering, reduces thrust is quick starting and highly accurate. ideal for portable or machine drilling of low tensile strength alloy material and stainless steels. TiN coating with increased surface hardness allows for extended tool life, greater lubricity, better chip ejection, increased productivity, and lower horsepower requirements.



LIST
1604

Fractional Sizes
Heavy Duty, 135° Split Point

PACKAGING

3/64 to 19/64 — 12 per package
5/16 to 1/2 — 6 per package

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO.	
				SURFACE TREATED	TiN COATED
*3/64	.0469	3/4	1-3/4	63532	63782
1/16	.0625	7/8	1-7/8	63533	63783
5/64	.0781	1	2	63534	63784
3/32	.0938	1-1/4	2-1/4	63535	63785
7/64	.1094	1-1/2	2-5/8	63536	63786
1/8	.1250	1-5/8	2-3/4	63537	63787
9/64	.1406	1-3/4	2-7/8	63538	63788
5/32	.1562	2	3-1/8	63539	63789
11/64	.1719	2-1/8	3-1/4	63540	63790
3/16	.1875	2-5/16	3-1/2	63541	63791
13/64	.2031	2-7/16	3-5/8	63542	63792
7/32	.2188	2-1/2	3-3/4	63543	63793
15/64	.2344	2-5/8	3-7/8	63544	63794
1/4	.2500	2-3/4	4	63545	63795
17/64	.2656	2-7/8	4-1/8	63546	63796

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO.	
				SURFACE TREATED	TiN COATED
9/32	.2812	2-15/16	4-1/4	63547	63797
19/64	.2969	3-1/16	4-3/8	63548	63798
5/16	.3125	3-3/16	4-1/2	63549	63799
21/64	.3281	3-5/16	4-5/8	63550	63800
11/32	.3438	3-7/16	4-3/4	63551	63801
23/64	.3594	3-1/2	4-7/8	63552	63802
3/8	.3750	3-5/8	5	63553	63803
25/64	.3906	3-3/4	5-1/8	63554	63804
13/32	.4062	3-7/8	5-1/4	63555	63805
27/64	.4219	3-15/16	5-3/8	63556	63806
7/16	.4375	4-1/16	5-1/2	63557	63807
29/64	.4531	4-3/16	5-5/8	63558	63808
15/32	.4688	4-5/16	5-3/4	63559	63809
31/64	.4844	4-3/8	5-7/8	63560	63810
1/2	.5000	4-1/2	6	63561	63811

*Not split point

**LIST
1605** Wire Sizes

Medium Duty, 135° Split Point

PACKAGING

1 to 60 — 12 per package

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO.		DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO.	
				SURFACE TREATED	TIN COATED					SURFACE TREATED	TIN COATED
1	.2280	2-5/8	3-7/8	63570	63820	31	.1200	1-5/8	2-3/4	63600	63850
2	.2210	2-5/8	3-7/8	63571	63821	32	.1160	1-5/8	2-3/4	63601	63851
3	.2130	2-1/2	3-3/4	63572	63822	33	.1130	1-1/2	2-5/8	63602	63852
4	.2090	2-1/2	3-3/4	63573	63823	34	.1110	1-1/2	2-5/8	63603	63853
5	.2055	2-1/2	3-3/4	63574	63824	35	.1100	1-1/2	2-5/8	63604	63854
6	.2040	2-1/2	3-3/4	63575	63825	36	.1065	1-7/16	2-1/2	63605	63855
7	.2010	2-7/16	3-5/8	63576	63826	37	.1040	1-7/16	2-1/2	63606	63856
8	.1990	2-7/16	3-5/8	63577	63827	38	.1015	1-7/16	2-1/2	63607	63857
9	.1960	2-7/16	3-5/8	63578	63828	39	.0995	1-3/8	2-3/8	63608	63858
10	.1935	2-7/16	3-5/8	63579	63829	40	.0980	1-3/8	2-3/8	63609	63859
11	.1910	2-5/16	3-1/2	63580	63830	41	.0960	1-3/8	2-3/8	63610	63860
12	.1890	2-5/16	3-1/2	63581	63831	42	.0935	1-1/4	2-1/4	63611	63861
13	.1850	2-5/16	3-1/2	63582	63832	43	.0890	1-1/4	2-1/4	63612	63862
14	.1820	2-3/16	3-3/8	63583	63833	44	.0860	1-1/8	2-1/8	63613	63863
15	.1800	2-3/16	3-3/8	63584	63834	45	.0820	1-1/8	2-1/8	63614	63864
16	.1770	2-3/16	3-3/8	63585	63835	46	.0810	1-1/8	2-1/8	63615	63865
17	.1730	2-3/16	3-3/8	63586	63836	47	.0785	1	2	63616	63866
18	.1695	2-1/8	3-1/4	63587	63837	48	.0760	1	2	63617	63867
19	.1660	2-1/8	3-1/4	63588	63838	49	.0730	1	2	63618	63868
20	.1610	2-1/8	3-1/4	63589	63839	50	.0700	1	2	63619	63869
21	.1590	2-1/8	3-1/4	63590	63840	51	.0670	1	2	63620	63870
22	.1570	2	3-1/8	63591	63841	52	.0635	7/8	1-7/8	63621	63871
23	.1540	2	3-1/8	63592	63842	*53	.0595	7/8	1-7/8	63622	
24	.1520	2	3-1/8	63593	63843	*54	.0550	7/8	1-7/8	63623	
25	.1495	1-7/8	3	63594	63844	*55	.0520	7/8	1-7/8	63624	
26	.1470	1-7/8	3	63595	63845	*56	.0465	3/4	1-3/4	63625	
27	.1440	1-7/8	3	63596	63846	*57	.0430	3/4	1-3/4	63626	
28	.1405	1-3/4	2-7/8	63597	63847	*58	.0420	11/16	1-5/8	63627	
29	.1360	1-3/4	2-7/8	63598	63848	*59	.0410	11/16	1-5/8	63628	
30	.1285	1-5/8	2-3/4	63599	63849	*60	.0400	11/16	1-5/8	63629	

*Not split point

**LIST
1605-A**

Letter Sizes
Medium Duty, 135° Split Point

PACKAGING

A to N — 12 per package
O to Z — 6 per package

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO.	
				SURFACE TREATED	TIN COATED
A	.2340	2-5/8	3-7/8	63630	63872
B	.2380	2-3/4	4	63631	63873
C	.2420	2-3/4	4	63632	63874
D	.2460	2-3/4	4	63633	63875
E	.2500	2-3/4	4	63634	63876
F	.2570	2-7/8	4-1/8	63635	63877
G	.2610	2-7/8	4-1/8	63636	63878
H	.2660	2-7/8	4-1/8	63637	63879
I	.2720	2-7/8	4-1/8	63638	63880
J	.2770	2-7/8	4-1/8	63639	63881
K	.2810	2-15/16	4-1/4	63672	63882
L	.2900	2-15/16	4-1/4	63673	63883
M	.2950	3-1/16	4-3/8	63674	63884

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO.	
				SURFACE TREATED	TIN COATED
N	.3020	3-1/16	4-3/8	63675	63885
O	.3160	3-3/16	4-1/2	63676	63886
P	.3230	3-5/16	4-5/8	63677	63887
Q	.3320	3-7/16	4-3/4	63678	63888
R	.3390	3-7/16	4-3/4	63679	63889
S	.3480	3-1/2	4-7/8	63740	63890
T	.3580	3-1/2	4-7/8	63741	63891
U	.3680	3-5/8	5	63742	63892
V	.3770	3-5/8	5	63743	63893
W	.3860	3-3/4	5-1/8	63744	63894
X	.3970	3-3/4	5-1/8	63745	63895
Y	.4040	3-7/8	5-1/4	63746	63896
Z	.4130	3-7/8	5-1/4	63747	63897

HEAVY DUTY, JOBBERS LENGTH DRILL 135° Split Point, Straw Finish

GENERAL FEATURES AND APPLICATIONS

Heavy duty aircraft type J drills are designed for tough, high tensile strength materials such as PH stainless steel, titanium, and inconel. The heat resistant cobalt material in combination with the 135° degree self-centering split point reduces thrust, is quick starting and highly accurate. Ideal for machine drilling.



LIST 1606

Fractional Sizes Heavy Duty, 135° Split Point

PACKAGING

3/64 to 19/64 — 12 per envelope
5/16 to 1/2 — 6 per envelope

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO. STRAW FINISH	DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO. STRAW FINISH
*3/64	.0469	3/4	1-3/4	68502	9/32	.2812	2-15/16	4-1/4	68517
1/16	.0625	7/8	1-7/8	68503	19/64	.2969	3-1/16	4-3/8	68518
5/64	.0781	1	2	68504	5/16	.3125	3-3/16	4-1/2	68519
3/32	.0938	1-1/4	2-1/4	68505	21/64	.3281	3-5/16	4-5/8	68520
7/64	.1094	1-1/2	2-5/8	68506	11/32	.3438	3-7/16	4-3/4	68521
1/8	.1250	1-5/8	2-3/4	68507	23/64	.3594	3-1/2	4-7/8	68522
9/64	.1406	1-3/4	2-7/8	68508	3/8	.3750	3-5/8	5	68523
5/32	.1562	2	3-1/8	68509	25/64	.3906	3-3/4	5-1/8	68524
11/64	.1719	2-1/8	3-1/4	68510	13/32	.4062	3-7/8	5-1/4	68525
3/16	.1875	2-5/16	3-1/2	68511	27/64	.4219	3-15/16	5-3/8	68526
13/64	.2031	2-7/16	3-5/8	68512	7/16	.4375	4-1/16	5-1/2	68527
7/32	.2188	2-1/2	3-3/4	68513	29/64	.4531	4-3/16	5-5/8	68528
15/64	.2344	2-5/8	3-7/8	68514	15/32	.4688	4-5/16	5-3/4	68529
1/4	.2500	2-3/4	4	68515	31/64	.4844	4-3/8	5-7/8	68530
17/64	.2656	2-7/8	4-1/8	68516	1/2	.5000	4-1/2	6	68531

*Not split point

Wire Sizes
Heavy Duty, 135° Split Point

PACKAGING
1 to 60 — 12 per package

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO.
				STRAW FINISH
1	.2280	2-5/8	3-7/8	68540
2	.2210	2-5/8	3-7/8	68541
3	.2130	2-1/2	3-3/4	68542
4	.2090	2-1/2	3-3/4	68543
5	.2055	2-1/2	3-3/4	68544
6	.2040	2-1/2	3-3/4	68545
7	.2010	2-7/16	3-5/8	68546
8	.1990	2-7/16	3-5/8	68547
9	.1960	2-7/16	3-5/8	68548
10	.1935	2-7/16	3-5/8	68549
11	.1910	2-5/16	3-1/2	68550
12	.1890	2-5/16	3-1/2	68551
13	.1850	2-5/16	3-1/2	68552
14	.1820	2-3/16	3-3/8	68553
15	.1800	2-3/16	3-3/8	68554
16	.1770	2-3/16	3-3/8	68555
17	.1730	2-3/16	3-3/8	68556
18	.1695	2-1/8	3-1/4	68557
19	.1660	2-1/8	3-1/4	68558
20	.1610	2-1/8	3-1/4	68559
21	.1590	2-1/8	3-1/4	68560
22	.1570	2	3-1/8	68561
23	.1540	2	3-1/8	68562
24	.1520	2	3-1/8	68563
25	.1495	1-7/8	3	68564
26	.1470	1-7/8	3	68565
27	.1440	1-7/8	3	68566
28	.1405	1-3/4	2-7/8	68567
29	.1360	1-3/4	2-7/8	68568
30	.1285	1-5/8	2-3/4	68569

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO.
				STRAW FINISH
31	.1200	1-5/8	2-3/4	68570
32	.1160	1-5/8	2-3/4	68571
33	.1130	1-1/2	2-5/8	68572
34	.1110	1-1/2	2-5/8	68573
35	.1100	1-1/2	2-5/8	68574
36	.1065	1-7/16	2-1/2	68575
37	.1040	1-7/16	2-1/2	68576
38	.1015	1-7/16	2-1/2	68577
39	.0995	1-3/8	2-3/8	68578
40	.0980	1-3/8	2-3/8	68579
41	.0960	1-3/8	2-3/8	68580
42	.0935	1-1/4	2-1/4	68581
43	.0890	1-1/4	2-1/4	68582
44	.0860	1-1/8	2-1/8	68583
45	.0820	1-1/8	2-1/8	68584
46	.0810	1-1/8	2-1/8	68585
47	.0785	1	2	68586
48	.0760	1	2	68587
49	.0730	1	2	68588
50	.0700	1	2	68589
51	.0670	1	2	68590
52	.0635	7/8	1-7/8	68591
*53	.0595	7/8	1-7/8	68592
*54	.0550	7/8	1-7/8	68593
*55	.0520	7/8	1-7/8	68594
*56	.0465	3/4	1-3/4	68595
*57	.0430	3/4	1-3/4	68596
*58	.0420	11/16	1-5/8	68597
*59	.0410	11/16	1-5/8	68598
*60	.0400	11/16	1-5/8	68599

*Not split point

LIST 1608 Letter Sizes
Heavy Duty, 135° Split Point

PACKAGING

A to N — 12 per package
O to Z — 6 per package

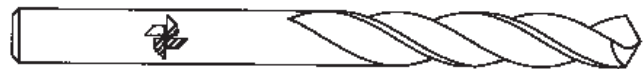
DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO. STRAW FINISH
A	.2340	2-5/8	3-7/8	68610
B	.2380	2-3/4	4	68611
C	.2420	2-3/4	4	68612
D	.2460	2-3/4	4	68613
E	.2500	2-3/4	4	68614
F	.2570	2-7/8	4-1/8	68615
G	.2610	2-7/8	4-1/8	68616
H	.2660	2-7/8	4-1/8	68617
I	.2720	2-7/8	4-1/8	68618
J	.2770	2-7/8	4-1/8	68619
K	.2810	2-15/16	4-1/4	68620
L	.2900	2-15/16	4-1/4	68621
M	.2950	3-1/16	4-3/8	68622

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO. STRAW FINISH
N	.3020	3-1/16	4-3/8	68623
O	.3160	3-3/16	4-1/2	68624
P	.3230	3-5/16	4-5/8	68625
Q	.3320	3-7/16	4-3/4	68626
R	.3390	3-7/16	4-3/4	68627
S	.3480	3-1/2	4-7/8	68628
T	.3580	3-1/2	4-7/8	68629
U	.3680	3-5/8	5	68630
V	.3770	3-5/8	5	68631
W	.3860	3-3/4	5-1/8	68632
X	.3970	3-3/4	5-1/8	68633
Y	.4040	3-7/8	5-1/4	68634
Z	.4130	3-7/8	5-1/4	68635

GENERAL PURPOSE, SCREW MACHINE LENGTH DRILL High Speed Steel, 118° Point, Surface Treated

GENERAL FEATURES AND APPLICATIONS

Primarily used in screw machines. Shorter flute and overall length provides increase rigidity in machine drilling resulting in less deflection, increased tool life, and better hole accuracy. Designed to drill in a wide variety of low tensile strength materials.



LIST 1609 Fractional Sizes General Purpose, 118° Point

PACKAGING

3/64 to 19/64 — 12 per package
5/16 to 1/2 — 6 per package
33/64 to 2 — 1 per package

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO.	
				SURFACE TREATED	BRIGHT FINISH
3/64	.0469	1/2	1-3/8		68000
1/16	.0625	5/8	1-5/8		68001
5/64	.0781	11/16	1-11/16		68002
3/32	.0938	3/4	1-3/4		68003
7/64	.1094	13/16	1-13/16		68004
1/8	.1250	7/8	1-7/8		68005
9/64	.1406	15/16	1-15/16		68006
5/32	.1562	1	2-1/16		68007
11/64	.1719	1-1/16	2-1/8		68008
3/16	.1875	1-1/8	2-3/16		68009
13/64	.2031	1-3/16	2-1/4		68010
7/32	.2188	1-1/4	2-3/8		68011
15/64	.2344	1-5/16	2-7/16		68012
1/4	.2500	1-3/8	2-1/2		68013
17/64	.2656	1-7/16	2-5/8		68014
9/32	.2812	1-1/2	2-11/16		68015
19/64	.2969	1-9/16	2-3/4		68016
5/16	.3125	1-5/8	2-13/16		68017
21/64	.3281	1-11/16	2-15/16		68018
11/32	.3438	1-11/16	3		68019
23/64	.3594	1-3/4	3-1/16		68020
3/8	.3750	1-13/16	3-1/8		68021
25/64	.3906	1-7/8	3-1/4		68022
13/32	.4062	1-15/16	3-5/16		68023
27/64	.4219	2	3-3/8		68024

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO.	
				SURFACE TREATED	BRIGHT FINISH
7/16	.4375	2-1/16	3-7/16		68025
29/64	.4531	2-1/8	3-9/16		68026
15/32	.4688	2-1/8	3-5/8		68027
31/64	.4844	2-3/16	3-11/16		68028
1/2	.5000	2-1/4	3-3/4		68029
33/64	.5156	2-3/8	3-7/8	68030	
17/32	.5312	2-3/8	3-7/8	68031	
35/64	.5469	2-1/2	4	68032	
9/16	.5625	2-1/2	4	68033	
37/64	.5781	2-5/8	4-1/8	68034	
19/32	.5938	2-5/8	4-1/8	68035	
39/64	.6094	2-3/4	4-1/4	68036	
5/8	.6250	2-3/4	4-1/4	68037	
41/64	.6406	2-7/8	4-1/2	68038	
21/32	.6562	2-7/8	4-1/2	68039	
43/64	.6719	2-7/8	4-5/8	68040	
11/16	.6875	2-7/8	4-5/8	68041	
45/64	.7031	3	4-3/4	68042	
23/32	.7188	3	4-3/4	68043	
47/64	.7344	3-1/8	5	68044	
3/4	.7500	3-1/8	5	68045	
49/64	.7656	3-1/4	5-1/8	68046	
25/32	.7812	3-1/4	5-1/8	68047	
51/64	.7969	3-3/8	5-1/4	68048	
13/16	.8125	3-3/8	5-1/4	68049	

continued

LIST
1609 *continued*

Fractional Sizes
General Purpose, 118° Point

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO.	
				SURFACE TREATED	BRIGHT FINISH
53/64	.8281	3-1/2	5-3/8	68050	
27/32	.8438	3-1/2	5-3/8	68051	
55/64	.8594	3-1/2	5-1/2	68052	
7/8	.8750	3-1/2	5-1/2	68053	
57/64	.8906	3-5/8	5-5/8	68054	
29/32	.9062	3-5/8	5-5/8	68055	
59/64	.9219	3-3/4	5-3/4	68056	
15/16	.9375	3-3/4	5-3/4	68057	
61/64	.9531	3-7/8	5-7/8	68058	
31/32	.9688	3-7/8	5-7/8	68059	
63/64	.9844	4	6	68060	
1	1.0000	4	6	68061	
1-1/16	1.0625	4	6-1/4	68062	
1-1/8	1.1250	4	6-3/8	68063	

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO.	
				SURFACE TREATED	BRIGHT FINISH
1-3/16	1.1875	4-1/4	6-5/8	68064	
1-1/4	1.2500	4-3/8	6-3/4	68065	
1-5/16	1.3125	4-3/8	7	68066	
1-3/8	1.3750	4-1/2	7-1/8	68067	
1-7/16	1.4375	4-3/4	7-3/8	68068	
1-1/2	1.5000	4-7/8	7-1/2	68069	
1-9/16	1.5625	4-7/8	7-3/4	68070	
1-5/8	1.6250	4-7/8	7-3/4	68071	
1-11/16	1.6875	5-1/8	8	68072	
1-3/4	1.7500	5-1/8	8	68073	
1-13/16	1.8125	5-3/8	8-1/4	68074	
1-7/8	1.8750	5-3/8	8-1/4	68075	
1-15/16	1.9375	5-5/8	8-1/2	68076	
2	2.0000	5-5/8	8-1/2	68077	

Wire Sizes
General Purpose, 118° Point

PACKAGING
1 to 60 — 12 per package

				EDP NO.						EDP NO.	
DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	SURFACE TREATED	BRIGHT FINISH	DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	SURFACE TREATED	BRIGHT FINISH
1	.2280	1-5/16	2-7/16		68080	31	.1200	7/8	1-7/8		68110
2	.2210	1-5/16	2-7/16		68081	32	.1160	7/8	1-7/8		68111
3	.2130	1-1/4	2-3/8		68082	33	.1130	7/8	1-7/8		68112
4	.2090	1-1/4	2-3/8		68083	34	.1110	7/8	1-7/8		68113
5	.2055	1-1/4	2-3/8		68084	35	.1100	7/8	1-7/8		68114
6	.2040	1-1/4	2-3/8		68085	36	.1065	13/16	1-13/16		68115
7	.2010	1-3/16	2-1/4		68086	37	.1040	13/16	1-13/16		68116
8	.1990	1-3/16	2-1/4		68087	38	.1015	13/16	1-13/16		68117
9	.1960	1-3/16	2-1/4		68088	39	.0995	13/16	1-13/16		68118
10	.1935	1-3/16	2-1/4		68089	40	.0980	13/16	1-13/16		68119
11	.1910	1-3/16	2-1/4		68090	41	.0960	13/16	1-13/16		68120
12	.1890	1-3/16	2-1/4		68091	42	.0935	3/4	1-3/4		68121
13	.1850	1-1/8	2-3/16		68092	43	.0890	3/4	1-3/4		68122
14	.1820	1-1/8	2-3/16		68093	44	.0860	3/4	1-3/4		68123
15	.1800	1-1/8	2-3/16		68094	45	.0820	3/4	1-3/4		68124
16	.1770	1-1/8	2-3/16		68095	46	.0810	3/4	1-3/4		68125
17	.1730	1-1/8	2-3/16		68096	47	.0875	11/16	1-11/16		68126
18	.1695	1-1/16	2-1/8		68097	48	.0760	11/16	1-11/16		68127
19	.1660	1-1/16	2-1/8		68098	49	.0730	11/16	1-11/16		68128
20	.1610	1-1/16	2-1/8		68099	50	.0700	11/16	1-11/16		68129
21	.1590	1-1/16	2-1/8		68100	51	.0670	11/16	1-11/16		68130
22	.1570	1-1/16	2-1/8		68101	52	.0635	11/16	1-11/16		68131
23	.1540	1	2-1/16		68102	53	.0595	5/8	1-5/8		68132
24	.1520	1	2-1/16		68103	54	.0550	5/8	1-5/8		68133
25	.1495	1	2-1/16		68104	55	.0520	5/8	1-5/8		68134
26	.1470	1	2-1/16		68105	56	.0465	1/2	1-3/8		68135
27	.1440	1	2-1/16		68106	57	.0430	1/2	1-3/8		68136
28	.1405	15/16	1-15/16		68107	58	.0420	1/2	1-3/8		68137
29	.1360	15/16	1-15/16		68108	59	.0410	1/2	1-3/8		68138
30	.1285	15/16	1-15/16		68109	60	.0400	1/2	1-3/8		68139

LIST
1611Letter Sizes
General Purpose, 118° Point

PACKAGING

A to N — 12 per package

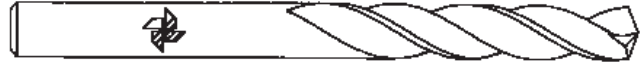
O to Z — 6 per package

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO.		DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO.	
				SURFACE TREATED	BRIGHT FINISH					SURFACE TREATED	BRIGHT FINISH
A	.2340	1-5/16	2-7/16		68150	N	.3020	1-5/8	2-13/16		68163
B	.2380	1-3/8	2-1/2		68151	O	.3160	1-11/16	2-15/16		68164
C	.2420	1-3/8	2-1/2		68152	P	.3230	1-11/16	2-15/16		68165
D	.2460	1-3/8	2-1/2		68153	Q	.3320	1-11/16	2-15/16		68166
E	.2500	1-3/8	2-1/2		68154	R	.3390	1-11/16	3		68167
F	.2570	1-7/16	2-5/8		68155	S	.3480	1-3/4	3-1/16		68168
G	.2610	1-7/16	2-5/8		68156	T	.3580	1-3/4	3-1/16		68169
H	.2660	1-1/2	2-11/16		68157	U	.3680	1-13/16	3-1/8		68170
I	.2720	1-1/2	2-11/16		68158	V	.3770	1-7/8	3-1/4		68171
J	.2770	1-1/2	2-11/16		68159	W	.3860	1-7/8	3-1/4		68172
K	.2810	1-1/2	2-11/16		68160	X	.3970	1-15/16	3-5/16		68173
L	.2900	1-9/16	2-3/4		68161	Y	.4040	1-15/16	3-5/16		68174
M	.2950	1-9/16	2-3/4		68162	Z	.4130	2	3-3/8		68175

HEAVY DUTY, SCREW MACHINE LENGTH DRILL
135° Split Point, Surface Treated or TiN Coated

GENERAL FEATURES AND APPLICATIONS

Heavy duty, aircraft type C drills are ideal for portable drilling. The 135° split point is self-centering, reduces thrust, and is quick starting. The short rugged constructions performs well in a broad range of materials in the iron and steel families. TiN coating with increased surface hardness allows for extended tool life, greater lubricity, better chip ejection, increased productivity, and lower horsepower requirements.



LIST
1612

Fractional Sizes
Heavy Duty, 135° Split Point

PACKAGING

1/16 to 19/64 — 12 per package
5/16 to 1/2 — 6 per package

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO.	
				SURFACE TREATED	TiN COATED
1/16	.0625	5/8	1-5/8	68180	68310
5/64	.0781	11/16	1-11/16	68181	68311
3/32	.0938	3/4	1-3/4	68182	68312
7/64	.1094	13/16	1-13/16	68183	68313
1/8	.1250	7/8	1-7/8	68184	68314
9/64	.1406	15/16	1-15/16	68185	68315
5/32	.1562	1	2-1/16	68186	68316
11/64	.1719	1-1/16	2-1/8	68187	68317
3/16	.1875	1-1/8	2-3/16	68188	68318
13/64	.2031	1-3/16	2-1/4	68189	68319
7/32	.2188	1-1/4	2-3/8	68190	68320
15/64	.2344	1-5/16	2-7/16	68191	68321
1/4	.2500	1-3/8	2-1/2	68192	68322
17/64	.2656	1-7/16	2-5/8	68193	68323
9/32	.2812	1-1/2	2-11/16	68194	68324

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO.	
				SURFACE TREATED	TiN COATED
19/64	.2969	1-9/16	2-3/4	68195	68325
5/16	.3125	1-5/8	2-13/16	68196	68326
21/64	.3281	1-11/16	2-15/16	68197	68327
11/32	.3438	1-11/16	3	68198	68328
23/64	.3594	1-3/4	3-1/16	68199	68329
3/8	.3750	1-13/16	3-1/8	68200	68330
25/64	.3906	1-7/8	3-1/4	68201	68331
13/32	.4062	1-15/16	3-5/16	68202	68332
27/64	.4219	2	3-3/8	68203	68333
7/16	.4375	2-1/16	3-7/16	68204	68334
29/64	.4531	2-1/8	3-9/16	68205	68335
15/32	.4688	2-1/8	3-5/8	68206	68336
31/64	.4844	2-3/16	3-11/16	68207	68337
1/2	.5000	2-1/4	3-3/4	68208	68338

LIST
1613 Wire Sizes

Heavy Duty, 135° Split Point

PACKAGING

1 to 60 — 12 per package

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO.	
				SURFACE TREATED	TIN COATED
1	.2280	1-5/16	2-7/16	68210	68340
2	.2210	1-5/16	2-7/16	68211	68341
3	.2130	1-1/4	2-3/8	68212	68342
4	.2090	1-1/4	2-3/8	68213	68343
5	.2055	1-1/4	2-3/8	68214	68344
6	.2040	1-1/4	2-3/8	68215	68345
7	.2010	1-3/16	2-1/4	68216	68346
8	.1990	1-3/16	2-1/4	68217	68347
9	.1960	1-3/16	2-1/4	68218	68348
10	.1935	1-3/16	2-1/4	68219	68349
11	.1910	1-3/16	2-1/4	68220	68350
12	.1890	1-3/16	2-1/4	68221	68351
13	.1850	1-1/8	2-3/16	68222	68352
14	.1820	1-1/8	2-3/16	68223	68353
15	.1800	1-1/8	2-3/16	68224	68354
16	.1770	1-1/8	2-3/16	68225	68355
17	.1730	1-1/8	2-3/16	68226	68356
18	.1695	1-1/16	2-1/8	68227	68357
19	.1660	1-1/16	2-1/8	68228	68358
20	.1610	1-1/16	2-1/8	68229	68359
21	.1590	1-1/16	2-1/8	68230	68360
22	.1570	1-1/16	2-1/8	68231	68361
23	.1540	1	2-1/16	68232	68362
24	.1520	1	2-1/16	68233	68363
25	.1495	1	2-1/16	68234	68364
26	.1470	1	2-1/16	68235	68365
27	.1440	1	2-1/16	68236	68366
28	.1405	15/16	1-15/16	68237	68367
29	.1360	15/16	1-15/16	68238	68368
30	.1285	15/16	1-15/16	68239	68369

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO.	
				SURFACE TREATED	TIN COATED
31	.1200	7/8	1-7/8	68240	68370
32	.1160	7/8	1-7/8	68241	68371
33	.1130	7/8	1-7/8	68242	68372
34	.1110	7/8	1-7/8	68243	68373
35	.1100	7/8	1-7/8	68244	68374
36	.1065	13/16	1-13/16	68245	68375
37	.1040	13/16	1-13/16	68246	68376
38	.1015	13/16	1-13/16	68247	68377
39	.0995	13/16	1-13/16	68248	68378
40	.0980	13/16	1-13/16	68249	68379
41	.0960	13/16	1-13/16	68250	68380
42	.0935	3/4	1-3/4	68251	68381
43	.0890	3/4	1-3/4	68252	68382
44	.0860	3/4	1-3/4	68253	68383
45	.0820	3/4	1-3/4	68254	68384
46	.0810	3/4	1-3/4	68255	68385
47	.0875	11/16	1-11/16	68256	68386
48	.0760	11/16	1-11/16	68257	68387
49	.0730	11/16	1-11/16	68258	68388
50	.0700	11/16	1-11/16	68259	68389
51	.0670	11/16	1-11/16	68260	68390
52	.0635	11/16	1-11/16	68261	68391
*53	.0595	5/8	1-5/8	68262	68392
*54	.0550	5/8	1-5/8	68263	68393
*55	.0520	5/8	1-5/8	68264	68394
*56	.0465	1/2	1-3/8	68265	68395
*57	.0430	1/2	1-3/8	68266	68396
*58	.0420	1/2	1-3/8	68267	68397
*59	.0410	1/2	1-3/8	68268	68398
*60	.0400	1/2	1-3/8	68269	68399

*Not split point

**LIST
1614**

**Letter Sizes
Heavy Duty, 135° Split Point**

PACKAGING

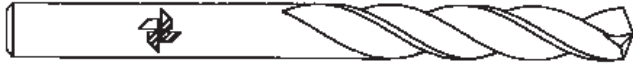
A to N — 12 per package
O to Z — 6 per package

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO. SURFACE TREATED
A	.2340	1-5/16	2-7/16	68280
B	.2380	1-3/8	2-1/2	68281
C	.2420	1-3/8	2-1/2	68282
D	.2460	1-3/8	2-1/2	68283
E	.2500	1-3/8	2-1/2	68284
F	.2570	1-7/16	2-5/8	68285
G	.2610	1-7/16	2-5/8	68286
H	.2660	1-1/2	2-11/16	68287
I	.2720	1-1/2	2-11/16	68288
J	.2770	1-1/2	2-11/16	68289
K	.2810	1-1/2	2-11/16	68290
L	.2900	1-9/16	2-3/4	68291
M	.2950	1-9/16	2-3/4	68292

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO. SURFACE TREATED
N	.3020	1-5/8	2-13/16	68293
O	.3160	1-11/16	2-15/16	68294
P	.3230	1-11/16	2-15/16	68295
Q	.3320	1-11/16	3	68296
R	.3390	1-11/16	3	68297
S	.3480	1-3/4	3-1/16	68298
T	.3580	1-3/4	3-1/16	68299
U	.3680	1-13/16	3-1/8	68300
V	.3770	1-7/8	3-1/4	68301
W	.3860	1-7/8	3-1/4	68302
X	.3970	1-15/16	3-5/16	68303
Y	.4040	1-15/16	3-5/16	68304
Z	.4130	2	3-3/8	68305

COBALT, HEAVY DUTY, SCREW MACHINE LENGTH DRILL
135° Split Point, Straw Finish

Made of heat resistant cobalt material these heavy duty, aircraft type C drills are ideal for portable drilling especially where extra rigidity is required in limited access areas. The 135° split point is self-centering, reduces thrust, and is quick starting. The short rugged construction performs well in a broad range of materials especially high alloys and work hardened material.



LIST
1615 Fractional Sizes
Heavy Duty, 135° Split Point

PACKAGING

1/16 to 19/64 — 12 per envelope
 5/16 to 1/2 — 6 per envelope

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO. STRAW FINISH
1/16	.0625	5/8	1-5/8	68700
5/64	.0781	11/16	1-11/16	68701
3/32	.0938	3/4	1-3/4	68702
7/64	.1094	13/16	1-13/16	68703
1/8	.1250	7/8	1-7/8	68704
9/64	.1406	15/16	1-15/16	68705
5/32	.1562	1	2-1/16	68706
11/64	.1719	1-1/16	2-1/8	68707
3/16	.1875	1-1/8	2-3/16	68708
13/64	.2031	1-3/16	2-1/4	68709
7/32	.2188	1-1/4	2-3/8	68710
15/64	.2344	1-5/16	2-7/16	68711
1/4	.2500	1-3/8	2-1/2	68712
17/64	.2656	1-7/16	2-5/8	68713
9/32	.2812	1-1/2	2-11/16	68714

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO. STRAW FINISH
19/64	.2969	1-9/16	2-3/4	68715
5/16	.3125	1-5/8	2-13/16	68716
21/64	.3281	1-11/16	2-15/16	68717
11/32	.3438	1-11/16	3	68718
23/64	.3594	1-3/4	3-1/16	68719
3/8	.3750	1-13/16	3-1/8	68720
25/64	.3906	1-7/8	3-1/4	68721
13/32	.4062	1-15/16	3-5/16	68722
27/64	.4219	2	3-3/8	68723
7/16	.4375	2-1/16	3-7/16	68724
29/64	.4531	2-1/8	3-9/16	68725
15/32	.4688	2-1/8	3-5/8	68726
31/64	.4844	2-3/16	3-11/16	68727
1/2	.5000	2-1/4	3-3/4	68728

**LIST
1616**

**Wire Sizes
Heavy Duty, 135° Split Point**

PACKAGING
1 to 60 — 12 per package

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO. STRAW FINISH
1	.2280	1-5/16	2-7/16	68730
2	.2210	1-5/16	2-7/16	68731
3	.2130	1-1/4	2-3/8	68732
4	.2090	1-1/4	2-3/8	68733
5	.2055	1-1/4	2-3/8	68734
6	.2040	1-1/4	2-3/8	68735
7	.2010	1-3/16	2-1/4	68736
8	.1990	1-3/16	2-1/4	68737
9	.1960	1-3/16	2-1/4	68738
10	.1935	1-3/16	2-1/4	68739
11	.1910	1-3/16	2-1/4	68740
12	.1890	1-3/16	2-1/4	68741
13	.1850	1-1/8	2-3/16	68742
14	.1820	1-1/8	2-3/16	68743
15	.1800	1-1/8	2-3/16	68744
16	.1770	1-1/8	2-3/16	68745
17	.1730	1-1/8	2-3/16	68746
18	.1695	1-1/16	2-1/8	68747
19	.1660	1-1/16	2-1/8	68748
20	.1610	1-1/16	2-1/8	68749
21	.1590	1-1/16	2-1/8	68750
22	.1570	1-1/16	2-1/8	68751
23	.1540	1	2-1/16	68752
24	.1520	1	2-1/16	68753
25	.1495	1	2-1/16	68754
26	.1470	1	2-1/16	68755
27	.1440	1	2-1/16	68756
28	.1405	15/16	1-15/16	68757
29	.1360	15/16	1-15/16	68758
30	.1285	15/16	1-15/16	68759

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO. STRAW FINISH
31	.1200	7/8	1-7/8	68760
32	.1160	7/8	1-7/8	68761
33	.1130	7/8	1-7/8	68762
34	.1110	7/8	1-7/8	68763
35	.1100	7/8	1-7/8	68764
36	.1065	13/16	1-13/16	68765
37	.1040	13/16	1-13/16	68766
38	.1015	13/16	1-13/16	68767
39	.0995	13/16	1-13/16	68768
40	.0980	13/16	1-13/16	68769
41	.0960	13/16	1-13/16	68770
42	.0935	3/4	1-3/4	68771
43	.0890	3/4	1-3/4	68772
44	.0860	3/4	1-3/4	68773
45	.0820	3/4	1-3/4	68774
46	.0810	3/4	1-3/4	68775
47	.0785	11/16	1-11/16	68776
48	.0760	11/16	1-11/16	68777
49	.0730	11/16	1-11/16	68778
50	.0700	11/16	1-11/16	68779
51	.0670	11/16	1-11/16	68780
52	.0635	11/16	1-11/16	68781
*53	.0595	5/8	1-5/8	68782
*54	.0550	5/8	1-5/8	68783
*55	.0520	5/8	1-5/8	68784
*56	.0465	1/2	1-3/8	68785
*57	.0430	1/2	1-3/8	68786
*58	.0420	1/2	1-3/8	68787
*59	.0410	1/2	1-3/8	68788
*60	.0400	1/2	1-3/8	68789

*Not split point

LIST
1617 Letter Sizes
Heavy Duty, 135° Split Point

PACKAGING

A to N — 12 per package
O to Z — 6 per package

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO. STRAW FINISH	DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO. STRAW FINISH
A	.2340	1-5/16	2-7/16	68800	N	.3020	1-5/8	2-13/16	68813
B	.2380	1-3/8	2-1/2	68801	O	.3160	1-11/16	2-15/16	68814
C	.2420	1-3/8	2-1/2	68802	P	.3230	1-11/16	2-15/16	68815
D	.2460	1-3/8	2-1/2	68803	Q	.3320	1-11/16	3	68816
E	.2500	1-3/8	2-1/2	68804	R	.3390	1-11/16	3	68817
F	.2570	1-7/16	2-5/8	68805	S	.3480	1-3/4	3-1/16	68818
G	.2610	1-7/16	2-5/8	68806	T	.3580	1-3/4	3-1/16	68819
H	.2660	1-1/2	2-11/16	68807	U	.3680	1-13/16	3-1/8	68820
I	.2720	1-1/2	2-11/16	68808	V	.3770	1-7/8	3-1/4	68821
J	.2770	1-1/2	2-11/16	68809	W	.3860	1-7/8	3-1/4	68822
K	.2810	1-1/2	2-11/16	68810	X	.3970	1-15/16	3-5/16	68823
L	.2900	1-9/16	2-3/4	68811	Y	.4040	1-15/16	3-5/16	68824
M	.2950	1-9/16	2-3/4	68812	Z	.4130	2	3-3/8	68825

GENERAL PURPOSE, TAPER LENGTH DRILL 118° Point, Surface Treated & Bright

GENERAL FEATURES AND APPLICATIONS

Designed for portable and machine drilling in a broad range of steel, ferrous and non-ferrous materials (bright finish in non-ferrous), where a length longer than Jobbers Length is required.



Fractional Sizes General Purpose, 118° Point

**LIST
1620**

PACKAGING

1/64 to 19/64 — 12 per package
5/16 to 1/2 — 6 per package
33/64 to 11/16 — 1 per package

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO.	
				BRIGHT FINISH	SURFACE TREATED
3/64"	0.0469	1-1/8"	2-1/4"	63000	63100
1/16"	0.0624	1-3/4"	3"	63001	63101
5/64"	0.0781	2"	3-3/4"	63002	63102
3/32"	0.0938	2-1/4"	4-1/4"	63003	63103
7/64"	0.1094	2-1/2"	4-5/8"	63004	63104
1/8"	0.1250	2-3/4"	5-1/8"	63005	63105
9/64"	0.1406	3"	5-3/8"	63006	63106
5/32"	0.1562	3"	5-3/8"	63007	63107
11/64"	0.1719	3-3/8"	5-3/4"	63008	63108
3/16"	0.1875	3-3/8"	5-3/4"	63009	63109
13/64"	0.2031	3-5/8"	6"	63010	63110
7/32"	0.2188	3-5/8"	6"	63011	63111
15/64"	0.2344	3-3/4"	6-1/8"	63012	63112
1/4"	0.2500	3-3/4"	6-1/8"	63013	63113
17/64"	0.2656	3-7/8"	6-1/4"	63014	63114
9/32"	0.2812	3-7/8"	6-1/4"	63015	63116
19/64"	0.2969	4"	6-3/8"	63016	63117
5/16"	0.3125	4"	6-3/8"	63017	63118
21/64"	0.3281	4-1/8"	6-1/2"	63018	63119
11/32"	0.3438	4-1/8"	6-1/2"	63019	63120

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO.	
				BRIGHT FINISH	SURFACE TREATED
23/64"	0.3594	4-1/4"	6-3/4"	63020	63121
3/8"	0.3750	4-1/4"	6-3/4"	63021	63122
25/64"	0.3906	4-3/8"	7"	63022	63124
3/32"	0.4062	4-3/8"	7"	63023	63125
27/64"	0.4219	4-5/8"	7-1/4"	63024	63126
7/16"	0.4375	4-5/8"	7-1/4"	63025	63127
29/64"	0.4531	4-3/4"	7-1/2"	63026	63128
15/32"	0.4688	4-3/4"	7-1/2"	63027	63129
31/64"	0.4844	4-3/4"	7-3/4"	63028	63130
1/2"	0.5000	4-3/4"	7-3/4"	63029	63131
33/64"	0.5156	4-3/4"	8"	63030	63132
17/32"	0.5312	4-3/4"	8"	63031	63133
35/64"	0.5469	4-7/8"	8-1/4"	63032	63134
9/16"	0.5625	4-7/8"	8-1/4"	63033	63135
37/64"	0.5781	4-7/8"	8-3/4"	63034	63136
19/32"	0.5938	4-7/8"	8-3/4"	63035	63137
39/64"	0.6094	4-7/8"	8-3/4"	63036	63138
5/8"	0.6250	4-7/8"	8-3/4"	63037	63139
41/64"	0.6406	5-1/8"	9"	63038	63140
21/32"	0.6562	5-1/8"	9"	63039	63141

CONTINUED

LIST CONTINUED
1620

Fractional Sizes
General Purpose, 118° Point

PACKAGING

1/64 to 19/64 — 12 per package
5/16 to 1/2 — 6 per package
33/64 to 11/16 — 1 per package

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO.	
				BRIGHT FINISH	SURFACE TREATED
43/64"	0.6719	5-3/8"	9-1/4"	63040	63142
11/16"	0.6875	5-3/8"	9-1/4"	63055	63143
45/64"	0.7031	5-5/8"	9-1/2"	63056	63144
23/32"	0.7188	5-5/8"	9-1/2"	63057	63145
47/64"	0.7344	5-7/8"	9-3/4"	63058	63146
3/4"	0.7500	5-7/8"	9-3/4"	63059	63147
49/64"	0.7656	6"	9-7/8"	63060	63148
25/32"	0.7812	6"	9-7/8"	63061	63149
51/64"	0.7969	6-1/8"	10"	63062	63150
13/16"	0.8125	6-1/8"	10"	63063	63151
53/64"	0.8281	6-1/8"	10"	63064	63152
27/32"	0.8338	6-1/8"	10"	63065	63153
55/64"	0.8594	6-1/8"	10"	63066	63154
7/8"	0.8750	6-1/8"	10"	63067	63155
57/64"	0.8906	6-1/8"	10"	63068	63156
29/32"	0.9062	6-1/8"	10"	63069	63157
59/64"	0.9219	6-1/8"	10-3/4"	63070	63158
15/16"	0.9375	6-1/8"	10-3/4"	63071	63159
61/64"	0.9531	6-3/8"	11"	63072	63160
31/32"	0.9688	6-3/8"	11"	63073	63161
63/64"	0.9844	6-3/8"	11"	63074	63162
1"	1.0000	6-3/8"	11"	63075	63163
1-1/32"	1.0312	6-1/2"	11-1/8"	63076	63164
1-1/16"	1.0625	6-5/8"	11-1/4"	63077	63165
1-3/32"	1.0938	6-7/8"	11-1/2"	63078	63166
1-1/8"	1.1250	7-1/8"	11-3/4"	63079	63167
1-5/32"	1.1562	7-1/4"	11-7/8"	63080	63168
1-3/16"	1.1875	7-3/8"	12"	63081	63169
1-7/32"	1.2188	7-1/2"	12-1/8"	63082	63170
1-1/4"	1.2500	7-7/8"	12-1/2"	63083	63171
1-9/32"	1.2812	8-1/2"	14-1/8"	63084	63172
1-5/16"	1.3125	8-5/8"	14-1/4"	63085	63173
1-11/32"	1.3438	8-3/4"	14-3/8"	63086	63174
1-3/8"	1.3750	8-7/8"	14-1/2"	63087	63175
1-13/32"	1.4062	9"	14-5/8"	63088	63176
1-7/16"	1.4375	9-1/8"	14-3/4"	63089	63177
1-15/32"	1.4688	9-1/4"	14-7/8"	63090	63178
1-1/2"	1.5000	9-3/8"	15"	63091	63179
1-9/16"	1.5625	9-5/8"	15-1/4"	63092	63180
1-5/8"	1.6250	9-7/8"	15-5/8"	63093	63181
1-3/4"	1.7500	10-1/2"	16-1/4"	63094	63182

LIST
1621

Wire Sizes
General Purpose, 118° Point

PACKAGING

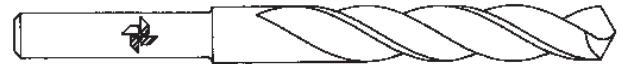
1 to 60 — 12 per package

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO.	
				BRIGHT FINISH	SURFACE TREATED
1	0.2280	3-3/4"	6-1/8"	62700	62747
2	0.2210	3-3/4"	6-1/8"	62701	62748
3	0.2130	3-5/8"	6"	62702	62749
4	0.2090	3-5/8"	6"	62703	62750
5	0.2055	3-5/8"	6"	62704	62751
6	0.2040	3-5/8"	6"	62705	62752
7	0.2010	3-5/8"	6"	62706	62753
8	0.1990	3-5/8"	6"	62707	62754
9	0.1960	3-5/8"	6"	62708	62755
10	0.1935	3-5/8"	6"	62709	62756
11	0.1910	3-5/8"	6"	62710	62757
12	0.1890	3-5/8"	6"	62711	62758
13	0.1850	3-3/8"	5-3/4"	62712	62759
14	0.1820	3-3/8"	5-3/4"	62713	62760
15	0.1800	3-3/8"	5-3/4"	62714	62761
16	0.1770	3-3/8"	5-3/4"	62715	62762
17	0.1730	3-3/8"	5-3/4"	62716	62763
18	0.1695	3-3/8"	5-3/4"	62717	62764
19	0.1660	3-3/8"	5-3/4"	62718	62765
20	0.1610	3-3/8"	5-3/4"	62719	62766
21	0.1590	3-3/8"	5-3/4"	62720	62767
22	0.1570	3-3/8"	5-3/4"	62721	62768
23	0.1540	3"	5-3/8"	62722	62769
24	0.1520	3"	5-3/8"	62723	62770
25	0.1495	3"	5-3/8"	62724	62771
26	0.1470	3"	5-3/8"	62725	62772
27	0.1440	3"	5-3/8"	62726	62773
28	0.1405	3"	5-3/8"	62727	62774
29	0.1360	3"	5-3/8"	62728	62775
30	0.1285	3"	5-3/8"	62729	62776
31	0.1200	2-3/4"	5-1/8"	62737	62777
32	0.1160	2-3/4"	5-1/8"	62738	62778
33	0.1130	2-3/4"	5-1/8"	62739	62779
34	0.1110	2-3/4"	5-1/8"	62740	62780
35	0.1100	2-3/4"	5-1/8"	62741	62781
36	0.1065	2-1/2"	4-5/8"	62742	62782
37	0.1040	2-1/2"	4-5/8"	62743	62783
38	0.1015	2-1/2"	4-5/8"	62744	62784
39	0.0995	2-1/2"	4-5/8"	62745	62785
40	0.0980	2-1/2"	4-5/8"	62746	62786

1/2" ROUND SHANK S & D DRILL, REDUCED SHANK DRILL High Speed Steel, 118° Point, Surface Treated

GENERAL FEATURES AND APPLICATIONS

For use in a 1/2" diameter portable drill chuck. Precision ground for a high degree of concentricity between the shank and body diameter. Ideal for drilling in low and medium tensile materials. Common flute and overall lengths allow for minimal adjustment during tool change.



**LIST
1618**

Fractional Sizes 1/2" Shank Diameter, 3" Flute Length, 6" Overall Length

PACKAGING

33/64 to 1-1/2 — 1 per package

DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO. SURFACE TREATED	DIA. SIZE	DEC. EQUIV.	FLUTE LENGTH	OVERALL LENGTH	EDP NO. SURFACE TREATED
33/64	.5156	3	6	68900	55/64	.8594	3	6	68922
17/32	.5312	3	6	68901	7/8	.8750	3	6	68923
35/64	.5469	3	6	68902	57/64	.8906	3	6	68924
9/16	.5625	3	6	68903	29/32	.9062	3	6	68925
37/64	.5781	3	6	68904	59/64	.9219	3	6	68926
19/32	.5938	3	6	68905	15/16	.9375	3	6	68927
39/64	.6094	3	6	68906	61/64	.9531	3	6	68928
5/8	.6250	3	6	68907	31/32	.9688	3	6	68929
41/64	.6406	3	6	68908	63/64	.9844	3	6	68930
21/32	.6562	3	6	68909	1	1.0000	3	6	68931
43/64	.6719	3	6	68910	1-1/32	1.0312	3	6	68932
11/16	.6875	3	6	68911	1-1/16	1.0625	3	6	68933
45/64	.7031	3	6	68912	1-3/32	1.0938	3	6	68934
23/32	.7188	3	6	68913	1-1/8	1.1250	3	6	68935
47/64	.7344	3	6	68914	1-5/32	1.1562	3	6	68936
3/4	.7500	3	6	68915	1-3/16	1.1875	3	6	68937
49/64	.7656	3	6	68916	1-7/32	1.2188	3	6	68938
25/32	.7812	3	6	68917	1-1/4	1.2500	3	6	68939
51/64	.7969	3	6	68918	1-5/16	1.3125	3	6	68940
13/16	.8125	3	6	68919	1-3/8	1.3750	3	6	68941
53/64	.8281	3	6	68920	1-7/16	1.4375	3	6	68942
27/32	.8438	3	6	68921	1-1/2	1.5000	3	6	68943

118° JOBBERS LENGTH, GENERAL PURPOSE, HIGH SPEED STEEL

**LIST
1619****29 piece set in metal box**

Fractional Sizes, 1/16–1/2" by 64ths

HIGH SPEED STEEL

Surface Treated, Set EDP No. 62914

Bright Finish, Set EDP No. 62913

60 piece set in metal index

Wire Sizes, 1–60

HIGH SPEED STEEL

Surface Treated, Set EDP No. 62915

Bright Finish, Set EDP No. 62917

115 piece sets in metal indexes

Fractional, 1/16–1/2" by 64ths; Wire, 1–60; Letter, A–Z

HIGH SPEED STEEL

Surface Treated, Set EDP No. 62916

Bright Finish, Set EDP No. 62910



118° METRIC JOBBERS LENGTH, GENERAL PURPOSE, HIGH SPEED STEEL

**LIST
1619****25 piece set in metal box**

Metric Sizes, 1mm–13mm by .5mm

HIGH SPEED STEEL

Surface Treated, Set EDP No. 62937



135° MEDIUM DUTY, JOBBERS LENGTH, HIGH SPEED STEEL

**13 piece set**

Fractional, 1/16"–1/4" by 64ths

HIGH SPEED STEEL

Surface Treated, Set EDP No. 62900

15 piece set

Fractional, 3/64"–1/2" by 32ths

HIGH SPEED STEEL

Surface Treated, Set EDP No. 62901

29 piece set

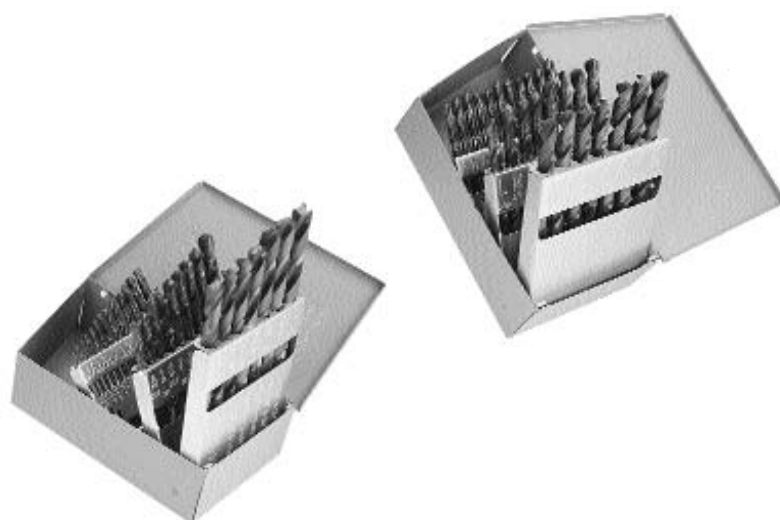
Fractional, 1/16"–1/2" by 64ths

HIGH SPEED STEEL

Surface Treated, Set EDP No. 62903

**LIST
1619**

135° HEAVY DUTY, JOBBERS LENGTH, COBALT HIGH SPEED STEEL

**26 piece set**

Letter, A–Z

COBALT HIGH SPEED STEEL

Straw Finish, Set EDP No. 62902

29 piece set

Fractional, 1/16"–1/2" by 64ths

COBALT HIGH SPEED STEEL

Straw Finish, Set EDP No. 62921

60 piece set

Wire, 1–60

COBALT HIGH SPEED STEEL

Straw Finish, Set EDP No. 62925

115 piece set

Fractional, 1/16"–1/2" by 64ths; Wire, 1–60; Letter, A–Z

COBALT HIGH SPEED STEEL

Straw Finish, Set EDP No. 62923

**LIST
1619**

118° GENERAL PURPOSE, SCREW MACHINE LENGTH, HIGH SPEED STEEL

LIST 1619 29 piece set in metal index

Fractional Sizes, 1/16"–1/2" by 48ths

HIGH SPEED STEEL

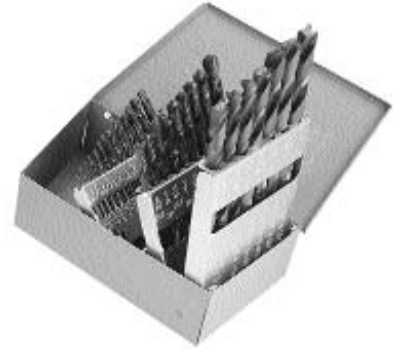
Bright Finish, Set EDP No. 62927

60 piece set in metal index

Wire Sizes, 1–60

HIGH SPEED STEEL

Bright Finish, Set EDP No. 62928



135° MEDIUM DUTY, SCREW MACHINE LENGTH, HIGH SPEED STEEL

LIST 1619 29 piece set in metal index

Fractional, 1/16"–1/2" by 64ths

HIGH SPEED STEEL

Surface Treated, Set EDP No. 62934

TiN Coated, Set EDP No. 62939



135° HEAVY DUTY, SCREW MACHINE LENGTH, COBALT HIGH SPEED STEEL

LIST 1619 29 piece set in metal index

Fractional, 1/16"–1/2" by 64ths

COBALT HIGH SPEED STEEL

Straw Finish, Set EDP No. 62931

60 piece set in metal index

Wire Sizes, 1–60

COBALT HIGH SPEED STEEL

Straw Finish, Set EDP No. 62932



118° 1/2" REDUCED SHANK, HIGH SPEED STEEL

**8 piece set in metal box**

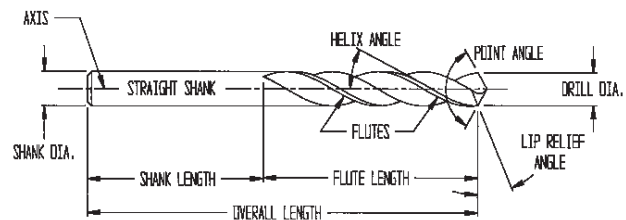
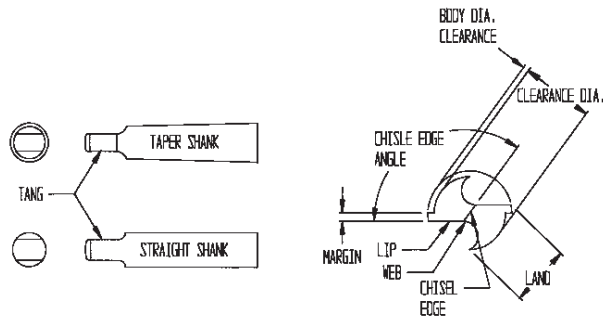
Fractional Sizes, 9/16–1" by 16ths

HIGH SPEED STEEL

Surface Treated, Set EDP No. 62924

**LIST
1619**

DRILL NOMENCLATURE



Axis – The imaginary straight line which forms the longitudinal center line of the drill.

Back Taper – A slight decrease in diameter from front to back in the body of the drill.

Body – The portion of the drill extending from the shank or neck to the outer corners of the cutting lips.

Body Diameter Clearance – That portion of the land that has been cut away so it will not rub against the walls of the hole.

Chisel Edge – The edge at the end of the web that connects the cutting lips.

Chisel Edge Angle – The angle included between the chisel edge and the cutting lip, as viewed from the end of the drill.

Clearance – The space provided to eliminate undesirable contact between the drill and the workpiece.

Clearance Diameter – The diameter over the cut away portion of the drill lands.

Drill Diameter – The diameter over the margins of the drill measured at the point.

Flutes – Helical or straight grooves in the body of the drill to provide cutting lips, permit removal of chips and allow coolant to reach the cutting lips.

Flute Length – The length from the outer corners of the cutting lips to the extreme back end of the flutes.

Helix Angle – The angle made by the leading edge of the land with a plane containing the axis of the drill.

Land – the peripheral portion of the body between adjacent flutes.

Land Width – The distance between the leading edge and the heel of the land measured at a right angle to the leading edge.

Lead – The axial advance of the leading edge of the land in one turn around the circumference.

Lips – The cutting edges of a two-flute drill extending from the chisel edge to the periphery.

Lip Relief – The axial relief angle at the outer corner of the lip. It is measured by projection into a plane, tangent to the periphery, at the outer corner of the lip.

Margin – The cylindrical portion of the land which is not cut away to provide clearance.

Overall Length – The length from the extreme end of the shank to the outer corners of the cutting lips. It does not include the conical shank end, often used on straight shank drills, or the conical cutting point.

Point – The cutting end of a drill, made up of the ends of the lands and the web. In form it resembles a cone but departs from a true cone to furnish clearance behind the cutting lips.

Point Angle – The angle included between the cutting lips, projected upon a plane parallel to the drill axis and parallel to the two cutting lips.

Relative Lip Height – The difference in indicator reading between the cutting lips of the drill. It is measured at a right angle to the cutting lip at a specific distance from the axis of the drill.

Relief – The result of the removal of tool material behind the cutting lip and leading edge of the land to provide clearance and prevent rubbing.

Web – The central portion of the body that joins the lands. The extreme end of the web forms the chisel edge on a two-flute drill.

Web Thickness – The thickness of the web at the point, unless another specific location is specified.

Web Thinning – The operation of reducing the web thickness, at the point, to reduce drilling thrust.

SPEEDS FOR DRILLING

MATERIAL BEING DRILLED	CUTTING SPEED (SFM)	POINT STYLE	POINT ANGLE (DEGREES)	FEED RATE
Aluminum Alloys	200-300	Conventional	118	Medium to Heavy
Magnesium Alloys	200-300	Conventional	118	Medium to Heavy
Brass and Bronze	75-150	Conventional	118	Medium to Heavy
Cast Iron				
Soft	75-125	Conv. or Split	118 or 135	Medium to Heavy
Medium Hard	50-100	Conv. or Split	118 or 135	Medium
Hard Chilled	10-20	Conventional	118	Light to Medium
Malleable	75-125	Conv. or Split	118 or 135	Medium
Steel				
Mild, .2 to .3 Carbon	50-100	Conventional	118	Medium to Heavy
Medium, .4 to .5 Carbon	45-80	Conventional	118	Medium
Tool, 1.2 Carbon	40-60	Conventional	118	Medium
Forgings	40-60	Conventional	118	Medium
Alloy, 300 to 400 BHN	20-30	Conv. or Split	118 or 135	Medium
High Tensile				
Rc 35-40	30-40	Conv. or Split	118 or 135	Medium
Rc 40-45	25-35	Conv. or Split	118 or 135	Medium
Rc 45-50	15-25	Conv. or Split	118 or 135	Light to Medium
Rc 50-55	7-15	Conv. or Split	118 or 135	Light to Medium
Maraging, Heat Treated	7-20	Conv. or Split	118 or 135	Medium
Maraging, Annealed	40-55	Conv. or Split	118 or 135	Light to Medium
Titanium Alloys				
Commercially Pure	50-60	Heavy Duty Split	135	Medium
5Al-2Sn, 8Al-1 Mo-1V	20-45	Heavy Duty Split	135	Medium
2Fe-2Cr-Mo Annealed				
6Al-4V, 4Al-4Mn, 7Al-4Mo	20-35	Heavy Duty Split	135	Medium
5Al-2Sn, 8Al-1Mo-1V	15-20	Heavy Duty Split	135	Medium
2Fe-2Cr-Mo Solution Treated and Aged				
High Temperature Alloys				
Cobalt Base, HS25, S816, V36	7-20	Heavy Duty Split	135	Medium
INCO 800, A286, N155	7-20	Heavy Duty Split	135	Medium
Nickel Base, Inconel 700, U500, Rene 41	5-15	Heavy Duty Split	135	Medium
Monel Metal	30-50	Heavy Duty Split	135	Medium
Stainless Steel				
Free Machining, 303, 416, 420	30-100	Heavy Duty Split	135	Medium
Austenitic, 300 Series	20-60	Heavy Duty Split	135	Medium
Ferritic, 400 Series	20-60	Heavy Duty Split	135	Medium
Martensitic, Heat Treated	10-30	Heavy Duty Split	135	Medium
Plastics and Related Materials	100-200	Low Angle	90	Medium to Heavy
Zinc Alloys	150-250	Conventional	118	Medium to Heavy

The speeds shown are for average conditions where coolant can be efficiently applied. Where the strength of the drill is not a critical factor and where the workpiece can be rigidly supported. When one or more of these conditions vary, the speeds must be adjusted accordingly.

FEED RATE PER REVOLUTION FOR DRILLS

DRILL DIAMETER RANGE	FEED PER REVOLUTION		
	LIGHT	MEDIUM	HEAVY
1/16 Thru 1/8	.0005-.0010	.0010-.0020	.0020-.0030
Over 1/8 Thru 1/4	.0010-.0030	.0030-.0050	.0050-.0070
Over 1/4 Thru 1/2	.0030-.0050	.0050-.0070	.0070-.0090
Over 1/2 Thru 3/4	.0050-.0080	.0080-.0110	.0110-.0140
Over 3/4 Thru 1	.0080-.0110	.0110-.0140	.0140-.0170
Over 1	.0120-.0150	.0150-.0200	.0200-.0250

The feed rates shown are for average conditions where coolant can be efficiently applied, where the strength of the drill is not a critical factor and where the workpiece can be rigidly supported. When one or more of these conditions vary; the feeds must be adjusted accordingly.

SPEEDS AND FEEDS FOR DEEP HOLE DRILLING

Holes which must be drilled three or more diameters deep fall into the "Deep Hole" drilling class and some adjustment of speeds and feeds is necessary.

The deeper the hole, the greater the tendency for chip to pack and clog the flutes of the drill. This increases the amount of heat generated and prevents coolant from reaching the drill points. Heat buildup will eventually result in premature failure.

Step drilling, that is, drilling a short distance and then retracting the drill, will often reduce the chip packing. The deeper the hole the more often the drill must be retracted.

A reduction in speed and feed to reduce the amount of heat generated is generally required in most deep-hole applications where coolant cannot be effectively applied.

SPEED AND FEED REDUCTION PERCENTAGES FOR DEEP HOLE DRILLING

HOLE DEPTH	REDUCE SPEED BY	REDUCE FEED BY
3 x Drill Diameter	10%	10%
4 x Drill Diameter	20%	10%
5 x Drill Diameter	30%	20%
6 x Drill Diameter	40%	20%

SPEED CALCULATIONS FOR DRILLING

Surface Feet Per Minute (SFM) = .26 X RPM X Drill Diameter

Revolutions Per Minute (RPM) = $\frac{\text{SFM}}{\text{Drill Diameter}}$

TROUBLESHOOTING GUIDE FOR DRILLS

PROBLEM	PROBABLE CAUSES
Corners break down.	Cutting speed too high. Hard spots in material. Insufficient coolant at drill point. Flutes clogged with chips.
Cutting lips chip.	Too much feed. Lip relief too great.
Margin chips.	Oversize drill bushing.
Drill breaks.	Point improperly ground. Too much feed. Drill is dull. Flutes clogged with chips.
Tang breaks.	Imperfect fit between taper shank and socket caused by dirt or chips. Socket is burred or badly worn.
Drill splits up center.	Not enough lip relief. Too much feed.
Drill will not enter work.	Drill is dull. Not enough lip relief. Web is too heavy.
Surface of hole is rough.	Point improperly ground or dull. Insufficient coolant at drill point. Too much feed. Workholding device not rigid.
Hole is oversize.	Unequal point angles. Unequal length of cutting edges. Machine spindle bearings may be worn.
Chip shape changes while drilling.	Drill is dull. Cutting lips are chipped.
Large chip coming out of one flute, small chip coming out of the other.	Point is improperly ground and one lip is doing all of the cutting.

SURFACE TREATMENTS AND COATINGS

CODE NO.	DESCRIPTION	CHARACTERISTICS	APPLICATION
02	Nitride Approx. Hardness 1200 HV Rc 72	Consists of a thin, hardened case .0005 to .002 deep on the surface of the tool to resist abrasion and reduce galling.	Can be used in most Abrasive Materials, both Ferrous and Non-Ferrous. Not recommended where chipping may be a problem.
22	Double Nitride Approx. Hardness 1400 HV Rc 74	Consists of a higher hardened case on the surface of the tool to resist abrasion and reduce galling. Prone to brittleness and chipping.	Can be used on Non-Metallic, Highly Abrasive Materials such as Bakelite, Plastics, Hard Rubber and Fibers.
03	Steam Oxide Approx. Hardness No change from Base Material	Consists of a layer of ferrous oxide on the surface of the tool which has good lubricant retaining properties. Improves toughness by relieving grinding stresses.	Can be used in Low Carbon, Stainless and Free Machining Steels. Not recommended for use in soft, Non-Ferrous Materials where it may cause galling.
23	Nitride and Oxide Approx. Hardness 1200 HV Rc 72	A combination of two treatments which produces the favorable characteristics of both, resistance to abrasion and galling.	Can be used in Iron and Cast Iron, Stainless and High Tensile Steels. Not recommended for use in Non-Ferrous Materials where it may cause galling.
04	Chrome Plate Cr, Hard Chromium Approx. Hardness 1200 HV Rc 72	Consists of a very thin layer of hard chromium on the surface of the tool which reduces friction and prevents galling.	Can be used on most Ferrous, Non-Ferrous and Non-Metallic Materials. While unlikely, it may cause galling in High Chromium Stainless Steels.
88	Titanium Nitride TiN, PVD Process Approx. Hardness 2400 HV *Rc 86	Consists of a very hard coating on the surface of the tool which has outstanding wear resistance, reduces friction and prevents galling.	Can be used on most Ferrous, Non-Ferrous and Non-Metallic Materials. While unlikely, it may cause galling in Titanium and Titanium Alloys.
89	Titanium Carbonitride TiCN, PVD Process Approx. Hardness 3000 HV *Rc 94	Consists of an extremely hard coating on the surface of the tool which has outstanding wear resistance, reduces friction and prevents galling.	Can be used on most Ferrous, Non-Ferrous and Abrasive Materials. Very effective at higher Speeds. While unlikely, it may cause galling in Titanium and Titanium Alloys.
90	Chromium Carbide CrC, PVD Process Approx. Hardness 1850 HV Rc 80	Consists of a very hard coating on the surface of the tool which has excellent wear resistance, reduces friction and prevents galling.	Can be used on Titanium, Titanium Alloys, Exotic Materials and Die Cast Aluminum. Very effective at higher speeds and in many tapping applications. Under certain conditions it may cause galling in Wrought Aluminum.
82	Chromium Nitride CrN, PVD Process Approx. Hardness 1750 HV Rc 79	Consists of a very hard coating on the surface of the tool which has excellent wear resistance, reduces friction and prevents galling.	Can be used on Titanium, Titanium Alloys, Nickel-Base Alloys and Copper Alloys. Very effective at higher speeds and in many tapping applications. Under certain conditions it may cause galling in Wrought Aluminum.
84	Titanium Aluminum Nitride TiAlN, PVD Process Approx. Hardness 2600 HV *RC 89	Consists of an extremely hard coating on the surface of the tool which has outstanding wear resistance, reduces friction and prevents galling. Forms an Aluminum Oxide layer at high speeds and elevated temperatures.	Can be used on Titanium, Titanium Alloys, Nickel-Base Alloys, Stainless Steel and Cast Iron. Very effective at higher speeds and in some tapping applications. Not recommended for Wrought Aluminum, Copper and Brass.

* Theoretical values for approximate comparison to the Vickers Hardness values.

NOTE: While most surface treatments and coatings have anti-galling properties, they may cause galling in materials composed of or containing identical base elements. Also, Steam Oxide and some coatings may cause galling in soft materials such as Aluminum.

TAP DRILL SIZES FOR UNIFIED INCH SCREW THREAD

TAP SIZE	TAP DRILL SIZE	DECIMAL EQUIV. OF TAP DRILL (INCHES)	PROBABLE PERCENT OF THREAD ENGMT.	TAP SIZE	TAP DRILL SIZE	DECIMAL EQUIV. OF TAP DRILL (INCHES)	PROBABLE PERCENT OF THREAD ENGMT.	TAP SIZE	TAP DRILL SIZE	DECIMAL EQUIV. OF TAP DRILL (INCHES)	PROBABLE PERCENT OF THREAD ENGMT.
0-80	56	.0465	74	10-32	5/32	.1563	78	5/8-18	9/16	.2525	82
	3/64	.0469	72		22	.1570	77		14.5mm	.5709	70
	1.25mm	.0492	57		21	.1590	72		37/64	.5781	60
1-64	54	.0550	81	12-24	11/64	.1719	78	3/4-10	41/64	.6406	81
	1.45mm	.0571	71		17	.1730	76		21/32	.6563	69
	53	.0595	59		16	.1770	68		17.0mm	.6693	59
1-72	1.5mm	.0591	69	12-28	16	.1770	80	3/4-16	11/16	.6875	72
	53	.0595	66		15	.1800	73		17.5mm	.6890	70
	1.55mm	.0610	58		14	.1820	69		17.7mm	.6969	60
2-56	51	.0670	75	1/4-20	9	.1960	80	7/8-9	49/64	.7656	73
	1.75mm	.0689	67		7	.2010	72		19.7mm	.7756	66
	50	.0700	62		13/64	.2031	69		25/32	.7813	62
2-64	50	.0700	71	1/4-28	5.4mm	.2126	76	7/8-14	51/64	.7969	79
	1.8mm	.0709	67		3	.2130	75		20.5mm	.8071	68
	49	.0730	56		5.5mm	.2165	67		13/16	.8125	62
3-48	48	.0760	79	5/16-18	F	.2570	74	1-8	55/64	.8594	84
	5/64	.0781	71		6.6mm	.2598	70		7/8	.875	74
	46	.0810	60		G	.2610	68		57/64	.8906	64
3-56	46	.0810	71	5/16-24	H	.2660	82	1-12	29/32	.9063	82
	45	.0820	66		6.8mm	.2677	78		59/64	.9219	68
	2.1mm	.0827	63		I	.2720	70		23.5mm	.9252	65
4-40	44	.0860	75	3/8-16	7.8mm	.3071	81	1-14	59/64	.9219	79
	43	.0890	66		5/16	.3125	74		23.5mm	.9252	75
	2.3mm	.0906	61		0	.3160	69		15/16	.9375	62
4-48	2.3mm	.0906	73	3/8-24	8.4mm	.3307	77	1-1/8-7	31/32	.9688	81
	42	.0935	62		Q	.3320	75		63/64	.9844	73
	2.4mm	.0945	58		8.5mm	.3346	70		1	1.0000	65
5-40	39	.0995	73	7/16-14	23/64	.3594	81	1-1/8-12	1-1/32	1.0313	82
	38	.1015	67		9.3mm	.3661	74		26.4mm	1.0394	74
	2.6mm	.1024	64		9.4mm	.3701	70		1-3/64	1.0469	67
5-44	38	.1015	74	7/16-20	W	.3860	75	1-1/4-7	1-3/32	1.0938	81
	2.6mm	.1024	71		25/64	.3906	68		1-7/64	1.1094	73
	37	.1040	65		10.0mm	.3937	63		1-1/8	1.1250	64
6-32	36	.1065	73	1/2-13	10.5mm	.4134	84	1-1/4-12	1-5/32	1.1563	81
	7/64	.1095	66		27/64	.4219	75		29.5mm	1.1614	76
	34	.1110	62		11.0mm	.4331	64		1-11/64	1.1719	67
6-40	33	.1130	72	1/2-20	11.4mm	.4488	74	1-3/8-6	1-13/64	1.2031	77
	2.9mm	.1142	68		29/64	.4531	67		1-7/32	1.2188	69
	32	.1160	62		11.6mm	.4567	62		1-15/64	1.2344	62
8-32	3.4mm	.1339	70	9/16-12	15/32	.4688	84	1-3/8-12	1-9/32	1.2813	81
	29	.1360	64		31/64	.4844	69		1-19/64	1.2969	66
	3.5mm	.1378	60		12.5mm	.4921	62		33.0mm	1.2992	64
8-36	29	.1360	72	9/16-18	1/2	.5000	82	1-1/2-6	1-21/64	1.3281	76
	3.5mm	.1378	67		13.0mm	.5118	66		1-11/32	1.3438	69
	9/64	.1406	60		33/64	.5156	60		1-23/64	1.3594	62
10-24	3.7mm	.1457	78	5/8-11	17/32	.5313	76	1-1/2-12	1-13/32	1.4063	80
	25	.1495	71		13.7mm	.5394	70		1-27/64	1.4219	66
	24	.1520	67		35/64	.5469	63				

The percent of thread engagement in this table is based upon the probable hole size the drill will cut. The actual hole size may vary as a result of the condition of the drill, machine and material being drilled. The actual percent of thread engagement may be determined by pin gaging the hole.

TAP DRILL SIZES FOR METRIC SCREW THREADS

TAP SIZE	TAP DRILL SIZE	DECIMAL EQUIV. OF TAP DRILL (INCHES)	PROBABLE PERCENT OF THREAD ENGMT.	TAP SIZE	TAP DRILL SIZE	DECIMAL EQUIV. OF TAP DRILL (INCHES)	PROBABLE PERCENT OF THREAD ENGMT.	TAP SIZE	TAP DRILL SIZE	DECIMAL EQUIV. OF TAP DRILL (INCHES)	PROBABLE PERCENT OF THREAD ENGMT.
M1.6x.35	1.22mm	.0480	75	M8x1.25	17/64	.2656	74	M18x2.5	39/64	.6094	75
	1.25mm	.0492	69		I	.2720	64		15.7mm	.6181	68
	1.28mm	.0504	62		7.0mm	.2756	58		5/8	.6250	63
M2x.4	1.57mm	.0618	75	M10x1.25	11/32	.3438	74	M20x1.5	18.5mm	.7283	72
	1/16	.0625	72		S	.3480	67		47/64	.7344	64
	52	.0635	67		9.0mm	.3543	57		18.7mm	.7362	61
M2.5x.45	2.02mm	.0795	75	M10x1.5	Q	.3320	77	M20x2.5	11/16	.6875	75
	45	.0820	64		R	.3390	68		45/64	.7031	63
	2.11mm	.0831	60		11/32	.3438	62		18.0mm	.7087	58
M3x.5	40	.0980	72	M12x1.25	27/64	.4219	74	M24x2	22.0mm	.8661	72
	39	.0995	66		10.9mm	.4291	63		7/8	.875	64
	38	.1015	58		11.0mm	.4331	57		22.4mm	.8819	57
M3.5x.6	33	.1130	75	M12x1.75	Y	.4040	73	M24x3	53/64	.8281	73
	32	.1160	65		13/32	.4062	71		27/32	.8438	63
	3.0mm	.1181	58		Z	.4130	63		21.5mm	.8465	61
M4x.7	30	.1285	76	M14x1.5	12.5mm	.4921	73	M27x3	24.0mm	.9449	74
	3.3mm	.1299	72		1/2	.5000	62		61/64	.9531	68
	3.4mm	.1339	61		12.8mm	.5039	57		31/32	.9688	58
M4.5x.75	26	.1470	74	M14x2	15/32	.4688	78	M30x3.5	1-3/64	1.0469	72
	25	.1495	67		12.1mm	.4764	70		1-1/16	1.0625	63
	24	.1520	61		31/64	.4844	62		1-5/64	1.0781	54
M5x.8	19	.1660	71	M16x1.5	14.5mm	.5709	72	M33x3.5	29.5mm	1.1614	74
	18	.1695	62		37/64	.5781	63		1-11/64	1.1719	68
	11/64	.1719	56		14.8mm	.5827	57		1-3/16	1.1875	59
M6x1	9	.1960	75	M16x2	35/64	.5469	78	M36x4	1-17/64	1.2656	71
	8	.1990	69		14.1mm	.5551	70		1-9/32	1.2813	63
	7	.2010	65		9/16	.5625	62		33.0mm	1.2992	55
M7x1	15/64	.2344	76	M18x1.5	16.5mm	.6496	72				
	B	.2380	69		16.6mm	.6535	67				
	C	.2420	61		21/32	.6563	63				

The percent of thread engagement in this table is based upon the probable hole size the drill will cut. The actual hole size may vary as a result of the condition of the drill, machine and material being drilled. The actual percent of thread engagement may be determined by pin gaging the hole.

HARDNESS CONVERSION TABLE

ROCKWELL HARDNESS			BRINELL HARDNESS	TENSILE STRENGTH (PSI)
C	B	A		
70	-	86.6	-	-
69	-	86.1	-	-
68	-	85.6	-	-
67	-	85.0	-	-
66	-	84.5	-	-
65	-	83.9	-	-
64	-	83.4	-	-
63	-	82.8	-	-
62	-	82.3	-	-
61	-	81.8	-	-
50	-	81.2	-	314,000
59	-	80.7	-	306,000
58	-	80.1	-	299,000
57	-	79.6	-	291,000
56	-	79.0	-	284,000
55	-	78.5	-	277,000
54	-	78.0	-	270,000
53	-	77.4	-	263,000
52	-	76.8	500	256,000
51	-	76.3	487	250,000
50	-	75.9	475	243,000
49	-	75.2	464	236,000
48	-	74.7	451	230,000
47	-	74.1	442	223,000
46	-	73.6	432	217,000
45	-	73.1	421	211,000
44	-	72.5	409	205,000
43	-	72.0	400	199,000

ROCKWELL HARDNESS			BRINELL HARDNESS	TENSILE STRENGTH (PSI)
C	B	A		
42	-	71.5	390	194,000
41	-	70.9	381	188,000
40	-	70.4	371	182,000
39	-	69.9	362	176,000
38	-	69.4	353	171,000
37	-	68.9	344	166,000
36	-	68.4	336	162,000
35	-	67.9	327	157,000
34	-	67.4	319	153,000
33	-	66.8	311	149,000
32	-	66.3	301	144,000
31	106.0	65.8	294	140,000
30	105.5	65.3	286	136,000
29	104.5	64.7	279	132,000
28	104.0	64.3	271	129,000
27	103.0	63.8	264	126,000
26	102.5	63.3	271	123,000
25	101.5	62.8	253	120,000
24	101.0	62.4	247	117,000
23	100.0	62.0	243	114,000
22	99.0	61.5	237	112,000
21	98.5	61.0	231	110,000
20	98.0	60.5	226	108,000
17	96.0	59.0	215	-
15	94.0	57.5	204	-
12	92.0	56.5	194	-
9	90.0	55.0	184	-





drills



BRUBAKER TOOL™

200 Front Street, Millersburg, PA 17061
Phone: 717-692-2113, 1-800-522-8665, Fax: 717-692-4995
E-Mail: www.brubakertool.com