FASTCUT TOOL™

TAPS AND DIES
2006

American Made
American Owned

Founded in 1957, Fastcut Tool lives up to its name with America's most extensive, fast-cutting line of roughing end mills. For over five decades, Fastcut has specialized in the manufacture of quality end mills sold nationally through industrial distributors. This new catalog represents the results of our continuing commitment to our industry. New products include an expanded line of metric cast iron taps and over 70 sizes of spiral fluted, 50° helix taps.

Fastcut manufactures Ruff-N-Cutt®, the original U.S. made roughing mill designed for accelerated stock removal. Ruff-N-Tuff®, fine-pitch roughers for cutting high-temperature alloys, and Ruff-N-Touch®, end mills for roughing and finishing in one operation. All three enable users to increase productivity while achieving outstanding results.

Fastcut's longstanding quality and commitment to American industry have made us a trusted source for distributors and manufacturers for generations. Our channel partners include traditional distributors, multi-location distributors and specialized cutting tool houses. Our end-user customer list includes major aerospace companies, automotive and automotive parts suppliers, large capital equipment manufacturers, fastener, pipe fitting and valve manufacturers, as well as large, mid-sized and small machine shops. All are vitally important to us and reflect our steadfast commitment to, and belief in, American manufacturing.

Whether your manufacturing needs call for a standard end mill or a large diameter tool with custom geometry, standard or special taps, we can meet all of your round tool cutting needs. Please call us and let us show you why Fastcut has remained a leading supplier to American industry since 1957.

American Made
American Owned

FASTCUT TOOL™

INDEX

PRODUCT

INDEX

Tap Standard Package Quantities

STANDARD TAPS		METRIC TAPS		PIPE TAPS	
TAP SIZE	UNITS	TAP SIZE	UNITS	TAP SIZE	UNITS
#0 – 1/2"	12 Pcs	Thru M12	12 Pcs	1/16" & 1/8"	12 Pcs
9/16" – 1"	3 Pcs	M14 – M24	3 Pcs	1/4" – 1/2"	6 Pcs
1-1/8" & Larger	1 Pc	M27 & Larger	1 Pc	3/4" – 1"	3 Pcs
				1-1/4" & Larger	1 Pc

Limited Warranty

Fastcut Tool warrants to original equipment manufacturers, distributors and industrial and commercial users of its products that each new product which it manufactures or supplies is free from defects in material and workmanship. Its sole obligation under this warranty is limited to furnishing, without additional charge, a replacement for, or, at its option, repairing or issuing credit for any such product which shall, within one year from the date of sale by Fastcut Tool, be returned freight prepaid to Fastcut Tool and which, upon inspection, is determined by Fastcut Tool to be defective in materials or workmanship. The provisions of this warranty shall not apply to any product which has been subjected to misuse, improper operating conditions, or which has been repaired or altered, if such would adversely affect performance of the product. Complete written information with respect to all such matters must be furnished to Fastcut Tool as a prerequisite to its consideration of any claim or complaint under this warranty.

The repair, replacement or issuance of credit for parts provided for in this warranty constitutes the Buyer's exclusive remedy. The warranty is in lieu of all other warranties, express or implied, including any implied warranty of merchantability or fitness for a particular purpose. Fastcut Tool has no liability or responsibility on any claim of any kind, whether in contract, tort or otherwise, for any loss or damage arising out of, connected with, or resulting from the manufacture, sale, delivery or use of any product sold hereunder, in excess of the cost of replacement or repair as provided herein. In no event shall Fastcut Tool be liable for any special, incidental or consequential damages. Fastcut Tool makes no other warranty, express or implied, except as set forth above; and neither assumes nor authorizes any other person or entity to assume for it any other obligation or liability in connection with any of its products.

WARNING

Any cutting tool may break or shatter under improper use. Government regulations require use of safety glasses and other appropriate safety equipment at all times in the vicinity of use. Wet or dry grinding of cutting tools produces potentially hazardous dusts or mists; to avoid adverse health effects, use adequate ventilation and read the material Safety Data Sheet for further applicable tool material or grade before grinding.

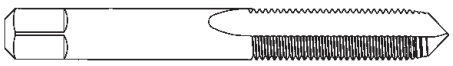
These general purpose taps can be used by hand or under power, in through or blind holes and are suitable for tapping most materials. The chips are retained in the flutes during use. Three-fluted taps have the greatest chip holding capacity and should be used, in the size range where available, for tapping holes deeper than 1-1/2 diameters. A variety of surface treatments are available to improve performance. See Page 49 for recommendations. See Table 302 on Page 33 for tap dimensions.

LIST 102

Machine Screw High Speed Steel

THREAD FORM
American National

CHAMFER STYLE
Taper (7 to 10 threads), Plug (3 to 5 threads), Bottoming (1 to 2 threads)
If chamfer style is not specified, plug will be furnished



SIZE	NC NF NS	H-LIMIT	FLUTES	EDP NO. TAPER	PLUG	BOTTOM	SET
0-80	NF	H1	2	10000	10001	10002	10003
0-80	NF	H2	2		10005	10006	
1-64	NC	H1	2	10008	10009	10010	10011
1-64	NC	H2	2		10013		
1-72	NF	H1	2	10016	10017	10018	10019
1-72	NF	H2	2		10021	10022	
2-56	NC	H1	3	10028	10029	10030	10031
2-56	NC	H2	2		10033	10034	
2-56	NC	H2	3	10036	10037	10038	10039
2-64	NF	H2	3	10044	10045	10046	10047
3-48	NC	H1	3		10049		
3-48	NC	H2	2		10053	10054	
3-48	NC	H2	3	10056	10057	10058	10059
3-56	NF	H2	3	10060	10061	10062	10063
4-40	NC	H1	2		10065		
4-40	NC	H1	3	10068	10069	10070	10071
4-40	NC	H2	2		10073	10074	
4-40	NC	H2	3	10076	10077	10078	10079
4-48	NF	H1	3		10081		
4-48	NF	H2	3	10084	10085	10086	10087
4-36	NS	H2	3	10088	10089	10090	10091
5-40	NC	H1	3		10093	10094	
5-40	NC	H2	2		10097	10098	
5-40	NC	H2	3	10100	10101	10102	10103
5-44	NF	H2	2		10105		
5-44	NF	H2	3	10108	10109	10110	10111
6-32	NC	H1	2		10113		
6-32	NC	H1	3	10116	10117	10118	10119
6-32	NC	H2	2		10121	10122	
6-32	NC	H2	3	10124	10125	10126	10127
6-32	NC	H3	2		10129	10130	
6-32	NC	H3	3	10132	10133	10134	10135
6-32	NC	H7	3		10137	10138	
6-40	NF	H1	3		10141		
6-40	NF	H2	2		10145		
6-40	NF	H2	3	10148	10149	10150	10151
8-32	NC	H1	2		10153		
8-32	NC	H1	3		10157	10158	
8-32	NC	H1	4	10160	10161	10162	10163
8-32	NC	H2	2		10165	10166	

continued

LIST 102 *continued*

Machine Screw High Speed Steel

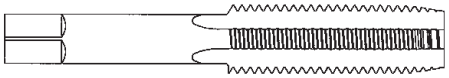
SIZE	NC NF NS	H-LIMIT	FLUTES	EDP NO. TAPER	PLUG	BOTTOM	SET
8-32	NC	H2	3		10169	10170	
8-32	NC	H2	4	10172	10173	10174	10175
8-32	NC	H3	2		10177	10178	
8-32	NC	H3	3		10181	10182	
8-32	NC	H3	4	10184	10185	10186	10187
8-32	NC	H7	3		10189	10190	
8-32	NC	H7	4		10193	10194	
8-36	NF	H1	4		10197		
8-36	NF	H2	4	10200	10201	10202	10203
10-24	NC	H1	3		10205		
10-24	NC	H1	4	10208	10209	10210	10211
10-24	NC	H2	2		10213	10214	
10-24	NC	H2	3		10217		
10-24	NC	H2	4	10220	10221	10222	10223
10-24	NC	H3	2		10225	10226	
10-24	NC	H3	3		10229	10230	
10-24	NC	H3	4	10232	10233	10234	10235
10-24	NC	H7	3		10237	10238	
10-24	NC	H7	4		10241	10242	
10-32	NF	H1	2		10245	10246	
10-32	NF	H1	3		10249		
10-32	NF	H1	4	10252	10253	10254	10255
10-32	NF	H2	2		10257	10258	
10-32	NF	H2	3		10261	10262	
10-32	NF	H2	4	10264	10265	10266	10267
10-32	NF	H3	2		10269	10270	
10-32	NF	H3	3		10273	10274	
10-32	NF	H3	4	10276	10277	10278	10279
10-32	NF	H7	3		10281	10282	
10-32	NF	H7	4		10285	10286	
12-24	NC	H3	4	10288	10289	10290	10291
12-28	NF	H1	4		10293		
12-28	NF	H3	4	10296	10297	10298	10299

LIST 106

Hand High Speed Steel

THREAD FORM
American National

CHAMFER STYLE
Taper (7 to 10 threads), Plug (3 to 5 threads), Bottoming (1 to 2 threads)
If chamfer style is not specified, plug will be furnished



SIZE	NC NF NS	H-LIMIT	FLUTES	EDP NO. TAPER	PLUG	BOTTOM	SET
1/4-20	NC	H1	3		10301		
1/4-20	NC	H1	4	10304	10305	10306	10307
1/4-20	NC	H2	3		10309		
1/4-20	NC	H2	4	10311	10312	10313	10314
1/4-20	NC	H3	2		10316	10317	
1/4-20	NC	H3	3		10320	10321	
1/4-20	NC	H3	4	10323	10324	10325	10326
1/4-20	NC	H5	3		10328	10329	
1/4-20	NC	H5	4		10332	10333	
1/4-28	NF	H1	4		10336	10337	
1/4-28	NF	H2	4		10340	10341	
1/4-28	NF	H3	2		10344	10345	
1/4-28	NF	H3	3		10348	10349	
1/4-28	NF	H3	4	10351	10352	10353	10354
1/4-28	NF	H4	4		10356	10357	

continued

continued

Hand
High Speed Steel

SIZE	NC NF NS	H-LIMIT	FLUTES	EDP NO. TAPER	PLUG	BOTTOM	SET
5/16-18	NC	H1	4	10359	10360	10361	
5/16-18	NC	H2	4	10363	10364	10365	10366
5/16-18	NC	H3	2		10368	10369	
5/16-18	NC	H3	3		10372	10373	
5/16-18	NC	H3	4	10375	10376	10377	10378
5/16-18	NC	H5	3		10380	10381	
5/16-18	NC	H5	4		10384	10385	
5/16-24	NF	H1	4	10387	10388	10389	
5/16-24	NF	H2	4		10392	10393	
5/16-24	NF	H3	3		10396	10397	
5/16-24	NF	H3	4	10399	10400	10401	10402
5/16-24	NF	H4	4		10404	10405	
3/8-16	NC	H1	3		10408		
3/8-16	NC	H1	4		10411	10412	
3/8-16	NC	H2	4	10414	10415	10416	10417
3/8-16	NC	H3	3		10419	10420	
3/8-16	NC	H3	4	10422	10423	10424	10425
3/8-16	NC	H5	3		10427	10428	
3/8-16	NC	H5	4		10431	10432	
3/8-24	NF	H1	4	10434	10435	10436	
3/8-24	NF	H2	4		10439	10440	
3/8-24	NF	H3	3		10443	10444	
3/8-24	NF	H3	4	10446	10447	10448	10449
3/8-24	NF	H4	4		10451	10452	
7/16-14	NC	H1	4		10455	10456	
7/16-14	NC	H2	4		10459	10460	
7/16-14	NC	H3	3		10463		
7/16-14	NC	H3	4	10465	10466	10467	10468
7/16-14	NC	H5	4		10470	10471	
7/16-20	NF	H1	4		10474	10475	
7/16-20	NF	H2	4		10478	10479	
7/16-20	NF	H3	3		10482		
7/16-20	NF	H3	4	10484	10485	10486	10487
7/16-20	NF	H5	4		10489	10490	
1/2-13	NC	H1	4		10493	10494	
1/2-13	NC	H2	4		10497	10498	
1/2-13	NC	H3	3		10501	10502	
1/2-13	NC	H3	4	10504	10505	10506	10507
1/2-13	NC	H5	4		10509	10510	
1/2-20	NF	H1	4	10512	10513	10514	
1/2-20	NF	H2	4		10517	10518	
1/2-20	NF	H3	3		10521		
1/2-20	NF	H3	4	10523	10524	10525	10526
1/2-20	NF	H5	4		10528	10529	
9/16-12	NC	H2	4		10532		
9/16-12	NC	H3	4	10535	10536	10537	10538
9/16-12	NC	H5	4		10540	10541	
9/16-18	NF	H2	4		10544		
9/16-18	NF	H3	4	10546	10547	10548	10549
9/16-18	NF	H5	4		10551	10552	

continued

HIGH SPEED STEEL / GROUND THREAD

LIST 106 *continued*

Hand
High Speed Steel

SIZE	NC NF NS	H-LIMIT	FLUTES	EDP NO. TAPER	PLUG	BOTTOM	SET
5/8-11	NC	H1	4		10555		
5/8-11	NC	H2	4		10558		
5/8-11	NC	H3	4	10561	10562	10563	10564
5/8-11	NC	H5	4		10566	10567	
5/8-18	NF	H1	4		10570		
5/8-18	NF	H2	4		10574	10575	
5/8-18	NF	H3	4	10577	10578	10579	10580
5/8-18	NF	H5	4		10582	10583	
11/16-11	NS	H3	4	10585	10586	10587	10588
11/16-16	NS	H3	4	10589	10590	10591	10592
3/4-10	NC	H1	4		10594		
3/4-10	NC	H2	4		10597		
3/4-10	NC	H3	4	10600	10601	10602	10603
3/4-10	NC	H5	4		10605	10606	
3/4-16	NF	H1	4		10609		
3/4-16	NF	H2	4		10612		
3/4-16	NF	H3	4	10615	10616	10617	10618
3/4-16	NF	H5	4		10620	10621	
7/8-9	NC	H2	4		10624		
7/8-9	NC	H4	4	10626	10627	10628	10629
7/8-9	NC	H6	4		10631		
7/8-14	NF	H2	4		10634		
7/8-14	NF	H4	4	10636	10637	10638	10639
7/8-14	NF	H6	4		10641		
1-8	NC	H2	4		10644		
1-8	NC	H4	4	10646	10647	10648	10649
1-8	NC	H6	4		10651		
1-12	NF	H4	4	10653	10654	10655	10656
1-14	NS	H2	4		10658		
1-14	NS	H4	4	10660	10661	10662	10663
1-14	NS	H6	4	10664	10665	10666	
1-1/8-7	NC	H4	4	10668	10669	10670	10671
1-1/8-12	NF	H4	4	10672	10673	10674	10675
1-1/4-7	NC	H4	4	10676	10677	10678	10679
1-1/4-12	NF	H4	6	10680	10681	10682	10683
1-3/8-6	NC	H4	4	10684	10685	10686	10687
1-3/8-12	NF	H4	6	10688	10689	10690	10691
1-1/2-6	NC	H4	4	10692	10693	10694	10695
1-1/2-12	NF	H4	6	10696	10697	10698	10699

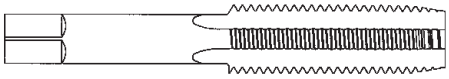
The geometry of these taps is specifically designed for cast iron or irons producing small or powdery chips. They will also work well in Bakelite, cast brass and other brasses which produce similar chips. They can be used by hand or under power, in through or blind holes. The chips are retained in the flutes during use. They are provided with a Nitride and Oxide surface treatment to retard wear and prolong tool life. See Table 302 on Page 33 for tap dimensions.

LIST 107

Hand, For Cast Iron High Speed Steel

THREAD FORM
American National

CHAMFER STYLE
Plug (3 to 5 threads), Bottoming (1 to 2 threads)
If chamfer style is not specified, plug will be furnished



SIZE	NC NF NS	H-LIMIT	FLUTES	EDP NO. PLUG	EDP NO. BOTTOM
1/4-20	NC	H3	4	10716	10717
1/4-20	NC	H5	4	10718	10719
1/4-28	NF	H3	4	10720	10721
5/16-18	NC	H3	4	10724	10725
5/16-18	NC	H5	4	10726	10727
5/16-24	NF	H3	4	10728	10729
3/8-16	NC	H3	4	10732	10733
3/8-16	NC	H5	4	10734	10735
3/8-24	NF	H3	4	10736	10737
7/16-14	NC	H3	4	10740	10741
7/16-14	NC	H5	4	10742	10743
7/16-20	NF	H3	4	10744	10745
1/2-13	NC	H3	4	10748	10749
1/2-13	NC	H5	4	10750	10751
1/2-20	NF	H3	4	10752	10753
9/16-12	NC	H3	4	10756	10757
9/16-18	NF	H3	4	10760	10761
5/8-11	NC	H3	4	10764	10765
5/8-11	NC	H5	4	10766	10767
5/8-18	NF	H3	4	10768	10769
3/4-10	NC	H3	4	10772	10773
3/4-10	NC	H5	4	10774	10775
3/4-16	NF	H3	4	10776	10777

Nitride and Steam Oxide Treated

SIZE	PITCH	D-LIMIT	FLUTES	EDP NO. PLUG	EDP NO. BOTTOM
M6	1.0	GD5	4	23138	23139
M8	1.25	GD5	4	23140	23141
M10	1.5	GD6	4	23142	23143
M12	1.75	GD6	4	23144	23145

Bright Finish

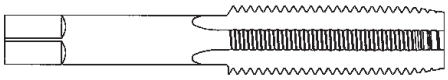
SIZE	PITCH	D-LIMIT	FLUTES	EDP NO. PLUG	EDP NO. BOTTOM
M6	1.0	GD5	4	23158	23159
M8	1.25	GD5	4	23160	23161
M10	1.5	GD6	4	23162	23163
M12	1.75	GD6	4	23164	23165

These general purpose taps can be used by hand or under power, in through or blind holes and are suitable for tapping most materials. The chips are retained in the flutes during use. A variety of surface treatments are available to improve performance. See Page 49 for recommendations. See Table 302 on Page 33 for tap dimensions.

LIST 108 Hand, Eight Pitch Series High Speed Steel

THREAD FORM
American National

CHAMFER STYLE
Taper (7 to 10 threads), Plug (3 to 5 threads), Bottoming (1 to 2 threads)
If chamfer style is not specified, plug will be furnished



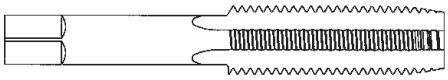
SIZE	NC NF NS	H-LIMIT	FLUTES	EDP NO. TAPER	PLUG	BOTTOM	SET
1-1/8-8	N	H5	4	10800	10801	10802	
1-1/4-8	N	H5	4	10804	10805	10806	
1-3/8-8	N	H5	4	10808	10809	10810	
1-1/2-8	N	H5	6	10812	10813	10814	
1-5/8-8	N	H6	6	10816	10817	10818	
1-3/4-8	N	H6	6	10820	10821	10822	
1-7/8-8	N	H6	6	10824	10825	10826	
2-8	N	H6	6	10828	10829	10830	
2-1/4-8	N	H6	6	10832	10833	10834	
2-1/2-8	N	H6	6	10836	10837	10838	

These taps will produce threads with a pitch diameter which is .005 larger than the basic pitch diameter. They are used primarily where the part will be plated or heat treated after tapping or where loss of size, for any reason, is anticipated. They can be used by hand or under power, in through or blind holes and are suitable for tapping most materials. The chips are retained in the flutes during use. A variety of surface treatments are available to improve performance. See Page 49 for recommendations. See Table 302 on Page 33 for tap dimensions.

LIST 109 Hand, .005 Oversize High Speed Steel

THREAD FORM
American National

CHAMFER STYLE
Plug (3 to 5 threads)



SIZE	NC NF NS	H-LIMIT	FLUTES	EDP NO. PLUG	BOTTOM
1/4-20	NC	H11	4	10940	
5/16-18	NC	H11	4	10946	
3/8-16	NC	H11	4	10950	
7/16-14	NC	H11	4	10954	
1/2-13	NC	H11	4	10958	
5/8-11	NC	H11	4	10966	

These taps are primarily designed for tapping through holes, however, they can also be used in blind holes which are deep enough to allow for chip accumulation in the bottom of the hole. The spiral point forces the chips ahead of the tap, thereby preventing clogging and recutting of chips. Long holes, in excess of 1-1/2 diameters, can be tapped as a result. They can be used by hand or under power and are suitable for tapping most materials, especially those with high ductility. A variety of surface treatments are available to improve performance. See Page 49 for recommendations. See Table 302 on Page 33 for tap dimensions.

LIST 110

Spiral Pointed, Plug High Speed Steel

THREAD FORM
American National

CHAMFER STYLE
Plug (3 to 5 threads)

SIZE	NC NF NS	H-LIMIT	FLUTES	EDP NO. TAPER	PLUG	BOTTOM	SET
0-80	NF	H1	2		11000		
0-80	NF	H2	2		11001		
1-64	NC	H1	2		11002		
1-64	NC	H2	2		11003		
1-72	NF	H1	2		11004		
1-72	NF	H2	2		11005		
2-56	NC	H1	2		11006		
2-56	NC	H2	2		11007		
2-64	NF	H1	2		11008		
2-64	NF	H2	2		11009		
3-48	NC	H1	2		11010		
3-48	NC	H2	2		11011		
3-56	NF	H1	2		11012		
3-56	NF	H2	2		11013		
4-40	NC	H1	2		11014		
4-40	NC	H2	2		11015		
4-48	NF	H1	2		11016		
4-48	NF	H2	2		11017		
4-36	NS	H2	2		11018		
5-40	NC	H1	2		11019		
5-40	NC	H2	2		11020		
5-44	NF	H2	2		11021		
6-32	NC	H1	2		11022		
6-32	NC	H2	2		11023		
6-32	NC	H3	2		11024		
6-32	NC	H7	2		11025		
6-40	NF	H1	2		11026		
6-40	NF	H2	2		11027		
8-32	NC	H1	2		11028		
8-32	NC	H2	2		11029		
8-32	NC	H3	2		11030		
8-32	NC	H7	2		11031		
8-36	NF	H1	2		11032		
8-36	NF	H2	2		11033		
10-24	NC	H1	2		11034		
10-24	NC	H2	2		11035		
10-24	NC	H3	2		11036		
10-24	NC	H7	2		11037		
10-32	NF	H1	2		11038		
10-32	NF	H2	2		11039		
10-32	NF	H3	2		11040		
10-32	NF	H7	2		11041		
12-24	NC	H1	2		11042		
12-24	NC	H3	2		11043		
12-28	NF	H3	2		11044		

continued

LIST 110 *continued*

Spiral Pointed, Plug
High Speed Steel

SIZE	NC NF NS	H-LIMIT	FLUTES	EDP NO. TAPER	PLUG	BOTTOM	SET
1/4-20	NC	H1	2		11045		
1/4-20	NC	H2	2		11046		
1/4-20	NC	H3	2		11047		
1/4-20	NC	H3	3		11048		
1/4-20	NC	H5	2		11049		
1/4-20	NC	H5	3		11050		
1/4-28	NF	H1	2		11051		
1/4-28	NF	H2	2		11052		
1/4-28	NF	H2	3		11053		
1/4-28	NF	H3	2		11054		
1/4-28	NF	H4	2		11055		
1/4-28	NF	H4	3		11056		
5/16-18	NC	H1	2		11057		
5/16-18	NC	H2	2		11058		
5/16-18	NC	H3	2		11059		
5/16-18	NC	H3	3		11060		
5/16-18	NC	H5	2		11061		
5/16-18	NC	H5	3		11062		
5/16-24	NF	H1	2		11063		
5/16-24	NF	H2	2		11064		
5/16-24	NF	H2	3		11065		
5/16-24	NF	H3	2		11066		
5/16-24	NF	H4	2		11067		
5/16-24	NF	H4	3		11068		
3/8-16	NC	H1	3		11069		
3/8-16	NC	H2	3		11070		
3/8-16	NC	H3	3		11071		
3/8-16	NC	H5	3		11072		
3/8-24	NF	H1	3		11073		
3/8-24	NF	H2	3		11074		
3/8-24	NF	H3	3		11075		
3/8-24	NF	H4	3		11076		
7/16-14	NC	H2	3		11077		
7/16-14	NC	H3	3		11078		
7/16-14	NC	H5	3		11079		
7/16-20	NF	H2	3		11080		
7/16-20	NF	H3	3		11081		
7/16-20	NF	H5	3		11082		
1/2-13	NC	H1	3		11083		
1/2-13	NC	H2	3		11084		
1/2-13	NC	H3	3		11085		
1/2-13	NC	H5	3		11086		
1/2-20	NF	H1	3		11087		
1/2-20	NF	H2	3		11088		
1/2-20	NF	H3	3		11089		
1/2-20	NF	H5	3		11090		
9/16-12	NC	H3	3		11091		
9/16-18	NF	H3	3		11092		
5/8-11	NC	H3	3		11093		
5/8-11	NC	H5	3		11094		
5/8-18	NF	H3	3		11095		
3/4-10	NC	H3	3		11096		
3/4-10	NC	H5	3		11097		
3/4-16	NF	H3	3		11098		

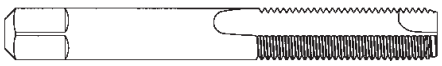
These taps are primarily designed for tapping short, blind holes which require full threads close to the bottom of the hole. While the spiral point pushes chips into the hole, removal of the male center creates additional chip space at the front of the tap to accommodate these chips. The thicker chip, resulting from the short chamfer, tends to break up rather than be long and stringy. They can be used by hand or under power and are suitable for tapping most materials, especially those with high ductility. A variety of surface treatments are available to improve performance. See Page 49 for recommendations. See Table 302 on Page 33 for tap dimensions.

LIST 112

Spiral Pointed, Bottom High Speed Steel

THREAD FORM
American National

CHAMFER STYLE
Bottoming (1 to 2 threads)



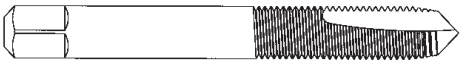
SIZE	NC NF NS	H-LIMIT	FLUTES	EDP NO. TAPER	PLUG	BOTTOM	SET
0-80	NF	H1	2			11200	
0-80	NF	H2	2			11201	
1-64	NC	H2	2			11203	
1-72	NF	H2	2			11205	
2-56	NC	H1	2			11206	
2-56	NC	H2	2			11207	
3-48	NC	H2	2			11211	
3-56	NF	H2	2			11213	
4-40	NC	H1	2			11214	
4-40	NC	H2	2			11215	
4-48	NF	H2	2			11217	
5-40	NC	H2	2			11220	
5-44	NF	H2	2			11221	
6-32	NC	H1	2			11222	
6-32	NC	H2	2			11223	
6-32	NC	H3	2			11224	
6-32	NC	H7	2			11225	
6-40	NF	H2	2			11227	
8-32	NC	H1	2			11228	
8-32	NC	H2	2			11229	
8-32	NC	H3	2			11230	
8-32	NC	H7	2			11231	
8-36	NF	H2	2			11233	
10-24	NC	H1	2			11234	
10-24	NC	H2	2			11235	
10-24	NC	H3	2			11236	
10-32	NF	H1	2			11238	
10-32	NF	H2	2			11239	
10-32	NF	H3	2			11240	
12-24	NC	H3	2			11243	
1/4-20	NC	H3	2			11247	
1/4-28	NF	H3	2			11254	
5/16-18	NC	H3	2			11259	
5/16-24	NF	H3	2			11266	

These taps are primarily designed for tapping short through holes, of one diameter or less, under high torque conditions. They also work well when tapping two legs of a U-shaped part where thread alignment and continuity are important. The spiral point forces the chips ahead of the tap, thereby preventing clogging and recutting of chips. They can be used by hand or under power and are suitable for tapping most materials, especially those with high ductility. A variety of surface treatments are available to improve performance. See Page 49 for recommendations. See Table 302 on Page 33 for tap dimensions.

LIST 114 Spiral Pointed, Fluteless High Speed Steel

THREAD FORM
American National

CHAMFER STYLE
Plug (3 to 5 threads)



SIZE	NC NF NS	H-LIMIT	GASHES	EDP NO. TAPER	PLUG	BOTTOM	SET
4-40	NC	H2	2		11415		
5-40	NC	H2	2		11420		
6-32	NC	H3	2		11424		
8-32	NC	H3	2		11430		
10-24	NC	H3	2		11436		
10-32	NF	H3	2		11440		
12-24	NC	H3	2		11443		
1/4-20	NC	H3	2		11447		
5/16-18	NC	H3	2		11459		
3/8-16	NC	H3	3		11471		
1/2-13	NC	H3	3		11485		

These taps will produce threads with a pitch diameter which is .005 larger than the basic pitch diameter. They are used primarily where the part will be plated or heat treated after tapping or where loss of size, for any reason, is anticipated. The spiral point forces the chips ahead of the tap, thereby preventing clogging and recutting of chips. Long holes, in excess of 1-1/2 diameters, can be tapped as a result. They can be used by hand or under power and are suitable for tapping most materials, especially those with high ductility. A variety of surface treatments are available to improve performance. See Page 49 for recommendations. See Table 302 on Page 33 for tap dimensions.

LIST 117 Spiral Pointed, Plug, .005 Oversize High Speed Steel

THREAD FORM
American National

CHAMFER STYLE
Plug (3 to 5 threads)

SIZE	NC NF NS	H-LIMIT	FLUTES	EDP NO. PLUG	BOTTOM
1/4-20	NC	H11	2	11749	
5/16-18	NC	H11	2	11761	
3/8-16	NC	H11	3	11772	
7/16-14	NC	H11	3	11779	
1/2-13	NC	H11	3	11786	
5/8-11	NC	H11	3	11794	

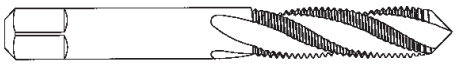
These taps are primarily designed for tapping blind holes. The spiral flutes draw the chips out of the hole, thereby preventing clogging and recutting of chips. Spiral flutes will also effectively bridge a keyway, or slot inside the hole, without binding. These taps can be used by hand or under power and are suitable for tapping most materials, especially mild steel and brass. A variety of surface treatments are available to improve performance. See Page 49 for recommendations. See Table 302 on Page 33 for tap dimensions.

LIST 118

Spiral Fluted, 30° Helix High Speed Steel

THREAD FORM
American National

CHAMFER STYLE
Plug (3 to 5 threads), Bottoming (1 to 2 threads)
If chamfer style is not specified, plug will be furnished



SIZE	NC NF NS	H-LIMIT	FLUTES	EDP NO. TAPER	PLUG	BOTTOM	SET
4-40	NC	H2	2		11806	11807	
5-40	NC	H2	2		11810	11811	
6-32	NC	H3	2		11814	11815	
8-32	NC	H3	2		11822	11823	
10-24	NC	H3	2		11826	11827	
10-32	NF	H3	2		11830	11831	
1/4-20	NC	H3	2		11838	11839	
1/4-28	NF	H3	2		11842	11843	
5/16-18	NC	H3	3		11846	11847	
5/16-24	NF	H3	3		11850	11851	
3/8-16	NC	H3	3		11854	11855	
3/8-24	NF	H3	3		11858	11859	
7/16-14	NC	H3	3		11862	11863	
7/16-20	NF	H3	3		11866	11867	
1/2-13	NC	H3	3		11870	11871	
1/2-20	NF	H3	3		11874	11875	

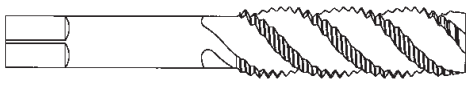
These taps are primarily designed for tapping blind holes and preferred for tapping relatively deep ones. The high spiral flutes draw the chips out of the hole at a faster rate, thereby preventing clogging and recutting of chips. Spiral flutes will also effectively bridge a keyway, or slot inside the hole, without binding. These taps can be used by hand or under power and are suitable for tapping most materials, especially mild steel, aluminum, magnesium, copper and brass. A variety of surface treatments are available to improve performance. See Page 49 for recommendations. See Table 302 on Page 33 for tap dimensions.

LIST 120

Spiral Fluted, 50° Helix High Speed Steel

THREAD FORM
American National

CHAMFER STYLE
Plug (3 to 5 threads), Bottoming (1 to 2 threads)
If chamfer style is not specified, plug will be furnished



SIZE	NC NF NS	H-LIMIT	FLUTES	EDP NO. TAPER	PLUG	BOTTOM	SET
3-48	NC	GH2	2		12002	12003	
3-56	NF	GH2	2		---	12000	
4-40	NC	GH1	2		12001	12004	
4-40	NC	GH2	2		12006	12007	
4-48	NF	GH2	2		---	12005	
5-40	NC	GH1	2		12008	12009	
5-40	NC	GH2	2		12010	12011	
5-44	NF	GH2	2		---	12012	
6-32	NC	GH1	2		12013	12016	
6-32	NC	GH3	2		12014	12015	
6-40	NF	GH2	2		---	12017	
8-32	NC	GH1	3		12018	12019	

continued

LIST 120 *continued*

Spiral Fluted, 50° Helix High Speed Steel

SIZE	NC NF NS	H-LIMIT	FLUTES	EDP NO. TAPER	PLUG	BOTTOM	SET
8-32	NC	GH3	3		12022	12023	
8-36	NF	GH3	3		12020	12021	
10-24	NC	GH1	3		12024	12025	
10-24	NC	GH3	3		12026	12027	
10-32	NF	GH1	3		12028	12029	
10-32	NF	GH3	3		12030	12031	
12-24	NC	GH3	3		12034	12035	
12-28	NF	GH3	3		12032	12033	
1/4-20	NC	GH1	3		12036	12037	
1/4-20	NC	GH3	3		12038	12039	
1/4-20	NC	GH5	3		12040	12041	
1/4-28	NF	GH1	3		12044	12045	
1/4-28	NF	GH3	3		12042	12043	
5/16-18	NC	GH1	3		12048	12049	
5/16-18	NC	GH3	3		12046	12047	
5/16-18	NC	GH5	3		12052	12053	
5/16-24	NF	GH1	3		12056	12057	
5/16-24	NF	GH3	3		12050	12051	
3/8-16	NC	GH1	3		12060	12061	
3/8-16	NC	GH3	3		12054	12055	
3/8-16	NC	GH5	3		12064	12065	
3/8-24	NF	GH1	3		12068	12069	
3/8-24	NF	GH3	3		12058	12059	
7/16-14	NC	GH1	3		12072	12073	
7/16-14	NC	GH3	3		12062	12063	
7/16-14	NC	GH5	3		12076	12077	
7/16-20	NF	GH1	3		12078	12079	
7/16-20	NF	GH3	3		12066	12067	
7/16-20	NF	GH5	3		12081	12082	
1/2-13	NC	GH1	3		12083	12084	
1/2-13	NC	GH3	3		12070	12071	
1/2-13	NC	GH5	3		12085	12086	
1/2-20	NF	GH1	3		12087	12088	
1/2-20	NF	GH3	3		12074	12075	
1/2-20	NF	GH5	3		12089	12091	
9/16-12	NC	GH3	4		12092	12093	
9/16-18	NF	GH3	4		12094	12096	
5/8-11	NC	GH3	4		12097	12098	
5/8-11	NC	GH5	4		12099	12141	
5/8-18	NF	GH1	4		12142	12151	
5/8-18	NF	GH3	4		12152	12153	
3/4-10	NC	GH3	4		12154	12155	
3/4-10	NC	GH5	4		12156	12157	
3/4-16	NF	GH1	4		12158	12159	
3/4-16	NF	GH3	4		12160	12161	

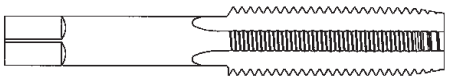
These taps will produce threads with a pitch diameter which is slightly more than two thread heights larger than the basic pitch diameter. This allows for the installation of a screw thread insert. Inserts are primarily used in soft material which is prone to thread stripping or to repair damaged threads. These taps can be used by hand or under power, in through or blind holes and are suitable for tapping most materials. The chips are retained in the flutes during use. A variety of surface treatments are available to improve performance. See Page 49 for recommendations. See Table 302 on Page 33 for tap dimensions.

LIST 122

Machine Screw & Hand, Screw Thread Insert High Speed Steel

THREAD FORM
American National

CHAMFER STYLE
Plug (3 to 5 threads), Bottoming (1 to 2 threads)
If chamfer style is not specified, plug will be furnished



SIZE	NC NF NS	H-LIMIT	FLUTES	EDP NO. PLUG	EDP NO. BOTTOM
4-40	NC	H1	3	12204	12205
5-40	NC	H1	3	12210	12211
6-32	NC	H2	3	12214	12215
6-32	NC	H3	3	12216	12217
6-40	NF	H1	3	12218	12219
8-32	NC	H2	3	12220	12221
8-32	NC	H3	3	12222	12223
10-24	NC	H2	3	12226	12227
10-24	NC	H3	3	12228	12229
10-32	NF	H2	3	12230	12231
10-32	NF	H3	3	12232	12233
12-24	NC	H2	3	12234	12235
12-24	NC	H3	3	12236	12237
1/4-20	NC	H2	3	12238	12239
1/4-20	NC	H3	3	12240	12241
1/4-28	NF	H2	3	12242	12243
1/4-28	NF	H3	3	12244	12245
5/16-18	NC	H3	4	12246	12247
5/16-24	NF	H2	4	12248	12249
3/8-16	NC	H3	4	12250	12251
3/8-24	NF	H2	4	12252	12253
7/16-14	NC	H3	4	12254	12255
7/16-20	NF	H3	4	12256	12257
1/2-13	NC	H3	4	12258	12259
1/2-20	NF	H3	4	12260	12261

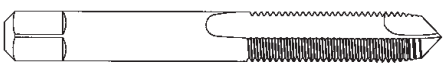
These taps will produce threads with a pitch diameter which is slightly more than two thread heights larger than the basic pitch diameter. This allows for the installation of a screw thread insert. Inserts are primarily used in soft material which is prone to thread stripping or to repair damaged threads. The spiral point forces the chips ahead of the tap, thereby preventing clogging and recutting of chips. Long holes, in excess of 1-1/2 diameters, can be tapped as a result. They can be used by hand or under power and are suitable for tapping most materials, especially those with high ductility. A variety of surface treatments are available to improve performance. See Page 49 for recommendations. See Table 302 on Page 33 for tap dimensions.

LIST 123

Spiral Pointed, Screw Thread Insert High Speed Steel

THREAD FORM
American National

CHAMFER STYLE
Plug (3 to 5 threads)



SIZE	NC NF NS	H-LIMIT	FLUTES	EDP NO. PLUG	EDP NO. BOTTOM
4-40	NC	H1	2	12315	
5-40	NC	H1	2	12320	
6-32	NC	H2	2	12324	
6-40	NF	H1	2	12327	
8-32	NC	H2	2	12330	
10-24	NC	H2	2	12336	
10-32	NF	H2	2	12340	
12-24	NC	H2	2	12343	
1/4-20	NC	H2	2	12347	
1/4-28	NF	H2	2	12354	
5/16-18	NC	H3	3	12360	
5/16-24	NF	H2	3	12368	
3/8-16	NC	H3	3	12371	
3/8-24	NF	H2	3	12375	
7/16-14	NC	H3	3	12378	
7/16-20	NF	H3	3	12381	
1/2-13	NC	H3	3	12385	
1/2-20	NF	H3	3	12389	

HIGH SPEED STEEL / GROUND THREAD

True Lead Forming Taps do not cut threads, rather, they cold form threads, displacing material from the major diameter toward the minor diameter. They will not function in materials of low ductility, however, they are extremely effective in ductile materials such as aluminum, copper, brass, leaded steels, low carbon steels and stainless steels. These taps must be run under power and usually at speeds of 150% to 200% in excess of cutting taps. Because the tap usually displaces metal above the mouth of the hole, countersinking, before or after tapping, is recommended. Since the hole diameter is reduced by the forming process, a larger tap drill is required for a forming tap than for a cutting tap. See Pages 47 and 48 for tap drill sizes. A variety of surface treatments are available to improve performance. See Page 49 for recommendations. See Table 302 on Page 33 for tap dimensions.

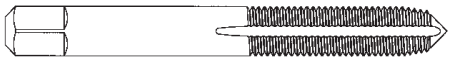
LIST 124

Thread Forming, True Lead High Speed Steel

THREAD FORM
American National

POINT STYLE
Plug (3 to 5 threads), Bottoming (1 to 2-1/2 threads)
If point style is not specified, plug will be furnished

NOTE: Forming taps require larger holes than cutting taps. See page 47 for tap drill sizes.



SIZE	NC NF NS	H-LIMIT	EDP NO. PLUG	EDP NO. BOTTOM
0-80	NF	H2	12400	12401
0-80	NF	H3	15500	15501
1-64	NC	H2		12403
1-72	NF	H2		12405
2-56	NC	H2	12406	12407
2-56	NC	H3	12408	12409
2-64	NF	H2		12411
2-64	NF	H3		12413
3-48	NC	H2		15547
3-48	NC	H3		12415
3-56	NF	H2		15557
3-56	NF	H3		12417
4-40	NC	H3	12418	12419
4-40	NC	H5	12420	12421
4-48	NF	H3	12422	12423
4-48	NF	H5	15578	15579
5-40	NC	H3	12424	12425
5-40	NC	H5	12426	12427
5-44	NF	H3	12428	12429
5-44	NF	H5	15594	15595
6-32	NC	H3	12432	12433
6-32	NC	H5	12434	12435
6-32	NC	H7	15606	15607
6-40	NF	H3	12436	12437
6-40	NF	H5	12438	12439
8-32	NC	H3	12440	12441
8-32	NC	H5	12442	12443
8-32	NC	H7	15634	15635
8-36	NF	H3	12444	12445
10-24	NC	H4	12448	12449
10-24	NC	H6	12450	12451
10-32	NF	H4	12452	12453
10-32	NF	H6	12454	12455
12-24	NC	H4	12456	12457
12-24	NC	H6	12458	12459
12-28	NF	H4	12460	12461
1/4-20	NC	H3	15716	15717
1/4-20	NC	H4	12462	12463
1/4-20	NC	H6	12464	12465
1/4-28	NF	H4	12466	12467

continued

LIST 124

continued

Thread Forming, True Lead High Speed Steel

SIZE	NC NF NS	H-LIMIT	EDP NO. PLUG	EDP NO. BOTTOM
1/4-28	NF	H6	15734	15735
5/16-18	NC	H5	12468	12469
5/16-18	NC	H7	12470	12471
5/16-24	NF	H5	12472	12473
5/16-24	NF	H7	12474	12475
3/8-16	NC	H5	12476	12477
3/8-16	NC	H7	12478	12479
3/8-24	NF	H5	12480	12481
3/8-24	NF	H7	12482	12483
7/16-14	NC	H5	12484	12485
7/16-14	NC	H8	12486	12487
7/16-20	NF	H5	12488	12489
7/16-20	NF	H8	15834	15835
1/2-13	NC	H5	12492	12493
1/2-13	NC	H8	12494	12495
1/2-20	NF	H5	12496	12497
1/2-20	NF	H8	15870	15871
9/16-12	NC	H7	15886	15887
9/16-12	NC	H10	15892	15893
9/16-18	NF	H7	15904	15905
9/16-18	NF	H10	15910	15911
5/8-11	NC	H7	15924	15925
5/8-11	NC	H10	15930	15931
5/8-18	NF	H7	15948	15949
5/8-18	NF	H10	15954	15955
3/4-10	NC	H7	15972	15973
3/4-10	NC	H10	15978	15979
3/4-16	NF	H7	15996	15997
3/4-16	NF	H10	16002	16003

LIST 124M

Thread Forming, True Lead, Metric High Speed Steel

SIZE	PITCH	D-LIMIT	EDP NO. PLUG	EDP NO. BOTTOM
M3	.50	D5	16464	16465
M4	.70	D6	16466	16467
M5	.80	D7	16468	16469
M6	1.00	D8	16470	16471
M8	1.25	D9	16472	16473
M10	1.50	D10	16474	16475
M12	1.75	D11	16476	16477

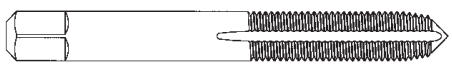
THREAD FORM

M-Profile

POINT STYLE

Plug (3 to 5 threads), Bottoming (1 to 2-1/2 threads)
If point style is not specified, plug will be furnished

NOTE: Forming taps require larger holes than cutting taps. See page 48 for tap drill sizes.

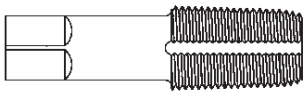


LIST 124T

Thread Forming, True Lead, Taper Pipe High Speed Steel

THREAD FORM
American Standard NPT

POINT STYLE
Standard (2 to 3-1/2 threads)



SIZE	TYPE	EDP NO.
1/16-27	NPT	16800
1/8-27*	NPT	16801
1/8-27	NPT	16802
1/4-18	NPT	16803
3/8-18	NPT	16804
1/2-14	NPT	16805
3/4-14	NPT	16806

*Small Shank

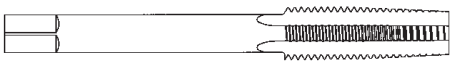
These taps are designed to tap nuts. They have a very long chamfer, which produces low chip loads. The tap is not reversed and the nuts pass on to the long shank where they accumulate. When the shank becomes loaded with nuts, the tap is removed and the nuts are dumped from the shank. A variety of surface treatments are available to improve performance. See Page 49 for recommendations.

LIST 126

Nut High Speed Steel

THREAD FORM
American National

CHAMFER STYLE
Standard(16 to 24 threads)



SIZE	NC NF NS	H-LIMIT	FLUTES	EDP NO. TAPER	PLUG	BOTTOM	SET
1/4-20	NC	H3	4	12622			
5/16-18	NC	H3	4	12630			
3/8-16	NC	H3	4	12638			
1/2-13	NC	H3	4	12654			

These taps are designed to tap the set screw thread in pulley hubs. The various lengths allow the machine spindle to clear the pulley sheave. They can also be used as extension taps in many applications. The shank diameter is usually sized only for the chucking length. A variety of surface treatments are available to improve performance. See Page 49 for recommendations.

LIST 127

Pulley
High Speed Steel

SIZE	NC NF NS	H-LIMIT	FLUTES	EDP NO. 6" LENGTH	EDP NO. 8" LENGTH	EDP NO. 10" LENGTH	EDP NO. 12" LENGTH	THREAD LENGTH
1/4-20	NC	H3	4	12722	12723			1
5/16-18	NC	H3	4	12730	12731			1-1/8
3/8-16	NC	H3	4	12738	12739	12740		1-1/4
7/16-14	NC	H3	4	12746	12747			1-7/16
1/2-13	NC	H3	4	12754	12755	12756	12757	1-21/32
5/8-11	NC	H3	4	12762	12763	12764	12765	1-13/16
3/4-10	NC	H3	4			12772	12773	2

THREAD FORM
American National

CHAMFER STYLE
Plug (3 to 5 threads)

The geometry of these taps is specifically designed for cast iron or irons producing small or powdery chips. They will also work well in cast brass and other brasses which produce similar chips. The chips are retained in the flutes during use. Assembly of NPT threads requires a sealant such as Teflon tape or pipe joint compound. Nominal tap size is based upon the fitting size, not the actual size of the tap. See Page 36 for tap drill and reaming data. They are provided with a Nitride and Oxide surface treatment to retard wear and prolong tool life. See Table 311 on Page 34 for tap dimensions.

LIST 130

Taper Pipe, Regular, For Cast Iron
High Speed Steel

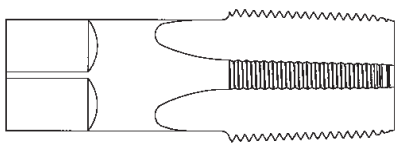
SIZE	TYPE	FLUTES	EDP NO.
1/8-27	NPT	4	13002
1/8-27*	NPT	4	13004
1/4-18	NPT	4	13006
3/8-18	NPT	4	13008
1/2-14	NPT	4	13010
3/4-14	NPT	5	13012
1-11-1/2	NPT	5	13014
1-1/4-11-1/2	NPT	5	13016
1-1/2-11-1/2	NPT	7	13018
2-11-1/2	NPT	7	13020

*Small Shank

THREAD FORM
American Standard NPT, Regular

CHAMFER STYLE
Standard (2 to 3-1/2 threads)

SHANK
Unless otherwise specified, orders for 1/8" pipe taps will be filled with taps having a large shank



The geometry of these taps is specifically designed for cast iron or irons producing small or powdery chips. They will also work well in cast brass and other brasses which produce similar chips. The chips are retained in the flutes during use. Assembly of NPTF threads does not require sealants. Seal is attained by metal-to-metal contact. Nominal tap size is based upon the fitting size, not the actual size of the tap. See Page 36 for tap drill and reaming data. They are provided with a Nitride and Oxide surface treatment to retard wear and prolong tool life. See Table 311 on Page 34 for tap dimensions.

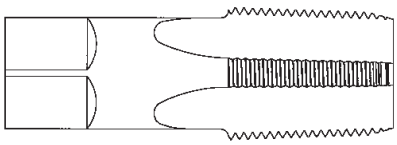
LIST 132

Taper Pipe, Dryseal, For Cast Iron High Speed Steel

THREAD FORM
American Standard NPTF, Dryseal

CHAMFER STYLE
Standard (2 to 3-1/2 threads)

SHANK
Unless otherwise specified, orders for 1/8" pipe taps will be filled with taps having a large shank



SIZE	TYPE	FLUTES	EDP NO.
1/8-27	NPTF	4	13202
1/8-27*	NPTF	4	13204
1/4-18	NPTF	4	13206
3/8-18	NPTF	4	13208
1/2-14	NPTF	4	13210
3/4-14	NPTF	5	13212
1-11-1/2	NPTF	5	13214
1-1/4-11-1/2	NPTF	5	13216
1-1/2-11-1/2	NPTF	7	13218
2-11-1/2	NPTF	7	13220

*Small Shank

These general purpose taps are suitable for tapping most materials. The chips are retained in the flutes during use. Assembly of NPT threads requires a sealant such as Teflon tape or pipe joint compound. Nominal tap size is based upon the fitting size, not the actual size of the tap. See Page 36 for tap drill and reaming data. A variety of surface treatments are available to improve performance. See Page 49 for recommendations. See Table 311 on Page 34 for tap dimensions.

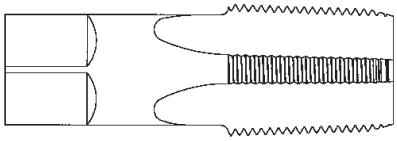
LIST 134

Taper Pipe, Regular High Speed Steel

THREAD FORM
American Standard NPT, Regular

CHAMFER STYLE
Standard (2 to 3-1/2 threads)

SHANK
Unless otherwise specified, orders for 1/8" pipe taps will be filled with taps having a large shank



SIZE	TYPE	FLUTES	EDP NO.
1/16-27	NPT	4	13400
1/8-27	NPT	4	13402
1/8-27*	NPT	4	13404
1/4-18	NPT	4	13406
3/8-18	NPT	4	13408
1/2-14	NPT	4	13410
3/4-14	NPT	5	13412
1-11-1/2	NPT	5	13414
1-1/4-11-1/2	NPT	5	13416
1-1/2-11-1/2	NPT	7	13418
2-11-1/2	NPT	7	13420

*Small Shank

Interrupted threads provide additional chip space, better coolant flow and reduce drag. These general purpose taps are suitable for tapping most materials. The chips are retained in the flutes during use. Assembly of NPT threads requires a sealant such as Teflon tape or pipe joint compound. Nominal tap size is based upon the fitting size, not the actual size of the tap. See Page 36 for tap drill and reaming data. A variety of surface treatments are available to improve performance. See Page 49 for recommendations. See Table 311 on Page 34 for tap dimensions.

LIST 136

Taper Pipe, Regular Interrupted Thread High Speed Steel

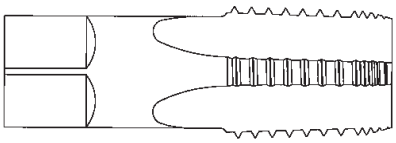
SIZE	TYPE	FLUTES	EDP NO.
1/8-27	NPT	5	13602
1/8-27*	NPT	5	13604
1/4-18	NPT	5	13606
3/8-18	NPT	5	13608
1/2-14	NPT	5	13610
3/4-14	NPT	5	13612
1-11-1/2	NPT	5	13614
1-1/4-11-1/2	NPT	5	13616
1-1/2-11-1/2	NPT	7	13618
2-11-1/2	NPT	7	13620

*Small Shank

THREAD FORM
American Standard NPT, Regular

CHAMFER STYLE
Standard (2 to 3-1/2 threads)

SHANK
Unless otherwise specified, orders for 1/8" pipe taps will be filled with taps having a large shank



These general purpose taps are suitable for tapping most materials. The chips are retained in the flutes during use. Assembly of NPTF threads does not require sealants. Seal is attained by metal-to-metal contact. Nominal tap size is based upon the fitting size, not the actual size of the tap. See Page 36 for tap drill and reaming data. A variety of surface treatments are available to improve performance. See Page 49 for recommendations. See Table 311 on Page 34 for tap dimensions.

LIST 138

Taper Pipe, Dryseal High Speed Steel

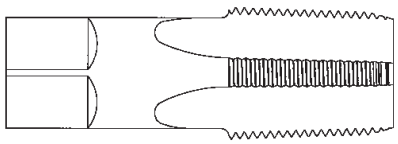
SIZE	TYPE	FLUTES	EDP NO.
1/16-27	NPTF	4	13800
1/8-27	NPTF	4	13802
1/8-27*	NPTF	4	13804
1/4-18	NPTF	4	13806
3/8-18	NPTF	4	13808
1/2-14	NPTF	4	13810
3/4-14	NPTF	5	13812
1-11-1/2	NPTF	5	13814
1-1/4-11-1/2	NPTF	5	13816
1-1/2-11-1/2	NPTF	7	13818
2-11-1/2	NPTF	7	13820

*Small Shank

THREAD FORM
American Standard NPTF, Dryseal

CHAMFER STYLE
Standard (2 to 3-1/2 threads)

SHANK
Unless otherwise specified, orders for 1/8" pipe taps will be filled with taps having a large shank



Interrupted threads provide additional chip space, better coolant flow and reduce drag. These general purpose taps are suitable for tapping most materials. The chips are retained in the flutes during use. Assembly of NPTF threads does not require sealants. Seal is attained by metal-to-metal contact. Nominal tap size is based upon the fitting size, not the actual size of the tap. See Page 36 for tap drill and reaming data. A variety of surface treatments are available to improve performance. See Page 49 for recommendations. See Table 311 on Page 34 for tap dimensions.

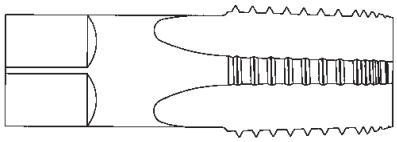
LIST 140

Taper Pipe, Dryseal, Interrupted Thread High Speed Steel

THREAD FORM
American Standard NPTF, Dryseal

CHAMFER STYLE
Standard (2 to 3-1/2 threads)

SHANK
Unless otherwise specified, orders for 1/8" pipe taps will be filled with taps having a large shank



SIZE	TYPE	FLUTES	EDP NO.
1/8-27	NPTF	5	14002
1/8-27*	NPTF	5	14004
1/4-18	NPTF	5	14006
3/8-18	NPTF	5	14008
1/2-14	NPTF	5	14010
3/4-14	NPTF	5	14012
1-11-1/2	NPTF	5	14014
1-1/4-11-1/2	NPTF	5	14016
1-1/2-11-1/2	NPTF	7	14018
2-11-1/2	NPTF	7	14020

*Small Shank

These taps produce threads that conform to military specification MIL-P-7105B. Gaging consists of two thread plug gages, L1 and L3, and a Plain Taper Plug Truncation Gage. The general form and dimensions are equivalent to NPT threads. These general purpose taps are suitable for tapping most materials. The chips are retained in the flutes during use. Assembly of ANPT threads requires a sealant such as Teflon tape or pipe joint compound. Nominal tap size is based upon the fitting size, not the actual size of the tap. See Page 36 for tap drill and reaming data. A variety of surface treatments are available to improve performance. See Page 49 for recommendations. See Table 311 on Page 34 for tap dimensions.

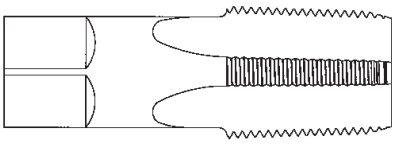
LIST 142

Taper Pipe, Aeronautical High Speed Steel

THREAD FORM
American Standard ANPT, Aeronautical

CHAMFER STYLE
Standard (2 to 3-1/2 threads)

SHANK
Unless otherwise specified, orders for 1/8" pipe taps will be filled with taps having a large shank



SIZE	TYPE	FLUTES	EDP NO.
1/16-27	ANPT	4	14200
1/8-27	ANPT	4	14202
1/8-27*	ANPT	4	14204
1/4-18	ANPT	4	14206
3/8-18	ANPT	4	14208
1/2-14	ANPT	4	14210
3/4-14	ANPT	5	14212
1-11-1/2	ANPT	5	14214
1-1/4-11-1/2	ANPT	5	14216
1-1/2-11-1/2	ANPT	7	14218
2-11-1/2	ANPT	7	14220

*Small Shank

These taps are designed for use where tapping depth is limited. They will still produce L1 + L3 length of full thread. They are suitable for tapping most materials. The chips are retained in the flutes during use. Assembly of PTF threads does not require sealants. Seal is attained by metal-to-metal contact. Nominal tap size is based upon the fitting size, not the actual size of the tap. See Page 36 for tap drill and reaming data. A variety of surface treatments are available to improve performance. See Page 49 for recommendations. See Table 311 on Page 34 for tap dimensions.

LIST 144

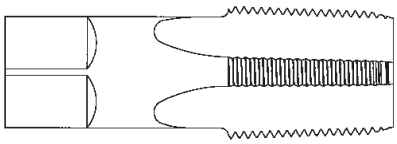
Taper Pipe, Dryseal Short Projection High Speed Steel

SIZE	TYPE	FLUTES	EDP NO.
1/16-27	PTF	4	14400
1/8-27	PTF	4	14402
1/4-18	PTF	4	14406
3/8-18	PTF	4	14408
1/2-14	PTF	4	14410
3/4-14	PTF	5	14412

THREAD FORM
American Standard PTF, Dryseal

CHAMFER STYLE
Standard (1-1/2 to 2 threads)

SHANK
Orders for 1/8" pipe taps will be furnished with large shanks only



These taps will produce threads for low pressure applications and can be assembled with taper pipe threads. These general purpose taps are suitable for tapping most materials. The chips are retained in the flutes during use. Assembly of NPS threads requires a sealant such as Teflon tape or pipe joint compound. Nominal tap size is based upon the fitting size, not the actual size of the tap. A variety of surface treatments are available to improve performance. See Page 49 for recommendations. See Table 311 on Page 34 for tap dimensions.

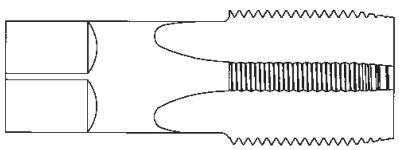
LIST 150

Straight Pipe, Regular High Speed Steel

SIZE	TYPE	FLUTES	EDP NO.
1/8-27	NPS	4	15002
1/4-18	NPS	4	15006
3/8-18	NPS	4	15008
1/2-14	NPS	4	15010
3/4-14	NPS	5	15012
1-11-1/2	NPS	5	15014

THREAD FORM
American Standard NPS, Regular

CHAMFER STYLE
Plug (3 to 5 threads)



HIGH SPEED STEEL / GROUND THREAD

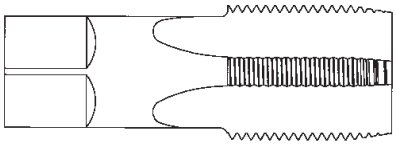
These taps will produce threads for low pressure applications and can be assembled with taper pipe threads. These general purpose taps are suitable for tapping most materials. The chips are retained in the flutes during use. Assembly of NPSF threads does not require sealants. Seal is attained by metal-to-metal contact. Nominal tap size is based upon the fitting size, not the actual size of the tap. A variety of surface treatments are available to improve performance. See Page 49 for recommendations. See Table 311 on Page 34 for tap dimensions.

LIST 152

Straight Pipe, Dryseal High Speed Steel

THREAD FORM
American Standard NPSF, Dryseal

CHAMFER STYLE
Plug (3 to 5 threads)



SIZE	TYPE	FLUTES	EDP NO.
1/8-27	NPSF	4	15202
1/4-18	NPSF	4	15206
3/8-18	NPSF	4	15208
1/2-14	NPSF	4	15210
3/4-14	NPSF	5	15212
1-11-1/2	NPSF	5	15214

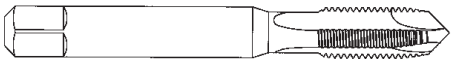
The geometry of these taps is specifically designed for difficult-to-machine materials and they are manufactured from a premium grade of Vanadium High Speed Steel. They are primarily designed for tapping through holes, however, they can also be used in blind holes which are deep enough to allow for chip accumulation in the bottom of the hole. The spiral point forces the chips ahead of the tap, thereby preventing clogging and recutting of chips. Long holes, in excess of 1-1/2 diameters, can be tapped as a result. They can be used by hand or under power and are suitable for tapping most materials. The neck allows for less drag and increased coolant flow into the hole. A variety of surface treatments are available to improve performance. See Page 49 for recommendations. See Table 302 on Page 33 for tap dimensions.

LIST 170

Spiral Pointed, Plug
High Performance
CPM Tungsten Vanadium
High Speed Steel

THREAD FORM
American National

CHAMFER STYLE
Plug (3 to 5 threads)



SIZE	NC NF NS	H-LIMIT	FLUTES	EDP NO. PLUG	EDP NO. BOTTOM
4-40	NC	H2	2	17015	
6-32	NC	H3	2	17024	
8-32	NC	H3	3	17030	
10-24	NC	H3	3	17036	
10-32	NF	H3	3	17040	
1/4-20	NC	H3	3	17048	
1/4-28	NF	H3	3	17054	
5/16-18	NC	H3	3	17060	
5/16-24	NF	H3	3	17066	
3/8-16	NC	H3	3	17071	
3/8-24	NF	H3	3	17075	
7/16-14	NC	H3	4	17078	
7/16-20	NF	H3	4	17081	
1/2-13	NC	H3	4	17085	
1/2-20	NF	H3	4	17089	
5/8-11	NC	H3	4	17093	
5/8-18	NF	H3	4	17095	
3/4-10	NC	H3	4	17096	
3/4-16	NF	H3	4	17098	

PREMIUM STEEL / HIGH PERFORMANCE

The geometry of these taps is specifically designed for difficult-to-machine materials and they are manufactured from a premium grade of Vanadium High Speed Steel. They are primarily designed for tapping blind holes. The spiral flutes draw the chips out of the hole, thereby preventing clogging and recutting of chips. The modified bottoming chamfer allows for threading close to the bottom of the hole while providing additional cutting threads for hard, tough materials. Spiral flutes will also effectively bridge a keyway, or gap inside the hole, without binding. These taps can be used by hand or under power and are suitable for tapping most materials. The neck allows for less drag, additional chip space and increased coolant flow into the hole. A variety of surface treatments are available to improve performance. See Page 49 for recommendations. See Table 302 on Page 33 for tap dimensions.

LIST 172

Spiral Fluted, High Performance, 37° Helix CPM Tungsten Vanadium High Speed Steel

THREAD FORM
American National

CHAMFER STYLE
Modified Bottoming (2 to 3 threads)

SIZE	NC NF NS	H-LIMIT	FLUTES	MODIFIED BOTTOM
4-40	NC	H2	3	17207
6-32	NC	H3	3	17215
8-32	NC	H3	3	17223
10-24	NC	H3	3	17227
10-32	NF	H3	3	17231
1/4-20	NC	H3	3	17239
1/4-28	NF	H3	3	17243
5/16-18	NC	H3	3	17247
5/16-24	NF	H3	3	17251
3/8-16	NC	H3	3	17255
3/8-24	NF	H3	3	17259
7/16-14	NC	H3	4	17263
7/16-20	NF	H3	4	17267
1/2-13	NC	H3	4	17271
1/2-20	NF	H3	4	17275
5/8-11	NC	H3	4	17279
5/8-18	NF	H3	4	17283
3/4-10	NC	H3	4	17287
3/4-16	NF	H3	4	17291

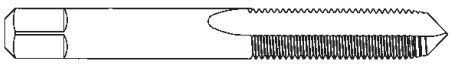
These taps have a high quality, PVD process Titanium Nitride coating which produces a high surface hardness with a low coefficient of friction. This can substantially increase tool life. They can be used by hand or under power, in through or blind holes and are suitable for tapping most materials. The chips are retained in the flutes during use. See Table 302 on Page 33 for tap dimensions.

LIST 190

Machine Screw, Titanium Nitride Coated High Speed Steel

THREAD FORM
American National

CHAMFER STYLE
Plug (3 to 5 threads), Bottoming (1 to 2 threads)
If chamfer style is not specified, plug will be furnished



SIZE	NC NF NS	H-LIMIT	FLUTES	EDP NO. PLUG	EDP NO. BOTTOM
0-80	NF	H1	2	19000	19001
1-64	NC	H1	2	19004	19005
1-72	NF	H1	2	19008	19009
2-56	NC	H2	3	19014	19015
2-64	NF	H2	3	19018	19019
3-48	NC	H2	3	19022	19023
3-56	NF	H2	3	19024	19025
4-40	NC	H2	3	19028	19029
4-48	NF	H2	3	19032	19033
5-40	NC	H2	3	19038	19039
5-44	NF	H2	3	19042	19043
6-32	NC	H3	3	19050	19051
6-40	NF	H2	3	19054	19055
8-32	NC	H3	4	19064	19065
8-36	NF	H2	4	19068	19069
10-24	NC	H3	4	19080	19081
10-32	NF	H3	4	19092	19093
12-24	NC	H3	4	19094	19095
12-28	NF	H3	4	19098	19099

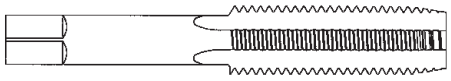
These taps have a high quality, PVD process Titanium Nitride coating which produces a high surface hardness with a low coefficient of friction. This can substantially increase tool life. They can be used by hand or under power, in through or blind holes and are suitable for tapping most materials. The chips are retained in the flutes during use. See Table 302 on Page 33 for tap dimensions.

LIST 192

Hand, Titanium Nitride Coated High Speed Steel

THREAD FORM
American National

CHAMFER STYLE
Plug (3 to 5 threads), Bottoming (1 to 2 threads)
If chamfer style is not specified, plug will be furnished



SIZE	NC NF NS	H-LIMIT	FLUTES	EDP NO. PLUG	EDP NO. BOTTOM
1/4-20	NC	H3	4	19206	19207
1/4-28	NF	H3	4	19212	19213
5/16-18	NC	H3	4	19220	19221
5/16-24	NF	H3	4	19224	19225
3/8-16	NC	H3	4	19232	19233
3/8-24	NF	H3	4	19236	19237
7/16-14	NC	H3	4	19240	19241
7/16-20	NF	H3	4	19244	19245
1/2-13	NC	H3	4	19248	19249
1/2-20	NF	H3	4	19252	19253
9/16-12	NC	H3	4	19254	19255
9/16-18	NF	H3	4	19256	19257
5/8-11	NC	H3	4	19260	19261
5/8-18	NF	H3	4	19262	19263
3/4-10	NC	H3	4	19266	19267
3/4-16	NF	H3	4	19270	19271

TITANIUM NITRIDED

These taps have a high quality, PVD process Titanium Nitride coating which produces a high surface hardness with a low coefficient of friction. This can substantially increase tool life. These taps are primarily designed for tapping through holes, however, they can also be used in blind holes which are deep enough to allow for chip accumulation in the bottom of the hole. The spiral point forces the chips ahead of the tap, thereby preventing clogging and recutting of chips. Long holes, in excess of 1-1/2 diameters, can be tapped as a result. They can be used by hand or under power and are suitable for tapping most materials, especially those with high ductility. See Table 302 on Page 33 for tap dimensions.

LIST 194

Spiral Pointed, Plug, Titanium Nitride Coated High Speed Steel

THREAD FORM
American National

CHAMFER STYLE
Plug (3 to 5 threads)

SIZE	NC NF NS	H-LIMIT	FLUTES	EDP NO. PLUG	EDP NO. BOTTOM
0-80	NF	H2	2	19401	
1-64	NC	H2	2	19403	
1-72	NF	H2	2	19405	
2-56	NC	H2	2	19407	
2-64	NF	H2	2	19409	
3-48	NC	H2	2	19411	
3-56	NF	H2	2	19413	
4-40	NC	H2	2	19415	
4-48	NF	H2	2	19417	
5-40	NC	H2	2	19420	
5-44	NF	H2	2	19421	
6-32	NC	H3	2	19424	
6-40	NF	H2	2	19427	
8-32	NC	H3	2	19430	
8-36	NF	H2	2	19433	
10-24	NC	H3	2	19436	
10-32	NF	H3	2	19440	
12-24	NC	H3	2	19443	
12-28	NF	H3	2	19444	
1/4-20	NC	H3	2	19447	
1/4-28	NF	H3	2	19454	
5/16-18	NC	H3	2	19459	
5/16-24	NF	H3	2	19466	
3/8-16	NC	H3	3	19471	
3/8-24	NF	H3	3	19475	
7/16-14	NC	H3	3	19478	
7/16-20	NF	H3	3	19481	
1/2-13	NC	H3	3	19485	
1/2-20	NF	H3	3	19489	
5/8-11	NC	H3	3	19493	
5/8-18	NF	H3	3	19495	
3/4-10	NC	H3	3	19496	
3/4-16	NF	H3	3	19498	

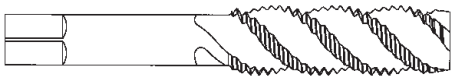
These taps have a high quality, PVD process Titanium Nitride coating which produces a high surface hardness with a low coefficient of friction. This can substantially increase tool life. They are primarily designed for tapping blind holes and preferred for tapping relatively deep ones. The high spiral flutes draw the chips out of the hole at a faster rate, thereby preventing clogging and recutting of chips. Spiral flutes will also effectively bridge a keyway, or slot inside the hole, without binding. These taps can be used by hand or under power and are suitable for tapping most materials, especially mild steel, aluminum, magnesium, copper and brass. See Table 302 on Page 33 for tap dimensions.

LIST 197

Spiral Fluted, Titanium Nitride Coated, 50° Helix High Speed Steel

THREAD FORM
American National

CHAMFER STYLE
Plug (3 to 5 threads), Bottoming (1 to 2 threads)
If chamfer style is not specified, plug will be furnished



SIZE	NC NF NS	H-LIMIT	FLUTES	EDP NO. PLUG	EDP NO. BOTTOM
3-48	NC	H2	2	19702	19703
4-40	NC	H2	2	19706	19707
5-40	NC	H2	2	19710	19711
6-32	NC	H3	2	19714	19715
8-32	NC	H3	3	19722	19723
10-24	NC	H3	3	19726	19727
10-32	NF	H3	3	19730	19731
12-24	NC	H3	3	19734	19735
1/4-20	NC	H3	3	19738	19739
1/4-28	NF	H3	3	19742	19743
5/16-18	NC	H3	3	19746	19747
5/16-24	NF	H3	3	19750	19751
3/8-16	NC	H3	3	19754	19755
3/8-24	NF	H3	3	19758	19759
7/16-14	NC	H3	3	19762	19763
7/16-20	NF	H3	3	19766	19767
1/2-13	NC	H3	3	19770	19771
1/2-20	NF	H3	3	19774	19775

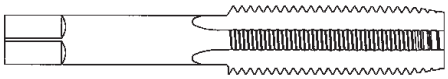
These general purpose taps can be used by hand or under power, in through or blind holes and are suitable for tapping most materials. The chips are retained in the flutes during use. A variety of surface treatments are available to improve performance. See Page 49 for recommendations. Metric tap general dimensions are equivalent to inch taps. See Table 302 on Page 33 for dimensions.

LIST 230

Hand, Metric High Speed Steel

THREAD FORM
M-Profile

CHAMFER STYLE
Taper (7 to 10 threads), Plug (3 to 5 threads), Bottoming (1 to 2 threads)
If chamfer style is not specified, plug will be furnished



SIZE	PITCH	D-LIMIT	FLUTES	EDP NO. TAPER	EDP NO. PLUG	EDP NO. BOTTOM
M1.6	0.35	D3	2		23002	
M2	0.4	D3	3	23007	23008	23009
M2.5	0.45	D3	3		23014	
M3	0.5	D3	3	23016	23017	23018
M3.5	0.6	D4	3		23020	
M4	0.7	D4	4	23022	23023	23024
M4.5	0.75	D4	4		23026	
M5	0.8	D4	4	23028	23029	23030
M6	1	D5	4	23031	23032	23033
M7	1	D5	4	23037	23038	23039
M8	1.25	D5	4	23043	23044	23045
M10	1.25	D5	4	23046	23047	23048
M10	1.5	D6	4	23049	23050	23051
M12	1.25	D5	4	23052	23053	23054
M12	1.75	D6	4	23055	23056	23057
M14	1.5	D6	4	23058	23059	23060
M14	2	D7	4	23061	23062	23063
M16	1.5	D6	4	23064	23065	23066
M16	2	D7	4	23067	23068	23069
M18	1.5	D6	4	23070	23071	23072
M18	2.5	D7	4	23073	23074	23075
M20	2.5	D7	4	23076	23077	23078
M24	3	D8	4	23082	23083	23084
M27	3	D8	4	23085	23086	23087
M30	3.5	D9	4	23088	23089	23090
M33	3.5	D9	4	23091	23092	23093
M36	4	D9	4	23094	23095	23096

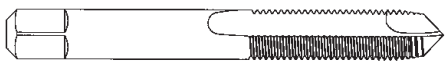
These taps are primarily designed for tapping through holes, however, they can also be used in blind holes which are deep enough to allow for chip accumulation in the bottom of the hole. The spiral point forces the chips ahead of the tap, thereby preventing clogging and recutting of chips. Long holes, in excess of 1-1/2 diameters, can be tapped as a result. They can be used by hand or under power and are suitable for tapping most materials, especially those with high ductility. A variety of surface treatments are available to improve performance. See Page 49 for recommendations. Metric tap general dimensions are equivalent to inch taps. See Table 302 on Page 33 for dimensions.

LIST 232

Spiral Pointed, Metric High Speed Steel

THREAD FORM
M-Profile

CHAMFER STYLE
Plug (3 to 5 threads)



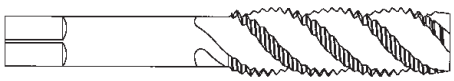
SIZE	PITCH	D-LIMIT	FLUTES	EDP NO. PLUG	EDP NO. BOTTOM
M1.6	0.35	D3	2	23202	
M2	0.4	D3	2	23208	
M2.5	0.45	D3	2	23214	
M3	0.5	D3	2	23217	
M3.5	0.6	D4	2	23220	
M4	0.7	D4	2	23223	
M4.5	0.75	D4	2	23226	
M5	0.8	D4	2	23229	
M6	1	D5	2	23232	
M7	1	D5	2	23238	
M8	1.25	D5	2	23244	
M10	1.5	D6	3	23250	
M12	1.75	D6	3	23256	
M14	2	D7	3	23262	
M16	2	D7	3	23268	
M18	2.5	D7	3	23274	
M20	2.5	D7	4	23277	

These taps are primarily designed for tapping blind holes and preferred for tapping relatively deep ones. The high spiral flutes draw the chips out of the hole at a faster rate, thereby preventing clogging and recutting of chips. Spiral flutes will also effectively bridge a keyway, or slot inside the hole, without binding. These taps can be used by hand or under power and are suitable for tapping most materials, especially mild steel, aluminum, magnesium, copper and brass. A variety of surface treatments are available to improve performance. See Page 49 for recommendations. Metric tap general dimensions are equivalent to inch taps. See Table 302 on Page 33 for dimensions.

LIST 234 Spiral Fluted, Metric, 50° Helix High Speed Steel

THREAD FORM
M-Profile

CHAMFER STYLE
Plug (3 to 5 threads), Bottoming (1 to 2 threads)
If chamfer style is not specified, plug will be furnished



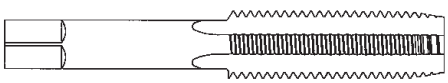
SIZE	PITCH	D-LIMIT	FLUTES	EDP NO. PLUG	EDP NO. BOTTOM
M3	0.5	D3	2	23417	23418
M3.5	0.6	D4	3	23420	23421
M4	0.7	D4	3	23423	23424
M4.5	0.75	D4	3	23426	23427
M5	0.8	D4	3	23429	23430
M6	1	D5	3	23432	23433
M8	1.25	D5	3	23444	23445
M10	1.5	D6	3	23450	23451
M12	1.75	D6	3	23456	23457

These taps can be used by hand or under power to produce or repair threads for spark plugs. A variety of surface treatments are available to improve performance. See Page 49 for recommendations. Metric tap general dimensions are equivalent to inch taps. See Table 302 on Page 33 for dimensions.

LIST 236 Hand, Spark Plug, Metric High Speed Steel

THREAD FORM
M-Profile

CHAMFER STYLE
Plug (3 to 5 threads), Bottoming (1 to 2 threads)
If chamfer style is not specified, plug will be furnished



SIZE	PITCH	D-LIMIT	FLUTES	EDP NO. PLUG	EDP NO. BOTTOM
M14	1.25	D7	4	23662	23663
M18	1.5	D7	4	23674	23675

Adjustable Round Split High Speed Steel

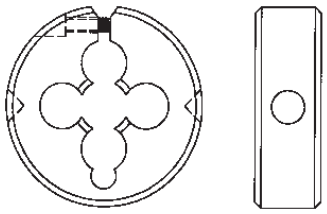
FRACTIONAL AND MACHINE SCREW SIZES

SIZE	NC NF NS	EDP NO. 13/16" OD	1" OD	1-1/2" OD	2" OD
5-40	NC	40110			
5-44	NF	40111			
6-32	NC	40112	40113		
6-40	NF	40114			
8-32	NC	40115	40116		
8-36	NF	40117			
10-24	NC	40118	40119		
10-32	NF	40120	40121		
12-24	NC	40122	40123		
12-28	NF	40124			
1/4-20	NC	40127	40128	40129	
1/4-28	NF	40130	40131	40132	
5/16-18	NC	40135	40136	40137	
5/16-24	NF	40138	40139	40140	
3/8-16	NC		40143	40144	
3/8-24	NF		40146	40147	
7/16-14	NC		40149	40150	
7/16-20	NF		40152	40153	
1/2-13	NC			40155	
1/2-20	NF			40156	
9/16-12	NC			40159	
9/16-18	NF			40161	
5/8-11	NC			40163	40164
5/8-18	NF			40166	40167
3/4-10	NC				40171
3/4-16	NF				40173
7/8-9	NC				40175
7/8-14	NF				40177

THREAD FORM

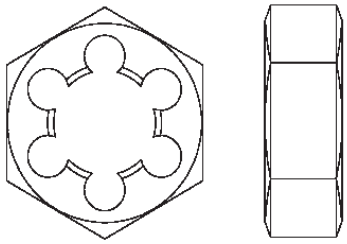
American National

OUTSIDE DIAMETER	THICKNESS
13/16"	1/4"
1"	3/8"
1-1/2"	1/2"
2"	5/8"



LIST 305 Hexagon Rethreading Carbon Steel

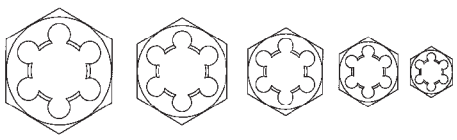
THREAD FORM
American National



SIZE	NC NF NS	DIMENSIONS		EDP NO.
		ACROSS FLATS	THICKNESS	
1/4-20	NC	19/32	1/4	30529
1/4-28	NF	19/32	1/4	30532
5/16-18	NC	11/16	5/16	30537
5/16-24	NF	11/16	5/16	30540
3/8-16	NC	25/32	3/8	30544
3/8-24	NF	25/32	3/8	30547
7/16-14	NC	7/8	7/16	30550
7/16-20	NF	7/8	7/16	30553
1/2-13	NC	1-1/16	1/2	30555
1/2-20	NF	1-1/16	1/2	30557
9/16-12	NC	1-1/16	1/2	30559
9/16-18	NF	1-1/16	1/2	30561
5/8-11	NC	1-1/4	5/8	30563
5/8-18	NF	1-1/4	5/8	30566
11/16-11	NS	1-7/16	3/4	30568
11/16-16	N	1-7/16	3/4	30569
3/4-10	NC	1-7/16	3/4	30571
3/4-16	NF	1-7/16	3/4	30573
7/8-9	NC	1-5/8	7/8	30575
7/8-14	NF	1-5/8	7/8	30577
1-8	NC	1-13/16	1	30579
1-12	NF	1-13/16	1	30581
1-14	NS	1-13/16	1	30583
1-1/8-7	NC	2	1	30584
1-1/8-12	NF	2	1	30585
1-1/4-7	NC	2-3/16	1	30586
1-1/4-12	NF	2-3/16	1	30587
1-3/8-6	NC	2-3/8	1	30588
1-3/8-12	NF	2-3/8	1	30589
1-1/2-6	NC	2-9/16	1	30590
1-1/2-12	NF	2-9/16	1	30591

These sets consist of an assortment of Hexagon Rethreading Dies in American National form of thread. These dies are neatly packed in a wooden case.

LIST 306 Hexagon Rethreading in Sets Carbon Steel



SET NUMBER	RANGE OF CUTTING SIZES INCHES		NO. CUTTING SIZES
	SINGLE SETS NC	COMBINATION SETS NC & NF	
30600	1/4 to 3/4	–	8
30610	1/4 to 1	–	10
30620	1/4 to 1-1/2	–	14
30630	–	1/4-1/2	10
30640	–	1/4-3/4	16
30650	–	1/4-1	20

TABLE 302

Standard Hand Tap
Dimensions, Screw, Fractional and Metric Sizes

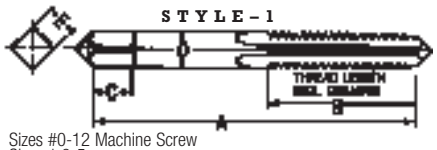
GENERAL DIMENSIONS

NOMINAL DIA. RANGE–IN. OVER	NOMINAL DIA. RANGE–IN. TO (INCL.)	MACHINE SCREW SIZE NO.	NOMINAL FRACTIONAL DIAMETER (IN.)	METRIC DIAMETER (MM)	STYLE	OVERALL LENGTH A	THREAD LENGTH B	SQUARE LENGTH C	SHANK DIA. D	SIZE OF SQUARE E
.052	.065	0	1/16	M1.6	1	1-5/8	5/16	3/16	.141	.110
.065	.078	1		M1.8	1	1-11/16	3/8	3/16	.141	.110
.078	.091	2		M2, M2.2	1	1-3/4	7/16	3/16	.141	.110
.091	.104	3	3/32	M2.5	1	1-13/16	1/2	3/16	.141	.110
.104	.117	4			1	1-7/8	9/16	3/16	.141	.110
.117	.130	5	1/8	M3, M3.15	1	1-15/16	5/8	3/16	.141	.110
.130	.145	6		M3.5	1	2	11/16	3/16	.141	.110
.145	.171	8	5/32	M4	1	2-1/8	3/4	1/4	.168	.131
.171	.197	10	3/16	M4.5, M5	1	2-3/8	7/8	1/4	.194	.152
.197	.223	12	7/32		1	2-3/8	15/16	9/32	.220	.165
.223	.260	14	1/4	M6, M6.3	2	2-1/2	1	5/16	.255	.191
.260	.323		5/16	M7, M8	2	2-23/32	1-1/8	3/8	.318	.238
.323	.395		3/8	M10	2	2-15/16	1-1/4	7/16	.381	.286
.395	.448		7/16		3	3-5/32	1-7/16	13/32	.323	.242
.448	.510		1/2	M12, M12.5	3	3-3/8	1-21/32	7/16	.367	.275
.510	.573		9/16	M14	3	3-19/32	1-21/32	1/2	.429	.322
.573	.635		5/8	M16	3	3-13/16	1-13/16	9/16	.480	.360
.635	.709		11/16	M18	3	4-1/32	1-13/16	5/8	.542	.406
.709	.760		3/4		3	4-1/4	2	11/16	.590	.442
.760	.823		13/16	M20	3	4-15/32	2	11/16	.652	.489
.823	.885		7/8	M22	3	4-11/16	2-7/32	3/4	.697	.523
.885	.948		15/16	M24	3	4-29/32	2-7/32	3/4	.760	.570
.948	1.010		1	M25	3	5-1/8	2-1/2	13/16	.800	.600
1.010	1.073		1-1/16	M27	3	5-1/8	2-1/2	7/8	.896	.672
1.073	1.135		1-1/8		3	5-7/16	2-9/16	7/8	.896	.672
1.135	1.198		1-3/16	M30	3	5-7/16	2-9/16	1	1.021	.766
1.198	1.260		1-1/4		3	5-3/4	2-9/16	1	1.021	.766
1.260	1.323		1-5/16	M33	3	5-3/4	2-9/16	1-1/16	1.108	.831
1.323	1.385		1-3/8		3	6-1/16	3	1-1/16	1.108	.831
1.385	1.448		1-7/16	M36	3	6-1/16	3	1-1/8	1.233	.925
1.448	1.510		1-1/2		3	6-3/8	3	1-1/8	1.233	.925

TOLERANCES

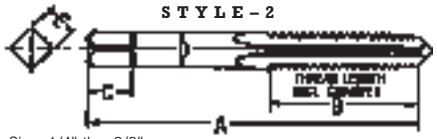
ELEMENT	NOMINAL DIAMETER RANGE–INCHES OVER	NOMINAL DIAMETER RANGE–INCHES TO (INCL.)	DIRECTION	TOLERANCE–INCHES GROUND THREAD
Length Overall–A	.052	1.010	Plus or Minus	1/32
	1.010	1.510	Plus or Minus	1/16
Length of Thread–B	.052	.223	Plus or Minus	3/64
	.223	.510	Plus or Minus	1/16
	.510	1.510	Plus or Minus	3/32
Length of Square–C	.052	1.010	Plus or Minus	1/32
	1.010	1.510	Plus or Minus	1/16
Diameter of Shank–D	.052	.223	Minus	.0015
	.223	.635	Minus	.0015
	.635	1.010	Minus	.002
	1.010	1.510	Minus	.002
Size of Square–E	.052	.510	Minus	.004
	.510	1.010	Minus	.006
	1.010	1.510	Minus	.008

STYLE – 1



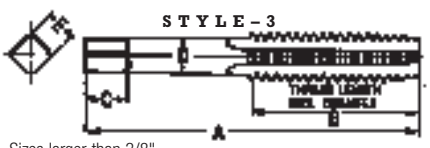
Sizes #0-12 Machine Screw
Sizes 1.6-5mm

STYLE – 2



Sizes 1/4" thru 3/8"
Sizes 6-10mm

STYLE – 3



Sizes larger than 3/8"
Sizes 12mm and larger

TABLE 311

Standard Pipe Tap Dimensions, Straight and Taper, Ground Thread

GENERAL DIMENSIONS

NOMINAL SIZES INCHES	OVERALL LENGTH A	LENGTH OF THREAD B	LENGTH OF SQUARE C	DIAMETER OF SHANK D	SIZE OF SQUARE E
1/16	2-1/8	11/16	3/8	.3125	.234
1/8*	2-1/8	3/4	3/8	.3125	.234
1/8	2-1/8	3/4	3/8	.4375	.328
1/4	2-7/16	1-1/16	7/16	.5625	.421
3/8	2-9/16	1-1/16	1/2	.7000	.531
1/2	3-1/8	1-3/8	5/8	.6875	.515
3/4	3-1/4	1-3/8	11/16	.9063	.679
1	3-3/4	1-3/4	13/16	1.1250	.843
1-1/4	4	1-3/4	15/16	1.3125	.984
1-1/2	4-1/4	1-3/4	1	1.5000	1.125
2	4-1/2	1-3/4	1-1/8	1.8750	1.406
2-1/2	5-1/2	2-9/16	1-1/4	2.2500	1.687
3	6	2-5/8	1-3/8	2.6250	1.968
3-1/2	6-1/2	2-11/16	1-1/2	2.8125	2.108
4	6-3/4	2-3/4	1-5/8	3.0000	2.250

*Small Shank

TOLERANCES

ELEMENT	RANGE	DIRECTION	TOLERANCE
Length Overall–A	1/16" to 3/4" incl.	Plus or Minus	1/32"
	1" to 4" incl.	Plus or Minus	1/16"
Length of Thread–B	1/16" to 3/4" incl.	Plus or Minus	1/16"
	1" to 1-1/4" incl.	Plus or Minus	3/32"
	1-1/2" to 4" incl.	Plus or Minus	1/8"
Length of Square–C	1/16" to 3/4" incl.	Plus or Minus	1/32"
	1" to 4" incl.	Plus or Minus	1/16"
Dia. of Shank–D	1/16" to 1/8" incl.	Minus	.0015"
	1/4" to 1/2" incl.	Minus	.0020"
	3/4" to 1" incl.	Minus	.0020"
	1-1/4" to 4" incl.	Minus	.0030"
Size of Square–E	1/16" to 1/8" incl.	Minus	.0040"
	1/4" to 3/4" incl.	Minus	.0060"
	1" to 4" incl.	Minus	.0080"

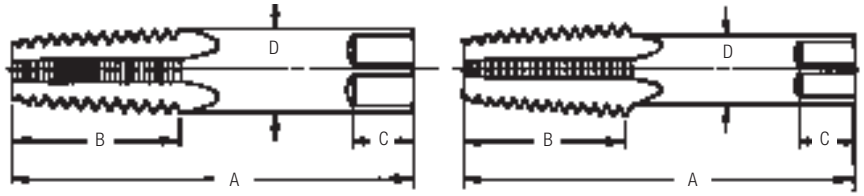


TABLE 357

American National Standard and Dryseal American National Standard Taper Pipe Threads

BASIC DIMENSIONS–TAPER THREAD

Nominal Pipe Size Inches	Outside Dia. of Pipe Inches	Threads per Inch	Pitch of Thread	Pitch Dia. at Gaging Notch Basic Inches	Thickness of Standard Thin Ring Gage and Distance from Small End to Gaging Notch–Inches	Effective Thread External Inches	Wrench Make Up Inches	Total Length of Thread Inches	Pitch Dia. at Small End of Internal Effective Thread Inches	Pitch Dia. at End of Pipe Inches	Minor Diameter at End of Pipe Inches	*Tap Drill Size	Minimum Hole Depth for Std. Pipe Tap Table 338
	D	n	p	E_1	L_1	L_2	L_3	L_4	E_3	E_0	K_0	NPT & NPTF	
1/16	.3125	27	.03704	.28118	.160	.2611	.1111	.3896	.26424	.27118	.2416	C	9/16
1/8	.405	27	.03704	.37360	.1615	.2639	.1111	.3924	.35656	.36351	.3339	Q	19/32
1/4	.540	18	.05556	.49163	.2278	.4018	.1667	.5946	.46697	.47739	.4329	7/16	13/16
3/8	.675	18	.05556	.62701	.240	.4078	.1667	.6006	.60160	.61201	.5676	9/16	13/16
1/2	.840	14	.07143	.77843	.320	.5337	.2143	.7815	.74504	.75843	.7013	45/64	1-1/32
3/4	1.050	14	.07143	.98887	.339	.5457	.2143	.7935	.95429	.96768	.9105	29/32	1-1/32
1	1.315	11-1/2	.08696	1.23863	.400	.6828	.2609	.9845	1.19733	1.21363	1.1441	1-9/64	1-1/4
1-1/4	1.660	11-1/2	.08696	1.58338	.420	.7068	.2609	1.0085	1.54083	1.55713	1.4876	1-31/64	1-9/32
1-1/2	1.900	11-1/2	.08696	1.82234	.420	.7235	.2609	1.0252	1.77978	1.79609	1.7265	1-23/32	1-5/16
2	2.375	11-1/2	.08696	2.29627	.436	.7565	.2609	1.0582	2.25272	2.26902	2.1995	2-3/16	1-9/32
2-1/2	2.875	8	.12500	2.76216	.682	1.1375	.250[1]	1.5712	2.70391[1]	2.71953	2.6195	2-39/64	1-27/32
3	3.500	8	.12500	3.38850	.766	1.2000	.250[2]	1.6337	3.32500[2]	3.34062	3.2406	3-15/64	1-29/32
3-1/2	4.000	8	.12500	3.88881	.821	1.2500	.250	1.6837	3.82188	3.83750	3.7375		2
4	4.500	8	.12500	4.38712	.844	1.3000	.250	1.7337	4.31875	4.33438	4.2344		2-1/16
5	5.563	8	.12500	5.44929	.937	1.4063	.250	1.8400	5.37511	5.39073	5.2907		
6	6.625	8	.12500	6.50597	.958	1.5125	.250	1.9462	6.43047	6.44609	6.3461		
8	8.625	8	.12500	8.50003	1.063	1.7125	.250	2.1462	8.41797	8.43359	8.3336		
10	10.750	8	.12500	10.62094	1.210	1.9250	.250	2.3587	10.52969	10.54531	10.4453		
12	12.750	8	.12500	12.61781	1.360	2.1250	.250	2.5587	12.51719	12.53281	12.3428		

[1]2-1/2" NPTF and ANPT L_3=.375, E_3=2.69609 [2]3" NPTF and ANPT L_3=.375, E3-3.31719

*Methods of inspection vary. Care should be taken to use a tap drill or taper reamer which can meet thread specifications. Sizes given permit direct tapping without reaming the hole, but only give a full thread for approx. L_1 distance. See columns K_0 and L_3.

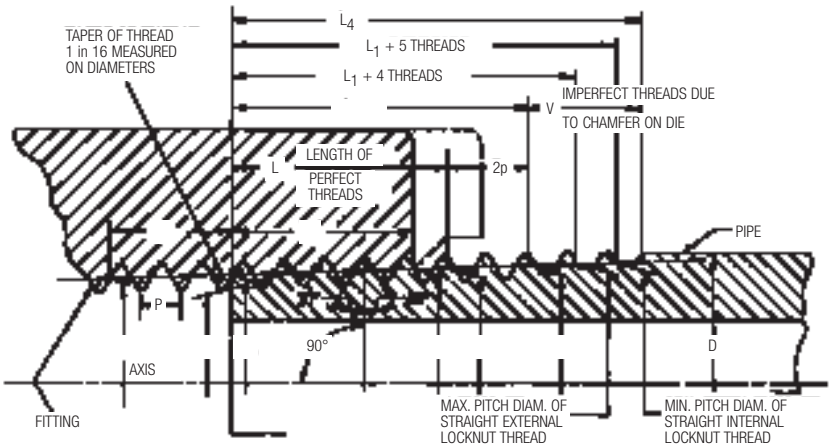
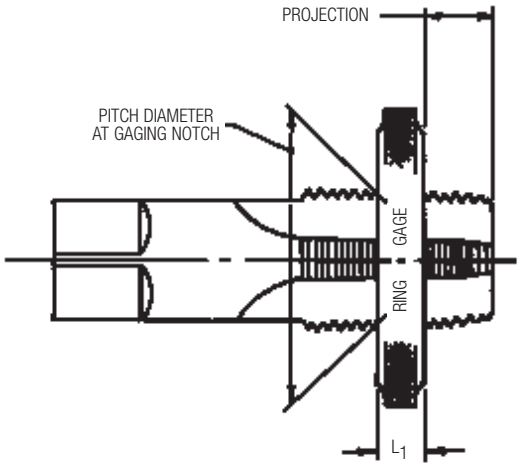


TABLE 357

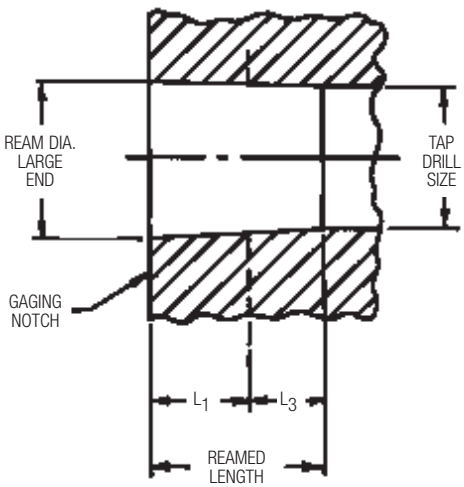
Measurement of Taper Pipe Taps, Reaming Data and Tap Drill Sizes

SIZE	PROTECTION: NPT & NPTF MIN.	PROTECTION: NPT & NPTF MAX.	PROTECTION: SAE-SHORT MIN.	PROTECTION: SAE-SHORT MAX.	REAM DIA. LARGE END	GAGE WIDTH L_1	REAMED LENGTH $L_1 + L_3$	TAP DRILL FOR USE WITH REAMING	TAP DRILL FOR USE WITHOUT REAMING	FORMING TAP DRILL FOR USE WITHOUT REAMING
1/16-27	.250	.375	.222	.259	.2515	.1600	.2711	15/64	C	I
1/8-27	.250	.375	.222	.259	.3340	.1615	.2726	21/64	Q	9.25mm
1/4-18	.397	.521	.333	.389	.4472	.2278	.3945	27/64	7/16	12.1mm
3/8-18	.392	.516	.333	.389	.5826	.240	.4067	9/16	9/16	5/8
1/2-14	.517	.641	.429	.500	.7213	.320	.5343	11/16	45/64	19.3mm
3/4-14	.503	.627	.429	.500	.9317	.339	.5533	57/64	29/32	31/32
1-11-1/2	.584	.772			1.1691	.400	.6609	1-1/8	1-9/64	
1-1/4-11-1/2	.592	.780			1.5138	.420	.6809	1-15/32	1-31/64	
1-1/2-11-1/2	.606	.792			1.7528	.420	.6809	1-45/64	1-23/32	
2-11-1/2	.574	.760			2.2267	.436	.6969	2-3/16	2-3/16	

PROJECTION THRU RING GAGE



REAMED HOLE DATA



Tap Recommendations for Classes 2, 3, 2B & 3B
Unified and American Screw Threads

SCREW SIZES

SIZE	THREADS PER INCH		RECOMMENDED TAP FOR CLASS OF THREAD				MIN. ALL CLASSES (BASIC)	PITCH DIAMETER LIMITS FOR CLASS OF THREAD			
	NC AND UNC	NF AND UNF	CLASS 2	CLASS 3	CLASS 2B	CLASS 3B		MAX. CLASS 2	MAX. CLASS 3	MAX. CLASS 2B	MAX. CLASS 3B
0	**	80	G H1	G H1	G H2	G H1	.0519	.0536	.0532	.0542	.0536
1	64	**	G H1	G H1	G H2	G H1	.0629	.0648	.0643	.0655	.0648
1	**	72	G H1	G H1	G H2	G H1	.0640	.0658	.0653	.0665	.0659
2	56	**	G H1	G H1	G H2	G H1	.0744	.0764	.0759	.0772	.0765
2	**	64	G H1	G H1	G H2	G H1	.0759	.0778	.0773	.0786	.0779
3	48	**	G H1	G H1	G H2	G H1	.0855	.0877	.0871	.0885	.0877
3	**	56	G H1	G H1	G H2	G H1	.0874	.0894	.0889	.0902	.0895
4	40	**	G H2	G H1	G H2	G H2	.0958	.0982	.0975	.0991	.0982
4	**	48	G H1	G H1	G H2	G H1	.0985	.1007	.1001	.1016	.1008
5	40	**	G H2	G H1	G H2	G H2	.1088	.1112	.1105	.1121	.1113
5	**	44	G H1	G H1	G H2	G H1	.1102	.1125	.1118	.1134	.1126
6	32	**	G H2	G H1	G H3	G H2	.1177	.1204	.1196	.1214	.1204
6	**	40	G H2	G H1	G H2	G H2	.1218	.1242	.1235	.1252	.1243
8	32	**	G H2	G H1	G H3	G H2	.1437	.1464	.1456	.1475	.1465
8	**	36	G H2	G H1	G H2	G H2	.1460	.1485	.1478	.1496	.1487
10	24	**	G H3	G H1	G H3	G H3	.1629	.1662	.1653	.1672	.1661
10	**	32	G H2	G H1	G H3	G H2	.1697	.1724	.1716	.1736	.1726
12	24	**	G H3	G H1	G H3	G H3	.1889	.1922	.1913	.1933	.1922
12	**	28	G H3	G H1	G H3	G H3	.1928	.1959	.1950	.1970	.1959

The above recommended taps normally produce the Class of Thread indicated in average materials when used with reasonable care. However, if the tap specified dies not give a satisfactory gage fit in the work, a choice of some other limit tap will be necessary.

Tap Recommendations for Classes 2, 3, 2B & 3B Unified and American Screw Threads

FRACTIONAL SIZES

	THREADS PER INCH		RECOMMENDED TAP FOR CLASS OF THREAD					PITCH DIAMETER LIMITS FOR CLASS OF THREAD			
SIZE	NC AND UNC	NF AND UNF	CLASS 2	CLASS 3	CLASS †2B	CLASS 3B	MIN. ALL CLASSES (BASIC)	MAX. CLASS 2	MAX. CLASS 3	MAX. CLASS 2B	MAX. CLASS 3B
1/4	20	**	G H3	G H2	G H5	G H3	.2175	.2211	.2201	.2223	.2211
1/4	**	28	G H3	G H1	G H4	G H3	.2268	.2299	.2290	.2311	.2300
5/16	18	**	G H3	G H2	G H5	G H3	.2764	.2805	.2794	.2817	.2803
5/16	**	24	G H3	G H1	G H4	G H3	.2854	.2887	.2878	.2902	.2890
3/8	16	**	G H3	G H2	G H5	G H3	.3344	.3389	.3376	.3401	.3387
3/8	**	24	G H3	G H1	G H4	G H3	.3479	.3512	.3503	.3528	.3516
7/16	14	**	G H5	G H3	G H5	G H3	.3911	.3960	.3947	.3972	.3957
7/16	**	20	G H3	G H1	G H5	G H3	.4050	.4086	.4076	.4104	.4091
1/2	13	**	G H5	G H3	G H5	G H3	.4500	.4552	.4537	.4565	.4548
1/2	**	20	G H3	G H1	G H5	G H3	.4675	.4711	.4701	.4731	.4717
9/16	12	**	G H5	G H3	G H5	G H3	.5084	.5140	.5124	.5152	.5135
9/16	**	18	G H3	G H2	G H5	G H3	.5264	.5305	.5294	.5323	.5308
5/8	11	**	G H5	G H3	G H5	G H3	.5660	.5719	.5702	.5732	.5714
5/8	**	18	G H3	G H2	G H5	G H3	.5889	.5930	.5919	.5949	.5934
3/4	10	**	G H5	G H3	G H5	G H5	.6850	.6914	.6895	.6927	.6907
3/4	**	16	G H3	G H2	G H5	G H3	.7094	.7139	.7126	.7159	.7143
7/8	9	**	G H6	G H4	G H6	G H4	.8028	.8098	.8077	.8110	.8089
7/8	**	14	G H4	G H2	G H6	G H4	.8286	.8335	.8322	.8356	.8339
1	8	**	G H6	G H4	G H6	G H4	.9188	.9264	.9242	.9276	.9254
1	**	12	G H4	G H2	G H6	G H4	.9459	.9515	.9499	.9535	.9516
1		14 NS	G H4	G H2	G H6	G H4	.9536	.9585	.9572	.9609	.9590
1-1/8	7	**	G H8	G H4	G H8	G H4	1.0322	1.0407	1.0381	1.0416	1.0393
1-1/8	**	12	G H4	G H4	G H6	G H4	1.0709	1.0765	1.0749	1.0787	1.0768
1-1/4	7	**	G H8	G H4	G H8	G H4	1.1572	1.1657	1.1631	1.1668	1.1644
1-1/4	**	12	G H4	G H4	G H6	G H4	1.1959	1.2015	1.1999	1.2039	1.2019
1-3/8	6	**	G H8	G H4	G H8	G H4	1.2667	1.2768	1.2738	1.2771	1.2745
1-3/8	**	12	G H4	G H4	G H6	G H4	1.3209	1.3265	1.3249	1.3291	1.3270
1-1/2	6	**	G H8	G H4	G H8	G H4	1.3917	1.4018	1.3988	1.4022	1.3996
1-1/2	**	12	G H4	G H4	G H6	G H4	1.4459	1.4515	1.4499	1.4542	1.4522

The above recommended taps normally produce the Class of Thread indicated in average materials when used with reasonable care. However, if the tap specified does not give a satisfactory gage fit in the work, a choice of some other limit tap will be necessary.

Forming Tap Recommendations for Classes 2, 2B & 3B
Unified and American Screw Threads

SCREW SIZES	THREADS PER INCH: NC AND UNC	THREADS PER INCH: NF AND UNF	RECOMMENDED LIMIT: CLASS 2	RECOMMENDED LIMIT: CLASS 2B	RECOMMENDED LIMIT: CLASS 3B
0		80	G H2	G H3	G H2
1	64		G H2	G H3	G H2
		72	G H2	G H3	G H2
2	56		G H2	G H3	G H2
		64	G H2	G H3	G H2
3	48		G H2	G H3	G H2
		56	G H2	G H3	G H2
4	40		G H3	G H5	G H3
		48	G H3	G H5	G H3
5	40		G H3	G H5	G H3
		44	G H3	G H5	G H3
6	32		G H3	G H5	G H3
		40	G H3	G H5	G H3
8	32		G H3	G H5	G H3
		36	G H3	G H5	G H3
10	24		G H4	G H6	G H4
		32	G H4	G H6	G H4
12	24		G H4	G H6	G H4
		28	G H4	G H6	G H4
FRACTIONAL SIZES					
1/4	20		G H4	G H6	G H4
		28	G H4	G H6	G H4
5/16	18		G H5	G H7	G H5
		24	G H5	G H7	G H5
3/8	16		G H5	G H7	G H5
		24	G H5	G H7	G H5
7/16	14		G H5	G H8	G H5
		20	G H5	G H8	G H5
1/2	13		G H5	G H8	G H5
		20	G H5	G H8	G H5
9/16	12		G H7	G H10	G H7
		18	G H7	G H10	G H7
5/8	11		G H7	G H10	G H7
		18	G H7	G H10	G H7
3/4	10		G H7	G H10	G H7
		16	G H7	G H10	G H7
7/8	9		G H9	G H12	G H9
		14	G H9	G H12	G H9
1	8		G H9	G H12	G H9
		12	G H9	G H12	G H9

The above recommended taps normally produce the Class of Thread indicated in average materials when used with reasonable care. However, if the tap specified does not give a satisfactory gage fit in the work, a choice of some other limit tap will be necessary. All the H-Limits shown will produce a Class 2B fit.

Tap Recommendations for Classes 4H & 6H Metric Screw Threads

THREAD PER INCH		RECOMMENDED TAP FOR CLASS OF THREAD		PITCH DIAMETER LIMITS FOR CLASS OF THREAD					
				MILLIMETERS			INCH CONVERSION		
NOMINAL DIAMETER	PITCH	4H	6H	MIN. ALL CLASSES (BASIC)	MAX. 4H	MAX. 6H	MIN. ALL CLASSES (BASIC)	MAX. 4H	MAX. 6H
M1.6	0.35	D1	D3	1.373	1.426	1.458	.0541	.0561	.0574
M2	0.4	D1	D3	1.740	1.796	1.830	.0685	.0707	.0720
M2.5	0.45	D1	D3	2.208	2.268	2.303	.0869	.0893	.0907
M3	0.5	D1	D3	2.675	2.738	2.775	.1053	.1078	.1092
M3.5	0.6	D1	D4	3.110	3.181	3.222	.1224	.1252	.1268
M4	0.7	D2	D4	3.545	3.620	3.663	.1396	.1425	.1442
M4.5	0.75	D2	D4	4.013	4.088	4.131	.1580	.1609	.1626
M5	0.8	D2	D4	4.480	4.560	4.605	.1764	.1795	.1813
M6	1	D3	D5	5.350	5.445	5.500	.2106	.2144	.2165
M6	0.75	D2	D3	5.513	5.598	5.645	.2170	.2204	.2222
M7	1	D3	D5	6.350	6.445	6.500	.2500	.2537	.2559
M7	0.75	D2	D4	6.513	6.598	6.645	.2564	.2598	.2616
M8	1.25	D3	D5	7.188	7.288	7.348	.2830	.2869	.2893
M8	1	D3	D5	7.350	7.445	7.500	.2894	.2931	.2953
M10	1.5	D3	D6	9.026	9.138	9.206	.3554	.3598	.3624
M10	1.25	D3	D5	9.188	9.288	9.348	.3617	.3657	.3680
M12	1.75	D3	D6	10.863	10.988	11.063	.4277	.4326	.4356
M12	1.25	D3	D5	11.188	11.300	11.368	.4405	.4449	.4476
M14	2	D3	D7	12.701	12.833	12.913	.5000	.5052	.5084
M14	1.5	D3	D6	13.026	13.144	13.216	.5128	.5175	.5203
M16	2	D4	D7	14.701	14.833	14.913	.5788	.5840	.5871
M16	1.5	D3	D6	15.026	15.144	15.216	.5916	.5962	.5990
M18	2.5	D4	D7	16.376	16.516	16.600	.6447	.6502	.6535
M18	1.5	D3	D6	17.026	17.144	17.216	.6703	.6750	.6778
M20	2.5	D4	D7	18.376	18.516	18.600	.7235	.7290	.7323
M20	1.5	D3	D5	19.026	19.144	19.216	.7490	.7537	.7565
M24	3	D4	D8	22.051	22.221	22.316	.8681	.8748	.8786
M24	1.5	D3	D5	23.026	23.151	23.226	.9065	.9114	.9144
M27	3	D5	D8	25.051	25.221	25.316	.9863	.9930	.9967
M27	2	D5	D7	25.701	25.841	25.925	1.0118	1.0174	1.0207
M30	3.5	D5	D9	27.727	27.907	28.007	1.0916	1.0987	1.1026
M30	2	D5	D7	28.701	28.841	28.925	1.1300	1.1355	1.1388
M33	3.5	D5	D9	30.727	30.907	31.007	1.2097	1.2168	1.2207
M33	2	D5	D7	31.701	31.841	31.925	1.2481	1.2536	1.2569
M36	4	D5	D9	33.402	33.592	33.702	1.3150	1.3225	1.3268
M36	2	D5	D7	34.701	34.841	34.925	1.3662	1.3717	1.3750

The above recommended taps normally produce the Class of Thread indicated in average materials when used with reasonable care. However, if the tap specified does not give a satisfactory gage fit in the work, a choice of some other limit tap will be necessary.
D1 Limit to have minus .0005 tolerance.

TABLE 329

Standard Machine Screw Taps for Tapping Unified and American National Coarse and Fine Threads

	THREADS PER INCH			MAJOR DIAMETER						PITCH DIAMETER LIMITS							
				GROUND THREAD			CUT THREAD			GROUND THREAD							
										H1 LIMIT		H2 LIMIT		H3 LIMIT		CUT THD.	
SIZE	NC AND UNC	NC AND UNF	NS	BASIC	MIN.	MAX.	MIN.	MAX.	BASIC PITCH DIA.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
0	**	80	**	.0600	.0605	.0616	.0609	.0624	.0519	.0519	.0524	.0524	.0529	****	****	.0521	.0531
1	64	**	**	.0730	.0736	.0750	.0740	.0755	.0629	.0629	.0634	.0634	.0639	****	****	.0631	.0641
1	**	72	**	.0730	.0736	.0748	.0740	.0755	.0640	.0640	.0645	.0645	.0650	****	****	.0642	.0652
2	56	**	**	.0860	.0867	.0883	.0872	.0887	.0744	.0744	.0749	.0749	.0754	****	****	.0746	.0756
2	**	64	**	.0860	.0866	.0880	.0870	.0885	.0759	.0759	.0764	.0764	.0769	****	****	.0761	.0771
3	48	**	**	.0990	.0999	.1017	.1003	.1018	.0855	.0855	.0860	.0860	.0865	****	****	.0857	.0867
3	**	56	**	.0990	.0997	.1013	.1002	.1017	.0874	.0874	.0879	.0879	.0884	****	****	.0876	.0876
4	**	**	36	.1120	.1135	.1156	.1137	.1157	.0940	****	****	.0945	.0950	****	****	.0942	.0957
4	40	**	**	.1120	.1133	.1152	.1136	.1156	.0958	.0958	.0963	.0963	.0968	****	****	.0960	.0975
4	**	48	**	.1120	.1129	.1147	.1133	.1153	.0985	.0985	.0990	.0990	.0995	****	****	.0987	.1002
5	40	**	**	.1250	.1263	.1282	.1266	.1286	.1088	.1088	.1093	.1093	.1098	****	****	.1090	.1105
5	**	44	**	.1250	.1263	.1280	.1264	.1284	.1102	.1102	.1107	.1107	.1112	****	****	.1104	.1119
6	32	**	**	.1380	.1401	.1421	.1402	.1422	.1177	.1177	.1182	.1182	.1187	.1187	.1192	.1182	.1197
6	**	40	**	.1380	.1393	.1412	.1396	.1416	.1218	.1218	.1223	.1223	.1228	****	****	.1220	.1235
8	32	**	**	.1640	.1661	.1681	.1662	.1682	.1437	.1437	.1442	.1442	.1447	.1447	.1452	.1442	.1457
8	**	36	**	.1640	.1655	.1676	.1657	.1677	.1460	.1460	.1465	.1465	.1470	****	****	.1462	.1477
10	24	**	**	.1900	.1927	.1954	.1928	.1948	.1629	.1629	.1634	.1634	.1639	.1639	.1644	.1634	.1649
10	**	32	**	.1900	.1921	.1941	.1922	.1942	.1697	.1697	.1702	.1702	.1707	.1707	.1712	.1702	.1717
12	24	**	**	.2160	.2187	.2214	.2188	.2208	.1889	.1889	.1894	****	****	.1899	.1904	.1894	.1909
12	**	28	**	.2160	.2183	.2206	.2184	.2204	.1928	.1928	.1933	****	****	.1938	.1943	.1933	.1948

TABLE 327

Standard Hand Taps for Tapping Unified and American National Coarse and Fine Threads

	THREADS PER INCH			MAJOR DIAMETER					PITCH DIAMETER LIMITS																	
				GROUND THREAD			CUT THREAD		GROUND THREAD																CUT THD.	
									L1 LIMIT			H1 LIMIT		H2 LIMIT		H3 LIMIT		H4 LIMIT		H5 LIMIT		H6 LIMIT		H8 LIMIT		
SIZE	NC AND UNC	NF AND UNF	NS	BASIC	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	BASIC PITCH DIA.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MAX.	
1/4	20	**	**	.2500	.2533	.2565	.2532	.2557	.2170	.2175	.2175	.2175	.2180	.2180	.2185	.2185	.2190	****	****	.2195	.2200	****	****	****	****	.2180	.2200
1/4	**	28	**	.2500	.2523	.2546	.2524	.2549	****	****	.2268	.2268	.2273	.2273	.2278	.2278	.2283	.2283	.2288	****	****	****	****	****	****	.2273	.2288
5/16	18	**	**	.3125	.3161	.3197	.3160	.3185	.2759	.2764	.2764	.2764	.2769	.2769	.2774	.2774	.2779	****	****	.2784	.2789	****	****	****	****	.2769	.2288
5/16	**	24	**	.3125	.3152	.3179	.3153	.3178	****	****	.2854	.2854	.2859	.2859	.2864	.2864	.2869	.2869	.2874	****	****	****	****	****	****	.2859	.2874
3/8	16	**	**	.3750	.3790	.3831	.3789	.3814	.3339	.3344	.3344	.3344	.3349	.3349	.3354	.3354	.3359	****	****	.3364	.3369	****	****	****	****	.3349	.3369
3/8	**	24	**	.3750	.3777	.3804	.3778	.3803	****	****	.3479	.3479	.3484	.3484	.3489	.3489	.3494	.3494	.3499	****	****	****	****	****	****	.3484	.3499
7/16	14	**	**	.4375	.4422	.4468	.4419	.4449	.3906	.3911	.3911	.3911	.3916	.3916	.3921	.3921	.3926	****	****	.3931	.3936	****	****	****	****	.3916	.3941
7/16	**	20	**	.4375	.4408	.4440	.4407	.4437	****	****	.4050	.4050	.4055	.4055	.4060	.4060	.4065	****	****	.4070	.4075	****	****	****	****	.4055	.4075
1/2	13	**	**	.5000	.5050	.5100	.5047	.5077	.4495	.4500	.4500	.4500	.4505	.4505	.4510	.4510	.4515	****	****	.4520	.4525	****	****	****	****	.4505	.5430
1/2	**	20	**	.5000	.5033	.5065	.5032	.5062	****	****	.4675	.4675	.4680	.4680	.4685	.4685	.4690	****	****	.4695	.4700	****	****	****	****	.4680	.4700
9/16	12	**	**	.5625	.5679	.5733	.5675	.5705	****	****	.5084	.5084	.5089	.5089	.5094	.5094	.5099	****	****	.5104	.5109	****	****	****	****	.5089	.5114
9/16	**	18	**	.5625	.5661	.5697	.5660	.5690	****	****	.5264	.5264	.5269	.5269	.5274	.5274	.5279	****	****	.5284	.5289	****	****	****	****	.5269	.5289
5/8	11	**	**	.6250	.6309	.6368	.6304	.6334	****	****	.5660	.5660	.5665	.5665	.5670	.5670	.5675	****	****	.5680	.5685	****	****	****	****	.5665	.5690
5/8	**	18	**	.6250	.6286	.6322	.6285	.6315	****	****	.5889	.5889	.5894	.5894	.5899	.5899	.5904	****	****	.5909	.5914	****	****	****	****	.5894	.5914
11/16	**	**	11	.6875	.6934	.6993	.6929	.6996	****	****	.6285	****	****	****	****	.6295	.6300	****	****	****	****	****	****	****	****	.6290	.6320
11/16	**	**	16	.6875	.6915	.6956	.6914	.6954	****	****	.6469	****	****	****	****	.6479	.6484	****	****	****	****	****	****	****	****	.6474	.6499
3/4	10	**	**	.7500	.7565	.7630	.7559	.7599	****	****	.6850	.6850	.6855	.6855	.6860	.6860	.6865	****	****	.6870	.6875	****	****	****	****	.6855	.6885
3/4	**	16	**	.7500	.7540	.7581	.7539	.7579	****	****	.7094	.7094	.7099	.7099	.7104	.7104	.7109	****	****	.7114	.7119	****	****	****	****	.7099	.7124
7/8	9	**	**	.8750	.8822	.8894	.8820	.8860	****	****	.8028	.8028	.8033	.8033	.8038	****	****	.8043	.8048	****	****	.8053	.8058	****	****	.8038	.8068
7/8	**	14	**	.8750	.8797	.8843	.8799	.8839	****	****	.8286	.8286	.8291	.8291	.8296	****	****	.8301	.8306	****	****	.8311	.8316	****	****	.8296	.8321
1	8	**	**	1.0000	1.0081	.10162	1.0078	1.0118	****	****	.9188	.9188	.9193	.9193	.9198	****	****	.9203	.9208	****	****	.9213	.9218	****	****	.9198	.9228
1	**	12	**	1.0000	1.0054	1.0108	1.0055	1.0095	****	****	.9459	****	****	****	****	****	****	.9474	.9479	****	****	****	****	****	****	.9469	.9499
1	**	**	14	1.000	1.0047	1.0093	1.0049	1.0089	****	****	.9536	****	****	.9541	.9546	****	****	.9551	.9556	****	****	.9561	.9566	****	****	.9546	.9571
1-1/8	7	**	**	1.1250	1.1343	1.1436	1.1337	1.1382	****	****	1.0322	****	****	****	****	****	****	1.0332	1.0342	****	****	****	****	****	****	1.0332	1.0367
1-1/8	**	12	**	1.1250	1.1304	1.1358	1.1305	1.1350	****	****	1.0709	****	****	****	****	****	****	1.0719	1.0729	****	****	****	****	****	****	1.0719	1.0749
1-1/4	7	**	**	1.2500	1.2593	1.2686	1.2587	1.2632	****	****	1.1572	****	****	****	****	****	****	1.1582	1.1592	****	****	****	****	****	****	1.15482	1.1617
1-1/4	**	12	**	1.2500	1.2554	1.2608	1.2555	1.2600	****	****	1.1959	****	****	****	****	****	****	1.1969	1.1979	****	****	****	****	****	****	1.1969	1.9999
1-3/8	6	**	**	1.3750	1.3859	1.3967	1.3850	1.3895	****	****	1.2667	****	****	****	****	****	****	1.2677	1.2687	****	****	****	****	****	****	1.2677	1.2712
1-3/8	**	12	**	1.3750	1.3804	1.3858	1.3805	1.3850	****	****	1.3209	****	****	****	****	****	****	1.3219	1.3229	****	****	****	****	****	****	1.3219	1.3249
1-1/2	6	**	**	1.5000	1.5109	1.5217	1.5100	1.5145	****	****	1.3917	****	****	****	****	****	****	1.3927	1.3937	****	****	****	****	****	****	1.3927	1.3962
1-1/2	**	12	**	1.500	1.5054	1.5108	1.5055	1.5100	****	****	1.4459	****	****	****	****	****	****	1.4469	1.4479	****	****	****	****	****	****	1.4499	1.4469

To Order

WHEN ORDERING OR REQUESTING QUOTATIONS FOR STANDARD OR SPECIAL TAPS, PLEASE SPECIFY:

1. Quantity _____
2. List number _____ and Catalog number _____
3. Inch size _____ or Metric size _____
4. Threads per inch _____ or Metric pitch _____ RH or LH* _____
5. Thread designation (NC, NPT, etc.) _____
6. Thread limit _____ or Class of fit required _____
7. Number of flutes _____ Straight or spiral* _____ RH or LH* _____
8. Style of chamfer _____
9. Material being tapped _____ and Hardness _____
10. Required thread depth _____
11. Depth of hole _____
12. Type of hole: Thru _____ Blind _____ Interrupted _____
13. Number of starts, if multiple thread* _____
14. Overall length* _____ Thread length* _____
15. Shank length* _____ Shank diameter* _____ and Style* _____
16. Depth of flutes* _____ Degree of hook or rake* _____
17. Other* _____
18. Describe machine being used _____ and Coolant _____

In addition to the above information, it is helpful when a print or sample of the part being tapped is furnished.
*Important information for special taps.

Tap Drill Sizes for Unified Inch Screw Thread

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

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 Screw Thread Inserts

TAP SIZE	ALUMINUM				STEEL, PLASTIC, MAGNESIUM			
	TAP DRILL SIZE	DECIMAL EQUIV. OF TAP DRILL (INCHES)	MINOR DIA. LIMITS (AFTER TAPPING)		TAP DRILL SIZE	DECIMAL EQUIV. OF TAP DRILL (INCHES)	MINOR DIA. LIMITS (AFTER TAPPING)	
			MIN.	MAX.			MIN.	MAX.
4-40	#31	.1200	.116	.121	#31	.1200	.119	.124
5-40	#30	.1285	.128	.133	#29	.1360	.131	.136
6-32	#25	.1495	.144	.150	#25	.1495	.148	.154
6-40	#26	.1470	.144	.149	#25	.1495	.148	.153
8-32	#17	.1730	.170	.176	#16	.1770	.174	.180
10-24	13/64	.2031	.199	.205	#5	.2055	.203	.209
10-32	#7	.2010	.196	.202	13/64	.2031	.200	.206
12-24	#2	.2210	.221	.227	#1	.2280	.225	.231
1/4-20	17/64	.2656	.261	.267	17/64	.2656	.265	.271
1/4-28	G	.2610	.257	.264	17/64	.2656	.261	.268
5/16-18	Q	.3320	.328	.334	Q	.3320	.331	.337
5/16-24	21/64	.3281	.323	.330	Q	.3320	.327	.334
3/8-16	X	.3970	.390	.398	X	.3970	.396	.402
3/8-24	25/64	.3906	.385	.392	25/64	.3906	.389	.396
7/16-14	29/64	.4531	.453	.463	15/32	.4687	.461	.471
7/16-20	29/64	.4531	.450	.458	29/64	.4531	.453	.461
1/2-13	33/64	.5156	.515	.525	17/32	.5312	.523	.533
1/2-20	33/64	.5156	.513	.522	33/64	.5156	.515	.524

NOTE: Tap Drills listed above should produce holes within the required limits. However, variations in material and equipment may require the use of drills which are larger or smaller than those recommended.
NOTE: Minor Diameter Limits for steel, plastic, and magnesium are such as to allow for material contraction and provide maximum tap life.

Tap Drill Sizes for Unified Inch Screw Thread

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

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 Screw Thread Inserts

TAP SIZE	ALUMINUM				STEEL, PLASTIC, MAGNESIUM			
	TAP DRILL SIZE	DECIMAL EQUIV. OF TAP DRILL (INCHES)	MINOR DIA. LIMITS (AFTER TAPPING)		TAP DRILL SIZE	DECIMAL EQUIV. OF TAP DRILL (INCHES)	MINOR DIA. LIMITS (AFTER TAPPING)	
			MIN.	MAX.			MIN.	MAX.
4-40	#31	.1200	.116	.121	#31	.1200	.119	.124
5-40	#30	.1285	.128	.133	#29	.1360	.131	.136
6-32	#25	.1495	.144	.150	#25	.1495	.148	.154
6-40	#26	.1470	.144	.149	#25	.1495	.148	.153
8-32	#17	.1730	.170	.176	#16	.1770	.174	.180
10-24	13/64	.2031	.199	.205	#5	.2055	.203	.209
10-32	#7	.2010	.196	.202	13/64	.2031	.200	.206
12-24	#2	.2210	.221	.227	#1	.2280	.225	.231
1/4-20	17/64	.2656	.261	.267	17/64	.2656	.265	.271
1/4-28	G	.2610	.257	.264	17/64	.2656	.261	.268
5/16-18	Q	.3320	.328	.334	Q	.3320	.331	.337
5/16-24	21/64	.3281	.323	.330	Q	.3320	.327	.334
3/8-16	X	.3970	.390	.398	X	.3970	.396	.402
3/8-24	25/64	.3906	.385	.392	25/64	.3906	.389	.396
7/16-14	29/64	.4531	.453	.463	15/32	.4687	.461	.471
7/16-20	29/64	.4531	.450	.458	29/64	.4531	.453	.461
1/2-13	33/64	.5156	.515	.525	17/32	.5312	.523	.533
1/2-20	33/64	.5156	.513	.522	33/64	.5156	.515	.524

NOTE: Tap Drills listed above should produce holes within the required limits. However, variations in material and equipment may require the use of drills which are larger or smaller than those recommended.
NOTE: Minor Diameter Limits for steel, plastic, and magnesium are such as to allow for material contraction and provide maximum tap life.

Tap Drill Sizes for Metric Screw Threads

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

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.

Forming Tap Drill Sizes for Unified Inch Screw Threads

TAP SIZE	TAP DRILL SIZE	DECIMAL EQUIV. OF TAP DRILL (INCHES)	PROBABLE PERCENT OF THREAD ENGMT.
0-80	1.33mm	.0524	73
	1.35mm	.0531	63
	1.37mm	.0539	54
1-64	52	.0635	75
	1.64mm	.0646	65
	1.67mm	.0657	54
1-72	1.64mm	.0646	73
	1.66mm	.0654	65
	1.68mm	.0661	57
2-56	1.92mm	.0756	73
	1.94mm	.0764	66
	1.97mm	.0776	57
2-64	1.95mm	.0768	72
	1.97mm	.0776	65
	47	.0785	55
3-48	2.2mm	.0866	76
	2.24mm	.0882	65
	43	.0890	59
3-56	2.24mm	.0882	76
	43	.0890	69
	2.3mm	.0906	56
4-40	40	.0980	72
	39	.0995	64
	2.57mm	.1012	54
4-48	39	.0995	76
	2.57mm	.1012	65
	2.6mm	.1024	56
5-40	2.8mm	.1102	77
	2.85mm	.1122	65
	33	.1130	60
5-44	2.85mm	.1122	72
	33	.1130	66
	2.91mm	.1146	57
6-32	3.05mm	.1201	76
	3.1mm	.1220	67
	3.16mm	.1244	56
6-40	3.15mm	.1240	72
	3.18mm	.1252	65
	3.23mm	.1272	54
8-32	3.7mm	.1457	78
	3.75mm	.1476	69
	25	.1495	59
8-36	3.75mm	.1476	77
	25	.1495	67
	3.85mm	.1516	56
10-24	19	.1660	78
	18	.1695	65
	11/64	.1719	57
10-32	11/64	.1719	76
	4.42mm	.1740	66
	4.45mm	.1752	61
12-24	4.9mm	.1929	75
	4.95mm	.1949	68
	5.0mm	.1969	61
12-28	9	.1960	74
	5.05mm	.1988	63
	5.1mm	.2008	55
1/4-20	5.65mm	.2224	75
	5.7mm	.2244	69
	1	.2280	58
1/4-28	5.85mm	.2303	73
	5.88mm	.2315	68
	15/64	.2344	55
5/16-18	9/32	.2813	77
	7.25mm	.2854	66
	7.3mm	.2874	60
5/16-24	7.35mm	.2894	74
	7.4mm	.2913	67
	7.45mm	.2933	60
3/8-16	8.65mm	.3406	75
	8.75mm	.3445	66
	S	.3480	57
3/8-24	8.9mm	.3504	78
	9.0mm	.3543	64
	9.05mm	.3563	57
7/16-14	X	.3970	78
	10.2mm	.4016	69
	13/32	.4063	59
7/16-20	10.4mm	.4094	75
	Z	.4130	63
	10.54mm	.4150	58
1/2-13	11.6mm	.4567	77
	11.75mm	.4626	66
	11.8mm	.4646	62
1/2-20	12.0mm	.4724	73
	12.1mm	.4764	61
	12.15mm	.4783	55
9/16-12	33/64	.5156	77
	13.25mm	.5217	67
	13.4mm	.5276	56
9/16-18	17/32	.5313	74
	13.6mm	.5354	64
5/8-11	14.6mm	.5748	76
	14.75mm	.5807	66
	14.85mm	.5846	60
5/8-18	19/32	.5938	73
	15.2mm	.5984	62
	15.25mm	.6004	56
3/4-10	17.7mm	.6969	73
	17.8mm	.7008	67
	17.9mm	.7047	61
3/4-16	18.2mm	.7165	70
	18.3mm	.7205	61
7/8-9	13/16	.8125	77
	20.8mm	.8189	69
	21.0mm	.8268	59
7/8-14	21.25mm	.8366	71
	21.4mm	.8425	58
1-8	15/16	.9375	68
	24.0mm	.9449	60
1-12	61/64	.9531	74
	24.5mm	.9646	55

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.

Forming Tap Drill Sizes for Metric Screw Threads

TAP SIZE	TAP DRILL SIZE	DECIMAL EQUIV. OF TAP DRILL (INCHES)	PROBABLE PERCENT OF THREAD ENGMT.
M2x.35	1.39mm	.0547	72
	1.41mm	.0555	64
	1.43mm	.0563	55
M2x.4	1.76mm	.0693	74
	50	.0700	67
	1.81mm	.0713	55
M3x.45	2.24mm	.0882	71
	43	.0890	65
	2.29mm	.0902	55
M3x.5	2.7mm	.1063	75
	2.75mm	.1083	61
M4x.6	3.15mm	.1240	75
	3.18mm	.1252	67
	3.22mm	.1268	57
M4x.7	3.6mm	.1417	74
	3.65mm	.1437	64
	3.68mm	.1449	57
M5x.75	4.06mm	.1598	77
	4.1mm	.1614	69
	4.15mm	.1634	59
M5x.8	4.55mm	.1791	73
	4.6mm	.1811	64
	4.65mm	.1831	55
M6x1	5.45mm	.2146	73
	5.5mm	.2165	66
	7/32	.2188	57
M7x1	6.45mm	.2539	72
	6.5mm	.2559	65
	6.55mm	.2579	58
M8x1.25	7.3mm	.2874	75
	L	.2900	67
	7.45mm	.2933	57
M10x1.25	9.3mm	.3661	74
	U	.3680	69
	9.45mm	.3720	56
M10x1.5	9.15mm	.3602	77
	9.25mm	.3642	67
	9.35mm	.3681	57
M12x1.25	11.3mm	.4449	73
	11.35mm	.4469	67
	11.4mm	.4488	61
M12x1.75	11.0mm	.4331	78
	7/16	.4375	68
	11.25mm	.4429	57
M14x1.5	13.2mm	.5197	70
	13.25mm	.5217	65
	13.3mm	.5236	60
M14x2	12.9mm	.5079	75
	13.0mm	.5118	67
	33/64	.5156	60
M16x1.5	15.1mm	.5945	79
	15.2mm	.5984	69
	15.3mm	.6024	60
M16x2	14.85mm	.5846	78
	15.0mm	.5906	67
	19/32	.5938	61
M18x1.5	17.2mm	.6772	69
	17.3mm	.6811	59
M18x2.5	21/32	.6563	73
	16.8mm	.6614	65
	16.9mm	.6654	59
M20x1.5	19.1mm	.7520	78
	19.2mm	.7559	68
	19.3mm	.7598	58
M20x2.5	18.6mm	.7323	76
	18.75mm	.7382	67
	18.9mm	.7441	58
M24x1.5	23.2mm	.9134	66
	23.25mm	.9154	61
M24x3	22.4mm	.8819	73
	22.5mm	.8858	68
	57/64	.8906	62

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.

Tapping Information

MATERIAL		TAPPING SPEED FPM THREADS PER INCH 7 OR LESS	8-15	16-24	OVER 24	SUFACE TREATMENT OR COATING
Zinc & Magnesium Alloys -	Wrought & Cast	65	77	88	100	04, 88, 89
Aluminum Alloys -	Wrought	50	67	83	100	04, 88, 89
	Cast	50	67	83	100	04, 88, 89, 90
Brass		50	60	70	80	02, 04, 82, 88
Cast Iron -	Gray, As Cast	25	28	32	35	23, 84, 89
Copper		25	28	32	35	02, 04, 82, 88
Iron -	Ductile & Malleable	20	27	33	40	03, 23, 84, 88, 89, 90
Bronze		20	25	30	35	02, 04, 82, 88
Carbon Steel -	Low Carbon, 1029, Also Leaded	20	30	40	50	03, 23, 84, 88, 89, 90
	Medium Carbon, 1030-1055	20	23	27	30	03, 23, 84, 88, 89, 90
Alloy Steel -	4xxx Series	15	18	22	25	03, 23, 84, 88, 89, 90
Stainless Steel -	Free Machining, Cold Drawn	20	27	33	40	03, 23, 84, 88, 89, 90
	300 Series, Cold Drawn	15	18	22	25	03, 23, 84, 88, 89, 90
	Precipitation Hardening	8	12	16	20	03, 23, 84, 88, 89, 90
Titanium Alloys -	Under Rc30	15	18	22	25	04, 23, 82, 84, 90
	Rc 30 - 40	5	8	12	15	04, 23, 82, 84, 90
Tool & Die Steels -	S, L, A, O & D Series	10	13	17	20	03, 23, 84, 88, 89, 90
High Temperature Alloys -	Monel, Nickel	8	12	16	20	23, 82, 84, 88, 89, 90
	Inconel	5	7	8	10	23, 82, 84, 88, 89, 90

Tapping speeds shown are approximate and may vary for each application.

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.

CALCULATIONS FOR SPEED

RPM = (3.82 x FPM) / DIA.
FPM = (RPM x DIA.) / 3.82

Standard Marking Symbols for Taps

CODE	DESCRIPTION
NC	American National Coarse Thread Series
UNC	Unified Coarse Thread Series
NF	American National Fine Thread Series
UNF	Unified Fine Thread Series
NEF	American National Extra-Fine Thread Series
UNEF	Unified Extra-Fine Thread Series
N	American National 8, 12 and 16 Thread Series (8N, 12N, 16N)
UN	Unified Constant-Pitch Thread Series
NS	American National Thread – Special
UNS	Unified Thread – Special
UNM	Unified Miniature Thread Series
NR	American National Thread with a .018P to .144P Controlled Root Radius
UNR	Unified Constant-Pitch Thread Series with a .108P to .144P Controlled Root Radius
UNRC	Unified Coarse Thread Series with a .108P to .144P Controlled Root Radius
UNRF	Unified Fine Thread Series with a .108P to .144P Controlled Root Radius
*UNJ	Unified Thread Series with a .15011P to .18042P Controlled Root Radius
*UNJC	Unified Coarse Thread Series with a .15011P to .18042P Controlled Root Radius
*UNJF	Unified Fine Thread Series with a .15011P to .18042P Controlled Root Radius
NH	American National Hose Coupling and Firehose Coupling Threads
NPS	American Standard Straight Pipe Thread
NPSC	American Standard Straight Pipe Thread in Pipe Couplings (Mark NPS)
NPSF	Dryseal American Standard Pipe Thread (Fuel)
NPSH	American Standard Straight Pipe Thread for Hose Couplings and Nipples
NPSI	American Standard Dryseal Intermediate Straight Pipe Thread
NPSL	American Standard Straight Pipe Thread for Loose-Fitting Mechanical Joints with Locknuts
NPSM	American Standard Straight Pipe Threads for Free-Fitting Mechanical Joints for Fixtures (Mark NPS)
ANPT	Aeronautical National Form Taper Pipe Thread
NPT	American Standard Taper Pipe Thread
NPTF	Dryseal American Standard Taper Pipe Thread (Fuel)
NPTR	American Standard Taper Pipe Thread for Railing Joints (Mark NPT)
NGO	National Gas Outlet Thread R. H. or L. H.
NGS	National Gas Straight Thread
NGT	National Gas Taper Thread
PTF	Dryseal SAE Short Taper Pipe Thread
ACME-C	Acme Thread Centralizing
ACME-G	Acme Thread General Purpose
STUB ACME	Stub Acme Thread
N BUTT	American Buttress Thread
STI	Special Thread for Helical Wire Screw Thread Inserts
SGT	Special Gas Taper Thread

*Root Radius required on Male thread only.

CONTACT

CONTACT US

FASTCUT TOOL
200 FRONT STREET
MILLERSBURG, PA 17061

1-800-682-8832
Fax 717-692-2707

Toll Free 800-682-8832

Customer Service 800-682-8832
Technical Support 800-682-8832

www.fastcut.com

To find a distributor, go to www.fastcut.com and click on the "Distributor Search" button or simply contact customer service.

FASTCUT TOOL™

200 Front Street • Millersburg, PA 17061 • 800-682-8832 • fastcut.com

Form No. 62-23012 5/06

ISO 9001 Certified