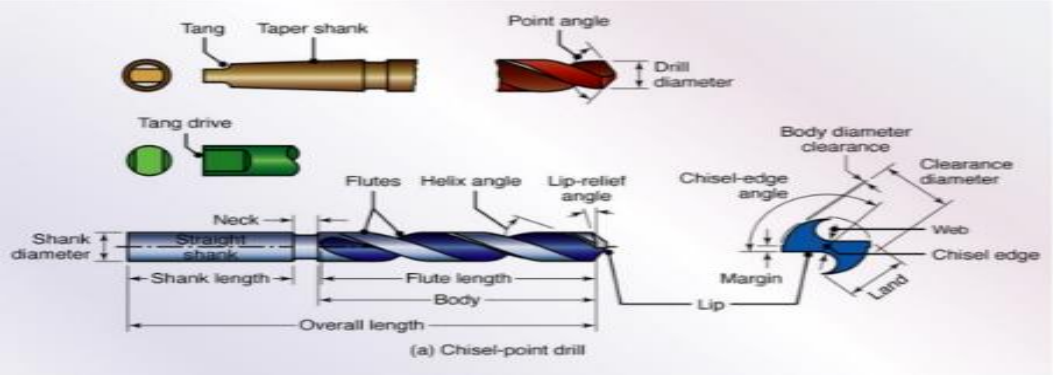
Twist Drills

Nomenclature



- Parallel Shank Twist Drills (ISS) - Jobber Series
- Parallel Shank Twist Drills (BSS) - Jobbers Series
- HSS Parallel Shank Twist Drills - Stub Series
- HSS Parallel Shank Twist Drills - Long Series
- HSS Parallel Shank Twist Drills - Ex. Long Series
- Parallel Shank Twist Drills - Reduced Shank
- Silver & Deming Drills
- Taper Shank Twist Drills
- Taper Shank Twist Drills - Long & Extra Long Series
- Taper Shank Core Drills
- SubLand Parallel Shank
- Subland Taper Shank

Drill Feed & Speeds

Different drilling conditions make it impossible to develop any rigid rules for feeds and speeds. The following tables contain guidelines which can be utilized when drilling standard materials. Also, the following " rules of thumb" can be used to determine proper feeds and speeds for drilling ferrous materials (note: varying conditions can easily require adjustments).

Feed equals .001" per revolution for every 1/16" of drill diameter, plus or minus .001" on the total.

Speed equals 80 surface feet per minute in 100 Brinell hardness material and the speed should be reduced 10 surface feet per minute for each additional 50 points Brinell hardness.

Feed and speed rates should be reduced up to 45-50 % when drilling holes deeper than 4 drill diameters.

Recommended Feeds

RECOMMENDED FEEDS FOR VARIOUS DIAMETER DRILLS

Diameter of Drill—Inches	Feed Inches per Revolution
Under 1/8	.001 to .003
1/8 to 1/4	.002 to .006
1/4 to 1/2	.004 to .010
1/2 to 1	.007 to .015
1 inch and over	.015 to .025

NOTE: It is best to start with a moderate speed and feed, increasing either one, or both, after observing the action and condition of the drill.

RECOMMENDED SPEEDS FOR STANDARD MATERIALS WITH H.S.S. DRILLS

Material	Recommended Speed (sfm)
Aluminum and its Alloys	200—300
Brass and Bronze (ordinary)	150—300
Bronze (High Tensile)	70—150
Die Castings (Zinc Base)	300—400
Iron—Cast (soft)	75—125
Cast (medium hard)	50—100
Hard Chilled	10—20
Malleable	80—90
Magnesium and its Alloys	250—400
Monel Metal or High-Nickel Steel	30—50
Plastics or Similar Materials	100—300
Steel—	
Mild .2 carbon to .3 carbon	80—110
Steel .4 carbon to .5 carbon	70—80
Tool 1.2 carbon	50—60
Forgings	40—50
Alloy—300 to 400 Brinell	20—30
High Tensile (Heat Treated)	
35 to 40 Rockwell "C"	30—40
40 to 45 Rockwell "C"	25—35
45 to 50 Rockwell "C"	15—25
50 to 55 Rockwell "C"	7—15
Stainless Steel	
Free Machining Grades	30—80
Work Hardening Grades	15—50
Titanium Alloy Sheet	50—60
Titanium Alloys	
Ti-75A (Commercially Pure)	50—60
RS-120	40—60
Ti-150A	40—50
Ti-140A	30—40
RC-130B	30—40
MST 6A1-4 Va.	20—35
MST 3A1-5 Cr.	10—20

Formulas

1. **R.P.M.** = (3.8197 / Drill Diameter) x S.F.M.
2. **S.F.M.** = 0.2618 x Drill Diameter x R.P.M.
3. **I.P.M.** = I.P.R. (feed) x R.P.M. (speed)
4. Machine Time (seconds) = (60 x Feed minus Stroke) / I.P.M.

R.P.M. = Revolutions Per Minute
S.F.M. = Surface Feet Per Minute
I.P.M. = Inches Per Minute
I.P.R. = Inches Per Revolution
Feed Stroke = Drill Depth + 1/3
Car Reamer = 1/2 Speed of Drill

Cutting Speed

DRILL SIZE	CUTTING SPEED — FEET PER MINUTE 20	40	60	80	100
	REVOLUTIONS	PER	MINUTE		(000)
1/64	4.89	9.78	14.78	19.72	24.45
1/16	1.22	2.44	3.70	4.93	6.11
1/8	.61	1.22	1.83	2.44	3.06
3/16	.41	.82	1.23	1.63	2.04
1/4	.30	.61	.92	1.22	1.53
5/16	.24	.49	.74	.98	1.22
3/8	.20	.41	.61	.81	1.02
7/16	.18	.35	.52	.70	.87
1/2	.15	.31	.46	.61	.76
9/16	.14	.27	.41	.54	.68
5/8	.12	.24	.37	.49	.61
11/16	.11	.22	.34	.45	.56
3/4	.10	.20	.31	.41	.51
13/16	.09	.19	.28	.38	.47
7/8	.09	.18	.26	.35	.44
15/16	.08	.16	.25	.33	.41
1	.08	.15	.23	.30	.38

PROBLEM	CAUSE	CORRECTION
BROKEN DRILL	1. Flutes clogged with chips, drill binds in hole (common in deep holes)	—Use drill with wider flutes and/or faster helix angle —Consider polished flutes —Withdraw drill at regular intervals to clear chips —If chips are not broken up, consider heavier feeds—or a chip breaker design
	2. Drill binding due to worn outer corners	—Repoint or replace drill —Check for excessive speed, inadequate or incorrect coolant, excessive run out as drill enters work
	3. Work insecurely held	—Use adequate holding or clamping devicen
	4. Excessive feed	—Reduce feed
	5. Improper point	—Check for correct lip clearance —Use proper type of drill and point for the application
	6. Drill is dull	—Replace before dulling occurs. Check feeds, speeds, and No. 5 for premature dulling
BROKEN TANG	1. Shank or socket damaged	—Repair or replace
	2. Drill not properly seated in socket	—Check for positive, secure fit
CHIPS NOT BREAKING UP	1. Insufficient feed	—Increase feed
	2. Improper style of drill and/or point	—Consider use of chip-breaker design drill and/or chip-breaker point grind
DAMAGED POINT	1. Using hard object to tap drill into socket	—Use soft lead, brass, plastic, etc. hammer
	2. Dropping, mishandling drill	—Handle with care
OVERSIZE HOLE	1. Drill point off center	—Repoint accurately or replace with properly pointed drill
	2. Machine spindle not rigid or not running true	—Repair if possible; consider use of bushing
	3. Work piece loose and/or vibrating	—Tighten and hold securely
ROUGH HOLE	1. Incorrect point grind and/or dull drill	—Repoint or replace with properly pointed drill
	2. Excessive feed	—Reduce feed
	3. Incorrect or insufficient coolant	—Correct and adjust
POOR TOOL LIFE	1. Coolant not reaching drill point or insufficient or incorrect coolant	—Correct and adjust
	2. Speed too high and/or feed too low	—Review and adjust
	3. Wrong type of point and/or drill for application	—Review requirements and conditions
WEB SPLITS	1. Insufficient lip clearance	—Repoint or replace with properly pointed drill
	2. Point thinned too much	—Repoint or replace with properly pointed drill
	3. Excessive feed	—Reduce feed
CHIPPED LIPS	1. Excessive lip clearance and/or heel relief	—Repoint or replace with properly pointed drill
BROKEN OUTER CORNERS	1. Insufficient or incorrect coolant	—Correct and adjust
	2. Excessive speed	—Reduce speed
	3. Scale, hard spots encountered in material	—No final remedy if this condition is prevalent; lower feeds and speeds may help

HSS TAPER SHANK - REGULAR

High-Speed Steel 118° Point Taper Shank
Regular Shank - Black Oxide Flutes & Clearance

- Taper shank drills are made to fit tapered holders.
- Precision ground flutes, clearance and point.

FRACTIONAL

Part #	Diameter Inches	Decimal Equivalent Inches	Taper Shank	Overall Length Inches	Flute Length Inches
14150	1/8	.1250	1	5-1/8	1-7/8
14160	9/64	.1406	1	5-3/8	2-1/8
14170	5/32	.1562	1	5-3/8	2-1/8
14180	11/64	.1719	1	5-3/4	2-1/2
14190	3/16	.1875	1	5-3/4	2-1/2
14200	13/64	.2031	1	6	2-3/4
14210	7/32	.2188	1	6	2-3/4
14220	15/64	.2344	1	6-1/8	2-7/8
14230	1/4	.2500	1	6-1/8	2-7/8
14240	17/64	.2656	1	6-1/4	3
14250	9/32	.2812	1	6-1/4	3
14260	19/64	.2969	1	6-3/8	3-1/8
14270	5/16	.3125	1	6-3/8	3-1/8
14280	21/64	.3281	1	6-1/2	3-1/4
14290	11/32	.3438	1	6-1/2	3-1/4
14300	23/64	.3594	1	6-3/4	3-1/2
14310	3/8	.3750	1	6-3/4	3-1/2
14320	25/64	.3906	1	7	3-5/8
14330	13/32	.4062	1	7	3-5/8
14340	27/64	.4219	1	7-1/4	3-7/8
14350	7/16	.4375	1	7-1/4	3-7/8
14360	29/64	.4531	1	7-1/2	4-1/8
14370	15/32	.4688	1	7-1/2	4-1/8
14380	31/64	.4844	2	8-1/4	4-3/8
14390	1/2	.5000	2	8-1/4	4-3/8
14400	33/64	.5156	2	8-1/2	4-5/8
14410	17/32	.5312	2	8-1/2	4-5/8
14420	35/64	.5469	2	8-3/4	4-7/8
14430	9/16	.5625	2	8-3/4	4-7/8
14440	37/64	.5781	2	8-3/4	4-7/8
14450	19/32	.5938	2	8-3/4	4-7/8
14460	39/64	.6094	2	8-3/4	4-7/8
14470	5/8	.6250	2	8-3/4	4-7/8
14480	41/64	.6406	2	9	5-1/8
14490	21/32	.6562	2	9	5-1/8
14500	43/64	.6719	2	9-1/4	5-3/8
14510	11/16	.6875	2	9-1/4	5-3/8
14520	45/64	.7031	2	9-1/2	5-5/8
14530	23/32	.7188	2	9-1/2	5-5/8
14540	47/64	.7344	2	9-3/4	5-7/8
14550	3/4	.7500	2	9-3/4	5-7/8
14560	49/64	.7656	2	9-7/8	6
14570	25/32	.7812	2	9-7/8	6
14580	51/64	.7969	3	10-3/4	6-1/8
14590	13/16	.8125	3	10-3/4	6-1/8
14600	53/64	.8281	3	10-3/4	6-1/8
14610	27/32	.8438	3	10-3/4	6-1/8
14620	55/64	.8591	3	10-3/4	6-1/8
14630	7/8	.8750	3	10-3/4	6-1/8
14640	57/64	.8906	3	10-3/4	6-1/8
14650	29/32	.9062	3	10-3/4	6-1/8
14660	59/64	.9219	3	10-3/4	6-1/8
14670	15/16	.9375	3	10-3/4	6-1/8
14680	61/64	.9531	3	11	6-3/8
14690	31/32	.9688	3	11	6-3/8
14700	63/64	.9844	3	11	6-3/8
14710	1"	1.0000	3	11	6-3/8
14720	1-1/64	1.0156	3	11-1/8	6-1/2
14730	1-1/32	1.0312	3	11-1/8	6-1/2
14740	1-3/64	1.0469	3	11-1/4	6-5/8
14750	1-1/16	1.0625	3	11-1/4	6-5/8
14760	1-5/64	1.0781	4	12-1/2	6-7/8
14770	1-3/32	1.0938	4	12-1/2	6-7/8
14780	1-7/64	1.1094	4	12-3/4	7-1/8
14790	1-1/8	1.1250	4	12-3/4	7-1/8
14800	1-9/64	1.1406	4	12-7/8	7-1/4
14810	1-5/32	1.1562	4	12-7/8	7-1/4
14820	1-11/64	1.1719	4	13	7-3/8
14830	1-3/16	1.1875	4	13	7-3/8
14840	1-13/64	1.2031	4	13-1/8	7-1/2
14850	1-7/32	1.2188	4	13-1/8	7-1/2
14860	1-15/64	1.2344	4	13-1/2	7-7/8
14870	1-1/4	1.2500	4	13-1/2	7-7/8
14880	1-17/64	1.2656	4	14-1/8	8-1/2
14890	1-9/32	1.2812	4	14-1/8	8-1/2
14900	1-19/64	1.2969	4	14-1/4	8-5/8
14910	1-5/16	1.3125	4	14-1/4	8-5/8
14920	1-21/64	1.3281	4	14-3/8	8-3/4
14930	1-11/32	1.3438	4	14-3/8	8-3/4
14940	1-23/64	1.3594	4	14-1/2	8-7/8
14950	1-3/8	1.3750	4	14-1/2	8-7/8
14960	1-25/64	1.3906	4	14-5/8	9
14970	1-13/32	1.4062	4	14-5/8	9
14980	1-27/64	1.4219	4	14-3/4	9-1/8
14990	1-7/16	1.4375	4	14-3/4	9-1/8
15000	1-29/64	1.4531	4	14-7/8	9-1/4
15010	1-15/32	1.4688	4	14-7/8	9-1/4
15020	1-31/64	1.4844	4	15	9-3/8
15030	1-1/2	1.5000	4	15	9-3/8
15040	1-17/32	1.5312	5	16-3/8	9-3/8
15050	1-9/16	1.5625	5	16-5/8	9-5/8
15060	1-19/32	1.5938	5	16-7/8	9-7/8
15070	1-5/8	1.6250	5	17	10
15080	1-21/32	1.6562	5	17-1/8	10-1/8
15090	1-11/16	1.6875	5	17-1/8	10-1/8
15100	1-23/32	1.7188	5	17-1/8	10-1/8
15110	1-3/4	1.7500	5	17-1/8	10-1/8
15120	1-25/32	1.7812	5	17-1/8	10-1/8
15130	1-13/16	1.8125	5	17-1/8	10-1/8
15140	1-27/32	1.8438	5	17-1/8	10-1/8
15150	1-7/8	1.8750	5	17-3/8	10-3/8
15160	1-29/32	1.9062	5	17-3/8	10-3/8
15170	1-15/16	1.9375	5	17-3/8	10-3/8
15180	1-31/32	1.9688	5	17-3/8	10-3/8
15190	2"	2.0000	5	17-3/8	10-3/8
15200	2-1/32	2.0312	5	17-3/8	10-3/8
15210	2-1/16	2.0625	5	17-3/8	10-1/4
15220	2-3/32	2.0938	5	17-3/8	10-1/4
15230	2-1/8	2.1250	5	17-3/8	10-1/4
15240	2-5/32	2.1562	5	17-3/8	10-1/4
15250	2-3/16	2.1875	5	17-3/8	10-1/4
15260	2-7/32	2.2188	5	17-3/8	10-1/8
15270	2-1/4	2.2500	5	17-3/8	10-1/8
15280	2-5/16	2.3125	5	17-3/8	10-1/8
15290	2-3/8	2.3750	5	17-3/8	10-1/8
15300	2-7/16	2.4375	5	18-3/4	11-1/4
15310	2-1/2	2.5000	5	18-3/4	11-1/4

- Continued

High-Speed Steel Taper Shank Regular Shank - Black Oxide

LETTER

Part #	Letter Size	Decimal Equivalent Inches	Taper Shank	Overall Length Inches	Flute Length Inches
15700	A	.234	1	6-1/8	2-7/8
15710	B	.238	1	6-1/8	2-7/8
15720	C	.242	1	6-1/8	2-7/8
15730	D	.246	1	6-1/8	2-7/8
15740	E	.250	1	6-1/8	2-7/8
15750	F	.257	1	6-1/4	3
15760	G	.261	1	6-1/4	3
15770	H	.266	1	6-1/4	3
15780	I	.272	1	6-1/4	3
15790	J	.277	1	6-1/4	3
15800	K	.281	1	6-1/4	3
15810	L	.290	1	6-3/8	3-1/8
15820	M	.295	1	6-3/8	3-1/8
15830	N	.302	1	6-3/8	3-1/8
15840	O	.316	1	6-1/2	3-1/4
15850	P	.323	1	6-1/2	3-1/4
15860	Q	.332	1	6-1/2	3-1/4
15870	R	.339	1	6-1/2	3-1/4
15880	S	.348	1	6-3/4	3-1/2
15890	T	.358	1	6-3/4	3-1/2
15900	U	.368	1	6-3/4	3-1/2
15910	V	.377	1	7	3-5/8
15920	W	.386	1	7	3-5/8
15930	X	.397	1	7	3-5/8
15940	Y	.404	1	7	3-5/8
15950	Z	.413	1	7-1/4	3-7/8

High-Speed Steel Taper Shank - Shank Larger than Regular -Black Oxide

- Taper shank drills are made to fit tapered holders.
- They are designed to perform well under a variety of normal conditions in a wide range of materials.

FRACTIONAL

Part #	Diameter Inches	Decimal Equivalent Inches	Taper Shank	Overall Length Inches	Flute Length Inches
15450	3/8	.3750	2	7-3/8	3-1/2
15460	25/64	.3906	2	7-1/2	3-5/8
15470	13/32	.4062	2	7-1/2	3-5/8
15480	27/64	.4219	2	7-3/4	3-7/8
15490	7/16	.4375	2	7-3/4	3-7/8
15500	29/64	.4531	2	8	4-1/8
15510	15/32	.4688	2	8	4-1/8
15520	41/64	.6406	3	9-3/4	5-1/8
15530	21/32	.6262	3	9-3/4	5-1/8
15540	43/64	.6719	3	10	5-3/8
15550	11/16	.6875	3	10	5-3/8
15560	45/64	.7031	3	10-1/4	5-5/8
15570	23/32	.7188	3	10-1/4	5-5/8
15580	47/64	.7344	3	10-1/2	5-7/8
15590	3/4	.7500	3	10-1/2	5-7/8
15600	49/64	.7656	3	10-5/8	6
15610	25/32	.7812	3	10-5/8	6
15620	1"	1.0000	4	12	6-3/8
15630	1-1/32	1.0312	4	12-1/8	6-1/2
15640	1-1/16	1.0625	4	12-1/4	6-5/8

High-Speed Steel Taper Shank - Shank Smaller than Regular - Black Oxide

- Taper shank drills are made to fit tapered holders.
- They are designed to perform well under a variety of normal conditions in a wide range of materials.
- Packaged individually.

FRACTIONAL

Part #	Diameter Inches	Decimal Equivalent Inches	Taper Shank	Overall Length Inches	Flute Length Inches
16050	31/64	.4844	1	7-3/4	4-3/8
16060	1/2	.5000	1	7-3/4	4-3/8
16070	33/64	.5156	1	8	4-5/8
16080	17/32	.5312	1	8	4-5/8
16090	35/64	.5469	1	8-1/4	4-7/8
16100	9/16	.5625	1	8-1/4	4-7/8
16110	51/64	.7969	2	10	6-1/8
16120	13/16	.8125	2	10	6-1/8
16130	53/64	.8281	2	10	6-1/8
16140	27/32	.8438	2	10	6-1/8
16150	55/64	.8594	2	10	6-1/8
16160	7/8	.8750	2	10	6-1/8
16170	57/64	.8906	2	10	6-1/8
16180	29/32	.9062	2	10	6-1/8
16190	1-5/64	1.0781	3	11-1/2	6-7/8
16200	1-3/32	1.0938	3	11-1/2	6-7/8
16210	1-7/64	1.1094	3	11-3/4	7-1/8
16220	1-1/8	1.1250	3	11-3/4	7-1/8
16230	1-9/64	1.1406	3	11-7/8	7-1/4
16240	1-5/32	1.1562	3	11-7/8	7-1/4
16250	1-11/64	1.1719	3	12	7-3/8
16260	1-3/16	1.1875	3	12	7-3/8
16270	1-13/64	1.2031	3	12-1/8	7-1/2
16280	1-7/32	1.2188	3	12-1/8	7-1/2
16290	1-15/64	1.2344	3	12-1/2	7-7/8
16300	1-1/4	1.2500	3	12-1/2	7-7/8
16320	1-17/32	1.5312	4	15	9-3/8
16340	1-9/16	1.5625	4	15-1/4	9-5/8
16360	1-19/32	1.5938	4	15-1/2	9-7/8
16380	1-5/8	1.6250	4	15-5/8	10
16400	1-21/32	1.6562	4	15-3/4	10-1/8
16420	1-11/16	1.6875	4	15-3/4	10-1/8
16440	1-23/32	1.7188	4	15-3/4	10-1/8
16460	1-3/4	1.7500	4	16-1/4	10-3/8
16470	1-25/32	1.7812	4	16-1/4	10-3/8
16480	1-13/16	1.8125	4	16-1/4	10-3/8
16490	1-27/32	1.8438	4	16-1/4	10-3/8
16500	1-7/8	1.8750	4	16-1/2	10-1/2
16510	1-29/32	1.9062	4	16-1/2	10-1/2
16520	1-15/16	1.9375	4	16-5/8	10-5/8
16530	1-31/32	1.9688	4	16-5/8	10-5/8
16540	2"	2.0000	4	16-5/8	10-5/8

Twist Drills - HSS - Jobber Series

Low temperture stress relief improves lubricity and toughness.

FRACTIONAL

Part #	Diameter Inches	Overall Length Inches	Flute Length Inches
05580	1/16	1-7/8	7/8
05590	5/64	2	1
05600	3/32	2-1/4	1-1/4
05610	7/64	2-5/8	1-1/2
05620	1/8	2-3/4	1-5/8
05630	9/64	2-7/8	1-3/4
05640	5/32	3-1/8	2
05650	11/64	3-1/4	2-1/8
05660	3/16	3-1/2	2-5/16
05670	13/64	3-5/8	2-7/16
05680	7/32	3-3/4	2-1/2
05690	15/64	3-7/8	2-5/8
05700	1/4	4	2-3/4
05710	17/64	4-1/8	2-7/8
05720	9/32	4-1/4	2-15/16
05730	19/64	4-3/8	3-1/16
05740	5/16	4-1/2	3-3/16
05750	21/64	4-5/8	3-5/16
05760	11/32	4-3/4	3-7/16
05770	23/64	4-7/8	3-1/2
05780	3/8	5	3-5/8
05790	25/64	5-1/8	3-3/4
05800	13/32	5-1/4	3-7/8
05810	27/64	5-3/8	3-15/16
05820	7/16	5-1/2	4-1/16
05830	29/64	5-5/8	4-3/16
05840	15/32	5-3/4	4-5/16
05850	31/64	5-7/8	4-3/8
05860	1/2	6	4-1/2
22210	33/64	6-5/8	4-13/16
22220	17/32	6-5/8	4-13/16
22230	35/64	6-5/8	4-13/16
22240	9/16	6-5/8	4-13/16
22250	37/64	6-5/8	4-13/16
22260	19/32	7-1/8	5-3/16
22270	39/64	7-1/8	5-3/16
22280	5/8	7-1/8	5-3/16
22290	41/64	7-1/8	5-3/16
22300	21/32	7-1/8	5-3/16
22310	43/64	7-5/8	5-5/8
22320	11/16	7-5/8	5-5/8
22330	45/64	7-5/8	5-5/8
22340	23/32	7-5/8	5-5/8
22350	47/64	7-5/8	5-5/8
22360	3/4	7-3/8	5-5/8

LETTER

Part #	Letter Size	Overall Length Inches	Flute Length Inches
39460	A	3-7/8	2-5/8
39470	B	4	2-3/4
39480	C	4	2-3/4
39490	D	4	2-3/4
39500	E	4	2-3/4
39510	F	4-1/8	2-7/8
39520	G	4-1/8	2-7/8
39530	H	4-1/8	2-7/8
39540	I	4-1/8	2-7/8
39550	J	4-1/8	2-7/8
39560	K	4-1/4	2-15/16
39570	L	4-1/4	2-15/16
39580	M	4-3/8	3-1/16
39590	N	4-3/8	3-1/16
39600	O	4-1/2	3-3/16
39610	P	4-5/8	3-5/16
39620	Q	4-3/4	3-7/16
39630	R	4-3/4	3-7/16
39640	S	4-7/8	3-1/2
39650	T	4-7/8	3-1/2
39660	U	5	3-5/8
39670	V	5	3-5/8
39680	W	5-1/8	3-3/4
39690	X	5-1/8	3-3/4
39700	Y	5-1/4	3-7/8
39710	Z	5-1/4	3-7/8

WIRE

Part #	Wire Size	Overall Length Inches	Flute Length Inches
38940	1	3-7/8	2-5/8
38950	2	3-7/8	2-5/8
38960	3	3-3/4	2-1/2
38970	4	3-3/4	2-1/2
38980	5	3-3/4	2-1/2
38990	6	3-3/4	2-1/2
39000	7	3-5/8	2-7/16
39010	8	3-5/8	2-7/16
39020	9	3-5/8	2-7/16
39030	10	3-5/8	2-7/16
39040	11	3-1/2	2-5/16
39050	12	3-1/2	2-5/16
39060	13	3-1/2	2-5/16
39070	14	3-3/8	2-3/16
39080	15	3-3/8	2-3/16
39090	16	3-3/8	2-3/16
39100	17	3-3/8	2-3/16
39110	18	3-1/4	2-1/8
39120	19	3-1/4	2-1/8
39130	20	3-1/4	2-1/8

Twist Drills - HSS - 3/8" Reduced Shank & HSS 135* Split Point

- 135° split point for fast penetration and accurate starting without center punch.
- Precision ground point, flutes, body, clearance and drill diameter for the ultimate in accuracy and performance.

Recommended for use in work hardening grades of stainless steel and other hard metal drilling applications

3/8" REDUCED SHANK

Part #	Diameter Inches	Overall Length Inches	Flute Length Inches
59200	25/64	5-1/8	3-3/4
59210	13/32	5-1/4	3-7/8
59220	27/64	5-3/8	3-15/16
59230	7/16	5-1/2	4-1/16
59240	29/64	5-5/8	4-3/16
59250	15/32	5-3/4	4-5/16
59260	31/64	5-7/8	4-3/8
59270	1/2	6	4-1/2
59280	17/32	6	4-1/4
59290	9/16	6	4-1/4
59300	19/32	6	4-1/4
59310	5/8	6	4-1/4

WIRE

Part #	Wire Sizes	Overall Length Inches	Flute Length Inches
39140	21	3-1/4	2-1/8
39150	22	3-1/8	2
39160	23	3-1/8	2
39170	24	3-1/8	2
39180	25	3	1-7/8
39190	26	3	1-7/8
39200	27	3	1-7/8
39210	28	2-7/8	1-3/4
39220	29	2-7/8	1-3/4
39230	30	2-3/4	1-5/8
92310	31	2-3/4	1-5/8
92300	32	2-3/4	1-5/8
92290	33	2-5/8	1-1/2
92280	34	2-5/8	1-1/2
92270	35	2-5/8	1-1/2
92260	36	2-1/2	1-7/16
92250	37	2-1/2	1-7/16
92240	38	2-1/2	1-7/16
92230	39	2-3/8	1-3/8
92220	40	2-3/8	1-3/8
88420	41	2-3/8	1-3/8
88410	42	2-1/4	1-1/4
88400	43	2-1/4	1-1/4
88390	44	2-1/8	1-1/8
88380	45	2-1/8	1-1/8
88370	46	2-1/8	1-1/8
88360	47	2	1
88350	48	2	1
88340	49	2	1
88330	50	2	1
88320	51	2	1
88310	52	1-7/8	7/8
88300	53	1-7/8	7/8
88290	54	1-7/8	7/8
88280	55	1-7/8	7/8
88270	56	1-3/4	3/4
88260	57	1-3/4	3/4
88250	58	1-5/8	11/16
88240	59	1-5/8	11/16
88230	60	1-5/8	11/16

Twist Drills - Jobber Series - Metric

- 135° split point provides fast penetration and accurate starting without a center punch.
- Withstands substantially higher drilling tempertures while maintaining sharpness.

Recommended for use in work hardening grades of stainless steel and other hard metal drilling applications.

METRIC

Part #	Dia. MM	Overall Length MM	Overall Length Inches	Flute Length MM	Flute Length Inches
48760	0.70	32	1-1/4	10	25/64
48780	0.80	35	1-3/8	13	1/2
48790	0.85	38	1-1/2	16	5/8
48800	0.90	38	1-1/2	16	5/8
49990	0.95	38	1-1/2	16	5/8
48690	0.98	38	1-1/2	16	5/8
48820	1.00	41	1-5/8	17	11/16
48750	1.05	41	1-5/8	17	11/16
48840	1.10	44	1-3/4	19	3/4
48850	1.15	44	1-3/4	19	3/4
23270	1.18	44	1-3/4	19	3/4
48860	1.20	48	1-7/8	22	7/8
48870	1.25	48	1-7/8	22	7/8
48880	1.30	48	1-7/8	22	7/8
48890	1.35	48	1-7/8	22	7/8
48900	1.40	48	1-7/8	22	7/8
48910	1.45	48	1-7/8	22	7/8
48920	1.50	48	1-7/8	22	7/8
48930	1.55	48	1-7/8	22	7/8
48940	1.60	48	1-7/8	22	7/8
48950	1.65	51	2	25	1
48960	1.70	51	2	25	1
48970	1.75	51	2	25	1
48980	1.80	51	2	25	1
49000	1.90	51	2	25	1
49020	2.00	51	2	25	1
49030	2.05	54	2-1/8	29	1-5/32
49040	2.10	54	2-1/8	29	1-5/32
49060	2.20	57	2-1/4	32	1-1/4
49080	2.30	57	2-1/4	32	1-1/4
49100	2.40	60	2-23/64	35	1-3/8
49120	2.50	60	2-23/64	35	1-3/8
49130	2.60	64	2-1/2	37	1-29/64
49140	2.70	64	2-1/2	37	1-15/32
49150	2.80	67	2-5/8	38	1-1/2
49160	2.90	70	2-3/4	41	1-5/8
49170	3.00	70	2-3/4	41	1-5/8
49180	3.10	70	2-3/4	41	1-5/8
49190	3.20	70	2-3/4	41	1-5/8
49200	3.30	73	2-7/8	45	1-3/4
49210	3.40	73	2-7/8	45	1-3/4
49220	3.50	73	2-7/8	45	1-3/4
49230	3.60	76	3	48	1-7/8
49240	3.70	76	3	48	1-7/8
49250	3.80	76	3	48	1-7/8
49260	3.90	79	3-1/8	51	2

Part #	Dia. MM	Overall Length MM	Overall Length Inches	Flute Length MM	Flute Length Inches
49270	4.00	83	3-1/4	54	2-1/8
49280	4.10	83	3-1/4	54	2-1/8
49290	4.20	83	3-1/4	54	2-1/8
49300	4.30	83	3-1/4	54	2-1/8
49310	4.40	86	3-3/8	56	2-13/64
49320	4.50	86	3-3/8	56	2-13/64
49330	4.60	86	3-3/8	56	2-13/64
49340	4.70	89	3-1/2	59	2-21/64
49350	4.80	89	3-1/2	59	2-21/64
49360	4.90	92	3-5/8	62	2-7/16
49370	5.00	92	3-5/8	62	2-7/16
49380	5.10	92	3-5/8	62	2-7/16
49390	5.20	95	3-3/4	64	2-1/2
49400	5.30	95	3-3/4	64	2-1/2
49410	5.40	95	3-3/4	64	2-1/2
49420	5.50	95	3-3/4	64	2-1/2
49430	5.60	98	3-7/8	67	2-5/8
49440	5.70	98	3-7/8	67	2-5/8
49450	5.80	98	3-7/8	67	2-5/8
49460	5.90	98	3-7/8	67	2-5/8
49470	6.00	102	4	70	2-3/4
49480	6.10	102	4	70	2-3/4
49490	6.20	102	4	70	2-3/4
49500	6.30	102	4	70	2-3/4
49510	6.40	105	4-1/8	73	2-7/8
49520	6.50	105	4-1/8	73	2-7/8
49530	6.60	105	4-1/8	73	2-7/8
49540	6.70	105	4-1/8	73	2-7/8
49550	6.80	105	4-1/8	73	2-7/8
49560	6.90	105	4-1/8	73	2-7/8
49570	7.00	105	4-1/8	73	2-7/8
49580	7.10	108	4-1/4	75	2-61/64
49590	7.20	108	4-1/4	75	2-61/64
49600	7.30	108	4-1/4	75	2-61/64
49610	7.40	111	4-3/8	78	3
49620	7.50	111	4-3/8	78	3
49630	7.60	111	4-3/8	78	3
49640	7.70	114	4-1/2	81	3-3/16
49650	7.80	114	4-1/2	81	3-3/16
49660	7.90	114	4-1/2	81	3-3/16
49670	8.00	114	4-1/2	81	3-3/16
49680	8.10	117	4-9/16	84	3-5/16
49690	8.20	117	4-9/16	84	3-5/16
49700	8.30	117	4-9/16	84	3-5/16
49710	8.40	121	4-3/4	87	3-27/64

Twist Drills - Jobber Series - 1/4" & 3/8" Reduced Shank

General Purpose 118° point - Bright Finish 1/4" Reduced Shank - Shorter than Jobber Length

- Shorter than Jobber length increases rigidity and improves drilling performance.
- Designed for use in portable air and electric drilling equipment with 1/4" chucks.

FRACTIONAL

Part #	Diameter Inches	Overall Length Inches	Flute Length Inches
28800	17/64	3-1/2	1-7/8
28810	9/32	3-19/32	1-31/32
28820	19/64	3-23/32	2-1/16
28830	5/16	3-27/32	2-3/16
28840	21/64	4	2-9/32
28850	11/32	4-1/32	2-11/32
28860	23/64	4-5/32	2-15/32
28870	3/8	4-1/4	2-9/16
28880	25/64	4-11/32	2-5/8
28890	13/32	4-15/32	2-3/4
28900	27/64	4-9/16	2-27/32
28910	7/16	4-11/16	2-15/16
28920	29/64	4-25/32	3-1/32
28930	15/32	4-7/8	3-1/8
28940	31/64	5	3-7/32
28950	1/2	5	3-7/32

General Purpose 118° point - Bright Finish 3/8" Reduced Shank - Jobber Length

- General purpose 118° point HSS drill is designed for use in portable air or electric drilling equipment with 3/8" chucks.
- **NOTE:** Surface treated flutes on sizes larger than 1/2".

FRACTIONAL

Part #	Diameter Inches	Overall Length Inches	Flute Length Inches
59570	25/64	5-1/8	3-3/4
59580	13/32	5-1/4	3-7/8
59590	27/64	5-3/8	3-15/16
59500	7/16	5-1/2	4-1/16
59600	29/64	5-5/8	4-3/16
59510	15/32	5-3/4	4-5/16
59610	31/64	5-7/8	4-3/8
59520	1/2	6	4-1/2
59530	17/32	6	4-1/4
59540	9/16	6	4-1/4
59550	19/32	6	4-1/4
59560	5/8	6	4-1/4

Twist Drills – High Helix

- HSS drill performs well in deep hole drilling of low tensile strength material such as aluminum, zinc, copper, wood, refrigeration die castings, auto hardware & epoxy based plastics.
- Use to drill free machining steels, brass & bronze.

FRACTIONAL

Part #	Diameter Inches	Overall Length Inches	Flute Length Inches
06550	1/32	1-3/8	1/2
06560	3/64	1-3/4	3/4
06570	1/16	1-7/8	7/8
06580	5/64	2	1
06590	3/32	2-1/4	1-1/4
06600	7/64	2-5/8	1-1/2
06610	1/8	2-3/4	1-5/8
06620	9/64	2-7/8	1-3/4
06630	5/32	3-1/8	2
06640	11/64	3-1/4	2-1/8
06650	3/16	3-1/2	2-5/16
06660	13/64	3-5/8	2-7/16
06670	7/32	3-3/4	2-1/2
06680	15/64	3-7/8	2-5/8
06690	1/4	4	2-3/4
06700	17/64	4-1/8	2-7/8
06710	9/32	4-1/4	2-15/16
06720	19/64	4-3/8	3-1/16
06730	5/16	4-1/2	3-3/16
06740	21/64	4-5/8	3-5/16
06750	11/32	4-3/4	3-7/16
06760	23/64	4-7/8	3-1/2
06770	3/8	5	3-5/8
06780	25/64	5-1/8	3-3/4
06790	13/32	5-1/4	3-7/8
06800	27/64	5-3/8	3-15/16
06810	7/16	5-1/2	4-1/16
06820	29/64	5-5/8	4-3/16
06830	15/32	5-3/4	4-5/16
06840	31/64	5-7/8	4-3/8
06850	1/2	6	4-1/2

LETTER

Part #	Letter Sizes	Overall Length Inches	Flute Length Inches
07660	A	3-7/8	2-5/8
07670	B	4	2-3/4
07680	C	4	2-3/4
07690	D	4	2-3/4
07700	E	4	2-3/4
07710	F	4-1/8	2-7/8
07720	G	4-1/8	2-7/8
07730	H	4-1/8	2-7/8
07740	I	4-1/8	2-7/8
07750	J	4-1/8	2-7/8
07760	K	4-1/4	2-15/16
07770	L	4-1/4	2-15/16
07780	M	4-3/8	3-1/16
07790	N	4-3/8	3-1/16
07800	O	4-1/2	3-3/16
07810	P	4-5/8	3-5/16
07820	Q	4-3/4	3-7/16
07830	R	4-3/4	3-7/16
07840	S	4-7/8	3-1/2
07850	T	4-7/8	3-1/2
07860	U	5	3-5/8
07870	V	5	3-5/8
07880	W	5-1/8	3-3/4
07890	X	5-1/8	3-3/4
07900	Y	5-1/4	3-7/8
07910	Z	5-1/4	3-7/8

Twist Drills - HSS Taper Length

High-Speed Steel 118° Point

- Bright finish thru 1" diameter.
- Surface treated flutes over 3/4" diameter.

FRACTIONAL

Part #	Diameter Inches	Overall Length Inches	Flute Length Inches
10490	3/64	2-1/4	1-1/8
10500	1/16	3	1-3/4
10510	5/64	3-3/4	2
10520	3/32	4-1/4	2-1/4
10530	7/64	4-5/8	2-1/2
10540	1/8	5-1/8	2-3/4
10550	9/64	5-3/8	3
10560	5/32	5-3/8	3
10570	11/64	5-3/4	3-3/8
10580	3/16	5-3/4	3-3/8
10590	13/64	6	3-5/8
10600	7/32	6	3-5/8
10610	15/64	6-1/8	3-3/4
10620	1/4	6-1/8	3-3/4
10630	17/64	6-1/4	3-7/8
10640	9/32	6-1/4	3-7/8
10650	19/64	6-3/8	4
10660	5/16	6-3/8	4
10670	21/64	6-1/2	4-1/8
10680	11/32	6-1/2	4-1/8
10690	23/64	6-3/4	4-1/4
10700	3/8	6-3/4	4-1/4
10710	25/64	7	4-3/8
10720	13/32	7	4-3/8
10730	27/64	7-1/4	4-5/8
10740	7/16	7-1/4	4-5/8
10750	29/64	7-1/2	4-3/4
10760	15/32	7-1/2	4-3/4
10770	31/64	7-3/4	4-3/4
10780	1/2	7-3/4	4-3/4
10790	33/64	8	4-3/4
10800	17/32	8	4-3/4
10810	35/64	8-1/4	4-7/8
10820	9/16	8-1/4	4-7/8
10830	37/64	8-3/4	4-7/8
10840	19/32	8-3/4	4-7/8
10850	39/64	8-3/4	4-7/8
10860	5/8	8-3/4	4-7/8
10870	41/64	9	5-1/8
10880	21/32	9	5-1/8
10890	43/64	9-1/4	5-3/8
10900	11/16	9-1/4	5-3/8
10910	45/64	9-1/2	5-5/8
10920	23/32	9-1/2	5-5/8
10930	47/64	9-3/4	5-7/8
10940	3/4	9-3/4	5-7/8
10950	49/64	9-7/8	6
10960	25/32	9-7/8	6
10970	51/64	10	6-1/8
10980	13/16	10	6-1/8
10990	53/64	10	6-1/8
11000	27/32	10	6-1/8
11010	55/64	10	6-1/8
11020	7/8	10	6-1/8
11030	57/64	10	6-1/8
11040	29/32	10	6-1/8
11050	59/64	10-3/4	6-1/8

FRACTIONAL

Part #	Diameter Inches	Overall Length Inches	Flute Length Inches
11060	15/16	10-3/4	6-1/8
11070	61/64	11	6-3/8
11080	31/32	11	6-3/8
11090	63/64	11	6-3/8
11100	1"	11	6-3/8
11110	1-1/64	11-1/8	6-1/2
11120	1-1/32	11-1/8	6-1/2
11130	1-3/64	11-1/4	6-5/8
11140	1-1/16	11-1/4	6-5/8
11150	1-5/64	11-1/2	6-7/8
11160	1-3/32	11-1/2	6-7/8
11170	1-7/64	11-3/4	7-1/8
11180	1-1/8	11-3/4	7-1/8
11190	1-9/64	11-7/8	7-1/4
11200	1-5/32	11-7/8	7-1/4
11210	1-11/64	12	7-3/8
11220	1-3/16	12	7-3/8
11230	1-13/64	12-1/8	7-1/2
11240	1-7/32	12-1/8	7-1/2
11250	1-15/64	12-1/2	7-7/8
11260	1-1/4	12-1/2	7-7/8
11270	1-9/32	14-1/8	8-1/2
11280	1-5/16	14-1/4	8-5/8
11290	1-11/32	14-3/8	8-3/4
11300	1-3/8	14-1/2	8-7/8
11310	1-13/32	14-5/8	9
11320	1-7/16	14-3/4	9-1/8
11330	1-15/32	14-7/8	9-1/4
11340	1-1/2	15	9-3/8
11350	1-9/16	15-1/4	9-5/8
11360	1-5/8	15-5/8	9-7/8
11370	1-3/4	16-1/4	10-1/2

LETTER

Part #	Letter Sizes	Overall Length Inches	Flute Length Inches
11380	A	6-1/8	3-3/4
11390	B	6-1/8	3-3/4
11400	C	6-1/8	3-3/4
11410	D	6-1/8	3-3/4
11420	E	6-1/8	3-3/4
11430	F	6-1/4	3-7/8
11440	G	6-1/4	3-7/8
11450	H	6-1/4	3-7/8
11460	I	6-1/4	3-7/8
11470	J	6-1/4	3-7/8
11480	K	6-1/4	3-7/8
11490	L	6-3/8	4
11500	M	6-3/8	4
11510	N	6-3/8	4
11520	O	6-1/2	4-1/8
11530	P	6-1/2	4-1/8
11540	Q	6-1/2	4-1/8
11550	R	6-1/2	4-1/8
11560	S	6-3/4	4-1/4
11570	T	6-3/4	4-1/4
11580	U	6-3/4	4-1/4
11590	V	7	4-3/8
11600	W	7	4-3/8
11610	X	7	4-3/8
11620	Y	7	4-3/8
11630	Z	7-1/4	4-5/8