



TAPS AND DIES 2006



American Made
American Owned
Since 1881



Since 1881 Brubaker Tool has been a leading supplier of American-made, industrial cutting tools. Brubaker's longstanding stability, reliability, 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 commitment to American manufacturing.

Much has changed in business in the last 125 years. Our commitment to providing the finest high-speed steel, cobalt, powdered metal and solid carbide round tools has not. For over a century and a quarter, Brubaker has continued to manufacture in Millersburg, PA, in the same location on the banks of the Susquehanna River. While our location has not changed, our methods and equipment certainly have. Our modern manufacturing facilities are equipped with the latest CNC equipment in the cutting tool industry. Our quality assurance systems, including ISO 9001 certification, ensure consistent, quality products and superior service levels.

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 Brubaker has remained a leading supplier to American industry for over 125 years.

American Made
American Owned
Since 1881

CONTINUE THE TRADITION.



STYLE	LIST NO.	PAGE
HIGH SPEED STEEL / GROUND THREAD		
Machine Screw	102	1
Hand	106	2
Hand, For Cast Iron	107	5
Hand, Eight Pitch	108	6
Hand, .005 Oversize Series	109	6
Spiral Pointed, Plug	110	7
Spiral Pointed, Bottom	112	9
Spiral Pointed, Fluteless	114	10
Spiral Pointed, Plug, .005 Oversize	117	10
Spiral Fluted, 30°	118	11
Spiral Fluted, 50°	120	11
Screw Thread Insert, Machine Screw & Hand	122	13
Screw Thread Insert, Spiral Pointed, Plug	123	13
Thread Forming, True Lead	124	14
Thread Forming, True Lead, Taper Pipe	124T	16
Nut	126	16
Pulley	127	17
Taper Pipe, Regular For Cast Iron	130	17
Taper Pipe, Dryseal For Cast Iron	132	18
Taper Pipe, Regular	134	18
Taper Pipe, Interrupted	136	19
Taper Pipe, Dryseal	138	19
Taper Pipe, Dryseal Interrupted	140	20

STYLE	LIST NO.	PAGE
Taper Pipe, Aeronautical	142	20
Taper Pipe, Short Projection	144	21
Straight Pipe	150	21
Straight Pipe, Dryseal	152	22
PREMIUM STEEL / HIGH PERFORMANCE		
Spiral Pointed, Plug	170	23
Spiral Fluted	172	24
TITANIUM NITRIDED		
Machine Screw	190	25
Hand	192	25
Spiral Pointed, Plug	194	26
Spiral Fluted 50°	197	27
METRIC		
Hand, Cast Iron	107	5
Thread Forming, True Lead, Metric	124M	15
Hand	230	28
Spiral Pointed, Plug	232	29
Spiral Fluted, 50°	234	30
Hand, Spark Plug	236	30
NOTE: See Page ii for Standard Tap Package Quantities.		

Taps

HIGH SPEED STEEL		
Adjustable Round Split	401	31

CARBON STEEL		
Hexagon Rethreading	305	32
Hexagon Rethreading, Sets	306	32

Dies

Standard Hand Taps, Dimensions, Screw, Fractional and Metric Sizes	33
Standard Pipe Taps, Dimensions, Straight and Taper, Ground Thread	34
American National And Dryseal, American National Standard Taper Pipe Threads	35
Measurement of Taper Pipe Taps, Reaming Data And Tap Drill Sizes	36
Tap Recommendations For Classes 2, 3, 2B & 3B Unified And American Screw Threads	37 & 38
Forming Tap Recommendations For Classes 2, 2B & 3B Unified And American Screw Threads	39
Tap Recommendations For Classes 4H & 6H Metric Screw Threads	40

Standard Machine Screw Taps For Tapping Unified And American National Coarse And Fine Threads	41
Standard Hand Taps For Tapping Unified And American National Coarse And Fine Threads	42
Ordering Information For Taps	43
Tap Drill Sizes For Unified Inch Screw Threads	44
Tap Drill Sizes For Screw Thread Inserts	45
Tap Drill Sizes For Metric Screw Threads	46
Forming Tap Drill Sizes For Unified Inch Screw Threads	47
Forming Tap Drill Sizes For Metric Screw Threads	48
Tapping Information and Surface Treatments & Coatings	49
Standard Marking Symbols For Taps	50

Technical Information

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

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

Brubaker 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 Brubaker Tool, be returned freight prepaid to Brubaker Tool and which, upon inspection, is determined by Brubaker 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 Brubaker 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. Brubaker 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 Brubaker Tool be liable for any special, incidental or consequential damages. Brubaker 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.

SIZE	NC NS	NF	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		

Machine Screw High Speed Steel

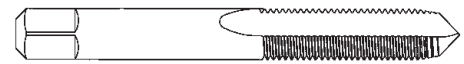
THREAD FORM

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



LIST
102

continued

LIST
102 *continued*Machine Screw
High Speed Steel

SIZE	NC NF		H-LIMIT	FLUTES	EDP NO.			
	NS				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

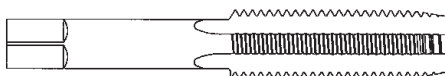
THREAD FORM

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		H-LIMIT	FLUTES	EDP NO.			
	NS				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

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*Hand
High Speed Steel*continued*

LIST
106 *continued*Hand
High Speed Steel

SIZE	NC NS	NF	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**

SIZE	NC NF	H-LIMIT	FLUTES	EDP NO.	
				PLUG	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

**Hand, For Cast Iron
High Speed Steel**

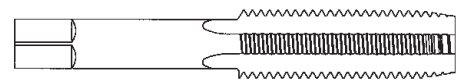
THREAD FORM

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	PITCH	D-LIMIT	FLUTES	EDP NO.	
				PLUG	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

**Nitride and Steam
Oxide Treated**

SIZE	PITCH	D-LIMIT	FLUTES	EDP NO.	
				PLUG	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

Bright Finish

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

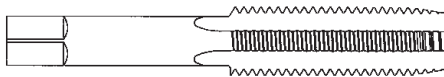
THREAD FORM

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	H-LIMIT	FLUTES	EDP NO.		
	NS				TAPER	PLUG	BOTTOM
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.

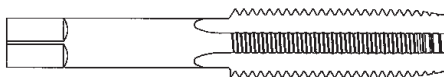
LIST 109 Hand, .005 Oversize High Speed Steel

THREAD FORM

American National

CHAMFER STYLE

Plug (3 to 5 threads)



SIZE	NC	NF	H-LIMIT	FLUTES	EDP NO.	
	NS				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.

SIZE	NC NF		H-LIMIT	FLUTES	EDF NO.		
	NS				TAPER	PLUG	BOTTOM
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

Spiral Pointed, Plug High Speed Steel

THREAD FORM

American National

CHAMFER STYLE

Plug (3 to 5 threads)



**LIST
110**

LIST
110 *continued*Spiral Pointed, Plug
High Speed Steel

SIZE	NC	NF	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		

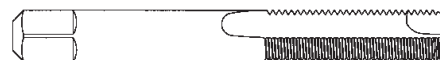
These taps are primarily designed for tapping short, blind holes which require full threads close to the bottom of the hole. While the spiral point pushes chips into the hole, removal of the male center creates additional chip space at the front of the tap to accommodate these chips. The thicker chip, 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.

SIZE	NC NF NS	H-LIMIT	FLUTES	EDP NO.			SET
				TAPER	PLUG	BOTTOM	
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	

Spiral Pointed, Bottom High Speed Steel

THREAD FORM
American National

CHAMFER STYLE
Bottoming (1 to 2 threads)



LIST
112

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		H-LIMIT	GASHES	EDP NO.		
	NS				TAPER	PLUG	BOTTOM
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		H-LIMIT	FLUTES	EDP NO.	
	NS				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.

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	

Spiral Fluted, 30° Helix High Speed Steel

LIST 118

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



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.

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	

continued

Spiral Fluted, 50° Helix High Speed Steel

LIST 120

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



LIST
120 *continued*Spiral Fluted, 50° Helix
High Speed Steel

SIZE	NC NS	NF	H-LIMIT	FLUTES	EDP NO.			
					TAPER	PLUG	BOTTOM	SET
6-40	NF		GH2	2		---	12017	
8-32	NC		GH1	3		12018	12019	
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.

SIZE	NC NF		H-LIMIT	FLUTES	EDP NO.	
	NS				PLUG	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

Machine Screw & Hand, Screw Thread Insert High Speed Steel

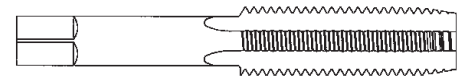
LIST 122

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



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.

SIZE	NC NF		H-LIMIT	FLUTES	EDP NO.	
	NS				PLUG	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	

Spiral Pointed, Screw Thread Insert High Speed Steel

LIST 123

THREAD FORM

American National

CHAMFER STYLE

Plug (3 to 5 threads)



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

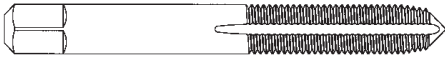
THREAD FORM

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		EDP NO.	
	NS	H-LIMIT	PLUG	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**

SIZE	NC NF NS	H-LIMIT	EDP NO.	
			PLUG	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

continued

Thread Forming,
True Lead
High Speed Steel

SIZE	PITCH	D-LIMIT	EDP NO.	
			PLUG	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

**LIST
124M**

Thread Forming,
True Lead, Metric
High Speed Steel

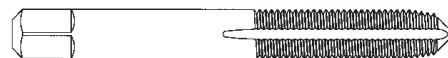
THREAD FORM

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.

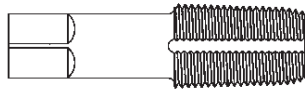


LIST
124TThread Forming,
True Lead, Taper Pipe
High Speed Steel**THREAD FORM**

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

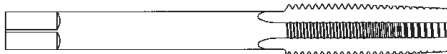
These taps are designed to tap nuts. They have a very long chamfer, which produces low chip loads. The tap is not reversed and the nuts pass on to the long shank where they accumulate. When the shank becomes loaded with nuts, the tap is removed and the nuts are dumped from the shank. A variety of surface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

LIST
126Nut
High Speed Steel**THREAD FORM**

American National

CHAMFER STYLE

Standard(16 to 24 threads)



SIZE	NC	NF	H-LIMIT	FLUTES	EDP NO.		
					TAPER	PLUG	BOTTOM
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**

SIZE	NC NS	NF	H-LIMIT	FLUTES	EDP NO.				THREAD LENGTH
					6" LENGTH	8" LENGTH	10" LENGTH	12" 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

**Pulley
High Speed Steel**

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**

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

**Taper Pipe, Regular,
For Cast Iron
High Speed Steel**

THREAD FORM

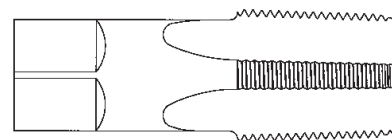
American Standard NPT, Regular

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



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

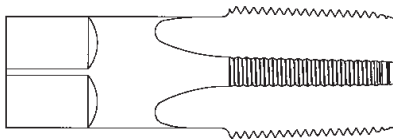
American Standard NPTF, Dryseal

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

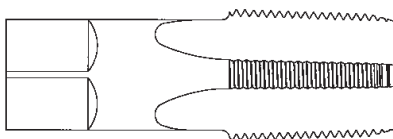
American Standard NPT, Regular

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.

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

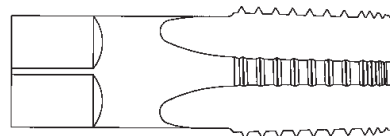
*Small Shank

Taper Pipe, Regular Interrupted Thread 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



LIST 136

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.

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

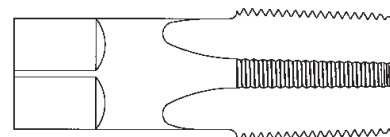
*Small Shank

Taper Pipe, Dryseal 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



LIST 138

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

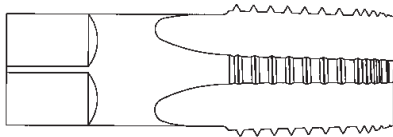
American Standard NPTF, Dryseal

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

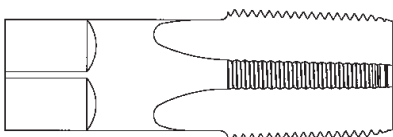
American Standard ANPT, Aeronautical

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.

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

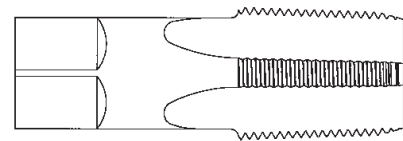
LIST 144

Taper Pipe, Dryseal Short Projection High Speed Steel

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.

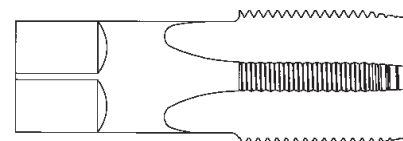
SIZE	TYPE	FLUTES	EDP NO.
1/8-27	NPS	4	15002
1/4-18	NPS	4	15006
3/8-18	NPS	4	15008
1/2-14	NPS	4	15010
3/4-14	NPS	5	15012
1-11-1/2	NPS	5	15014

LIST 150

Straight Pipe, Regular High Speed Steel

THREAD FORM
American Standard NPS, Regular

CHAMFER STYLE
Plug (3 to 5 threads)



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

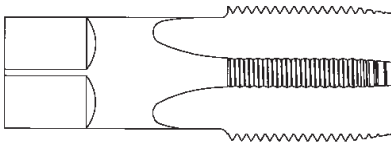
THREAD FORM

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.

SIZE	NC NF NS	H-LIMIT	FLUTES	EDP NO.	
				PLUG	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	

**LIST
170**

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

THREAD FORM

American National

CHAMFER STYLE

Plug (3 to 5 threads)



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.

SIZE	NC NF	H-LIMIT	FLUTES	EDP NO.	
				PLUG	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.

SIZE	NC NF	H-LIMIT	FLUTES	EDP NO.	
				PLUG	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

LIST
190Machine Screw,
Titanium Nitride Coated
High Speed Steel

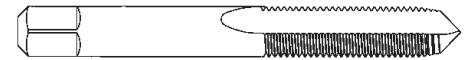
THREAD FORM

American National

CHAMFER STYLE

Plug (3 to 5 threads), Bottoming (1 to 2 threads)

If chamfer style is not specified, plug will be furnished

LIST
192Hand,
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



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		H-LIMIT	FLUTES	EDP NO.	
	NS				PLUG	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.

SIZE	NC NF		H-LIMIT	FLUTES	EDP NO.	
	NS				PLUG	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

LIST
197

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

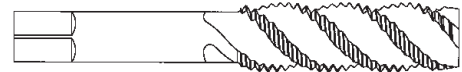
THREAD FORM

American National

CHAMFER STYLE

Plug (3 to 5 threads), Bottoming (1 to 2 threads)

If chamfer style is not specified, plug will be furnished



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

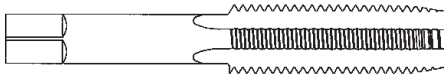
THREAD FORM

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	PLUG	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.

SIZE	PITCH	D-LIMIT	FLUTES	EDP NO.	
				PLUG	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	

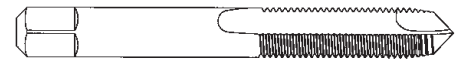
Spiral Pointed, Metric High Speed Steel

**LIST
232**
THREAD FORM

M-Profile

CHAMFER STYLE

Plug (3 to 5 threads)



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	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

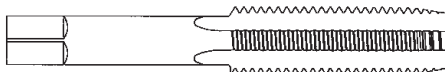
THREAD FORM

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	BOTTOM
M14	1.25	D7	4	23662	23663
M18	1.5	D7	4	23674	23675

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

Adjustable Round Split High Speed Steel

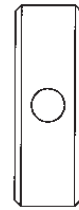
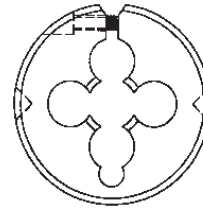
FRACTIONAL AND MACHINE SCREW SIZES

THREAD FORM

American National

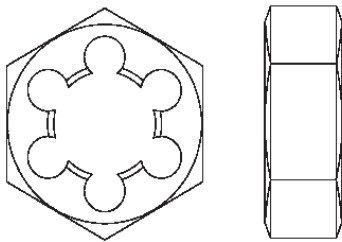
OUTSIDE DIAMETER	THICKNESS
---------------------	-----------

13/16"	1/4"
1"	3/8"
1-1/2"	1/2"
2"	5/8"



Hexagon Rethreading Carbon Steel

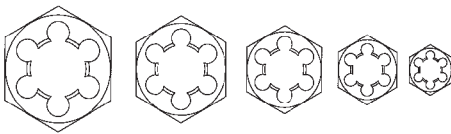
THREAD FORM
American National



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.

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.		MACHINENOMINAL 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

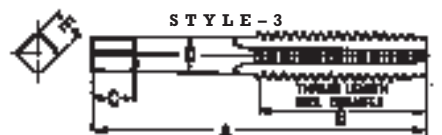
ELEMENT	NOMINAL DIAMETER RANGE-INCHES		DIRECTION	TOLERANCE-INCHES GROUND THREAD
	OVER	TO (INCL.)		
Length Overall-A	.052	1.010	Plus or Minus	1/32
	1.010	1.510	Plus or Minus	1/16
Length of Thread-B	.052	.223	Plus or Minus	3/64
	.223	.510	Plus or Minus	1/16
	.510	1.510	Plus or Minus	3/32
Length of Square-C	.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



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



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



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"

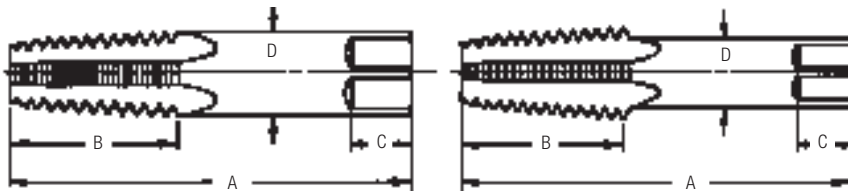


TABLE 357
American National Standard and Dryseal
American National Standard Taper Pipe Threads

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		

¹2-1/2" NPTF and ANPT L₃=.375, E₃=2.69609 ²3" NPTF and ANPT L₃=.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. L₁ distance. See columns K₀ and L₃.

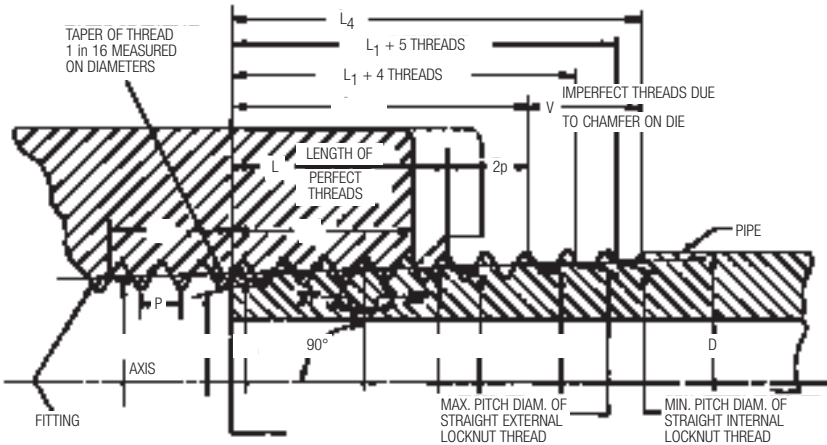
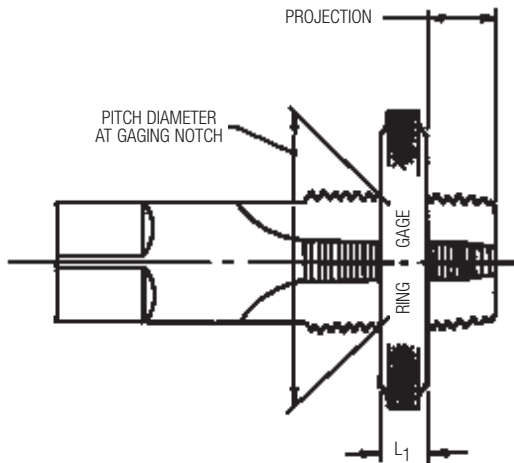


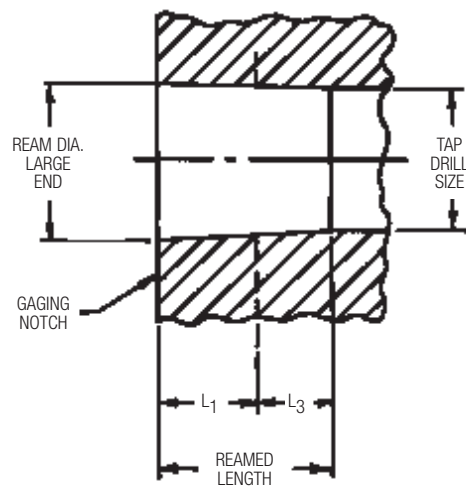
TABLE 357 Measurement of Taper Pipe Taps, Reaming Data and Tap Drill Sizes

SIZE	PROTECTION				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
	NPT & NPTF		SAE-SHORT							
	MIN.	MAX.	MIN.	MAX.						
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

S C R E W S I Z E S											
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 does 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

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

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

TABLE
329

SIZE	THREADS PER INCH			MAJOR DIAMETER						BASIC PITCH DIA.	PITCH DIAMETER LIMITS							
	NC AND UNC	NC AND UNF	NS	GROUND THREAD			CUT THREAD				GROUND THREAD				CUT THD.			
				BASIC	MIN.	MAX.	MIN.	MAX.	MIN.		MAX.	H1 LIMIT	H2 LIMIT	H3 LIMIT	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

SIZE	THREADS PER INCH				MAJOR DIAMETER					PITCH DIAMETER LIMITS																		
	NC AND UNC	NF AND UNF	NS	UNC	GROUND THREAD					GROUND THREAD																		
					BASIC	MIN.	MAX.	MIN.	MAX.	L1 LIMIT		H1 LIMIT		H2 LIMIT		H3 LIMIT		H4 LIMIT		H5 LIMIT		H6 LIMIT		H8 LIMIT		CUT THD.		
										MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.		MIN.	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	1.0162	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	****	****	****	****	****	****	1.1548	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.	TAP SIZE	TAP DRILL SIZE	DECIMAL EQUIV. OF TAP DRILL (INCHES)	PROBABLE PERCENT OF THREAD ENGMT.	TAP SIZE	TAP DRILL SIZE	DECIMAL EQUIV. OF TAP DRILL (INCHES)	PROBABLE PERCENT OF THREAD ENGMT.
0-80	56	.0465	74	10-32	5/32	.1563	78	5/8-18	9/16	.2525	82
	3/64	.0469	72		22	.1570	77		14.5mm	.5709	70
	1.25mm	.0492	57		21	.1590	72		37/64	.5781	60
1-64	54	.0550	81	12-24	11/64	.1719	78	3/4-10	41/64	.6406	81
	1.45mm	.0571	71		17	.1730	76		21/32	.6563	69
	53	.0595	59		16	.1770	68		17.0mm	.6693	59
1-72	1.5mm	.0591	69	12-28	16	.1770	80	3/4-16	11/16	.6875	72
	53	.0595	66		15	.1800	73		17.5mm	.6890	70
	1.55mm	.0610	58		14	.1820	69		17.7mm	.6969	60
2-56	51	.0670	75	1/4-20	9	.1960	80	7/8-9	49/64	.7656	73
	1.75mm	.0689	67		7	.2010	72		19.7mm	.7756	66
	50	.0700	62		13/64	.2031	69		25/32	.7813	62
2-64	50	.0700	71	1/4-28	5.4mm	.2126	76	7/8-14	51/64	.7969	79
	1.8mm	.0709	67		3	.2130	75		20.5mm	.8071	68
	49	.0730	56		5.5mm	.2165	67		13/16	.8125	62
3-48	48	.0760	79	5/16-18	F	.2570	74	1-8	55/64	.8594	84
	5/64	.0781	71		6.6mm	.2598	70		7/8	.875	74
	46	.0810	60		G	.2610	68		57/64	.8906	64
3-56	46	.0810	71	5/16-24	H	.2660	82	1-12	29/32	.9063	82
	45	.0820	66		6.8mm	.2677	78		59/64	.9219	68
	2.1mm	.0827	63		I	.2720	70		23.5mm	.9252	65
4-40	44	.0860	75	3/8-16	7.8mm	.3071	81	1-14	59/64	.9219	79
	43	.0890	66		5/16	.3125	74		23.5mm	.9252	75
	2.3mm	.0906	61		0	.3160	69		15/16	.9375	62
4-48	2.3mm	.0906	73	3/8-24	8.4mm	.3307	77	1-1/8-7	31/32	.9688	81
	42	.0935	62		Q	.3320	75		63/64	.9844	73
	2.4mm	.0945	58		8.5mm	.3346	70		1	1.0000	65
5-40	39	.0995	73	7/16-14	23/64	.3594	81	1-1/8-12	1-1/32	1.0313	82
	38	.1015	67		9.3mm	.3661	74		26.4mm	1.0394	74
	2.6mm	.1024	64		9.4mm	.3701	70		1-3/64	1.0469	67
5-44	38	.1015	74	7/16-20	W	.3860	75	1-1/4-7	1-3/32	1.0938	81
	2.6mm	.1024	71		25/64	.3906	68		1-7/64	1.1094	73
	37	.1040	65		10.0mm	.3937	63		1-1/8	1.1250	64
6-32	36	.1065	73	1/2-13	10.5mm	.4134	84	1-1/4-12	1-5/32	1.1563	81
	7/64	.1095	66		27/64	.4219	75		29.5mm	1.1614	76
	34	.1110	62		11.0mm	.4331	64		1-11/64	1.1719	67
6-40	33	.1130	72	1/2-20	11.4mm	.4488	74	1-3/8-6	1-13/64	1.2031	77
	2.9mm	.1142	68		29/64	.4531	67		1-7/32	1.2188	69
	32	.1160	62		11.6mm	.4567	62		1-15/64	1.2344	62
8-32	3.4mm	.1339	70	9/16-12	15/32	.4688	84	1-3/8-12	1-9/32	1.2813	81
	29	.1360	64		31/64	.4844	69		1-19/64	1.2969	66
	3.5mm	.1378	60		12.5mm	.4921	62		33.0mm	1.2992	64
8-36	29	.1360	72	9/16-18	1/2	.5000	82	1-1/2-6	1-21/64	1.3281	76
	3.5mm	.1378	67		13.0mm	.5118	66		1-11/32	1.3438	69
	9/64	.1406	60		33/64	.5156	60		1-23/64	1.3594	62
10-24	3.7mm	.1457	78	5/8-11	17/32	.5313	76	1-1/2-12	1-13/32	1.4063	80
	25	.1495	71		13.7mm	.5394	70		1-27/64	1.4219	66
	24	.1520	67		35/64	.5469	63				

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

Tap Drill Sizes for
Screw Thread Inserts

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

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

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

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

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				SURFACE TREATMENT OR COATING
	7 OR LESS	8-15	16-24	OVER 24	
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

$$\text{RPM} = (3.82 \times \text{FPM}) / \text{DIA.}$$

$$\text{FPM} = (\text{RPM} \times \text{DIA.}) / 3.82$$

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 US

BRUBAKER TOOL
200 FRONT STREET
MILLERSBURG, PA 17061

717-692-2113

Fax 717-692-4995

Toll Free 800-522-8665

Customer Service 800-522-8665

Technical Support 800-522-8665

www.brubakertool.com

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



200 Front Street • Millersburg, PA 17061

800-522-8665 • brubakertool.com

©2006 Dauphin Precision Tool, LLC

ISO 9001 Certified



PART NUMBER

NOTE(S)
1) N
2)



ETCHING:

+ .0000
- .0015
.4800
SHANK
DIAMETER

MENT: 64.0 ±1.0 Rc

SURFACE TREATMENT:
MATERIAL TO BE TAPPED:
BLANK NUMBER: 62H+005M1



62-23002 05/06

DRAWN BY: TLS