

# PIPE THREADS — ANSI/ASME B1.20.1 (NPT/API)

**BASIC DIMENSIONS OF AMERICAN NATIONAL STANDARD TAPER THREADS, NPT (ANSI/ASME B1.20.1)**

NPS	Number of threads per inch	Pitch of thread		Depth of thread		Truncation, max."		Pitch diameter at plane of hand-tight engagement		Length from end of pipe to plane of hand-tight engagement		Length of useful thread		Length of vanish (or washout) thread	
		P		h		I		E		L1		L2		L2	
		in	mm	in	mm	in	mm	in	mm	in	Threads	in	Threads	in	Threads
1/8"	27	0.03704	0.941	0.02963	0.753	0.00360	0.091	0.37360	9.489	0.162	4.36	0.2639	7.12	0.1285	3.47
1/4"	18	0.05556	1.411	0.04444	1.129	0.00490	0.124	0.49163	12.487	0.228	4.10	0.4018	7.23	0.1928	3.47
3/8"	18	0.05556	1.411	0.04444	1.129	0.00490	0.124	0.62701	15.926	0.240	4.32	0.0478	7.34	0.1928	3.47
1/2"	14	0.07143	1.814	0.05714	1.451	0.00560	0.142	0.77843	19.772	0.320	4.48	0.5337	7.47	0.2478	3.47
3/4"	14	0.07143	1.814	0.05714	1.451	0.00560	0.142	0.98887	25.117	0.339	4.75	0.5457	7.64	0.2478	3.47
1"	11.5	0.08696	2.209	0.06957	1.767	0.00630	0.160	1.23863	31.461	0.400	4.60	0.6828	7.85	0.3017	3.47
1-1/4"	11.5	0.08696	2.209	0.06957	1.767	0.00630	0.160	1.58338	40.218	0.420	4.83	0.7068	8.13	0.3017	3.47
1-1/2"	11.5	0.08696	2.209	0.06957	1.767	0.00630	0.160	1.82234	46.287	0.402	4.83	0.7235	8.32	0.3017	3.47
2"	11.5	0.08696	2.209	0.06957	1.767	0.00630	0.160	2.29627	58.325	0.436	5.01	0.7565	8.70	0.3017	3.47
2-1/2"	8	0.12500	3.175	0.10000	2.540	0.00780	0.198	2.76215	70.159	0.682	5.46	1.1375	9.10	0.4337	3.47
3"	8	0.12500	3.175	0.10000	2.540	0.00780	0.198	3.38850	86.068	0.766	6.13	1.2000	9.60	0.4337	3.47
3-1/2"	8	0.12500	3.175	0.10000	2.540	0.00780	0.198	3.88881	98.776	0.821	6.57	1.2500	10.00	0.4337	3.47
4"	8	0.12500	3.175	0.10000	2.540	0.00780	0.198	4.38712	111.433	0.844	6.75	1.3000	10.40	0.4337	3.47
5"	8	0.12500	3.175	0.10000	2.540	0.00780	0.198	5.44929	138.412	0.937	7.50	1.4063	11.25	0.4337	3.47
6"	8	0.12500	3.175	0.10000	2.540	0.00780	0.198	6.50597	165.252	0.958	7.66	1.5125	12.10	0.4337	3.47
8"	8	0.12500	3.175	0.10000	2.540	0.00780	0.198	8.50003	215.901	1.630	8.50	1.7125	13.70	0.4337	3.47
10"	8	0.12500	3.175	0.10000	2.540	0.00780	0.198	10.62094	296.772	1.210	9.58	1.9250	15.40	0.4337	3.47
12"	8	0.12500	3.175	0.10000	2.540	0.00780	0.198	12.61781	320.493	1.360	10.88	2.1250	17.00	0.4337	3.47
14"	8	0.12500	3.175	0.10000	2.540	0.00780	0.198	13.87262	352.365	1.562	12.50	2.2500	18.00	0.4337	3.47
16"	8	0.12500	3.175	0.10000	2.540	0.00780	0.198	15.87575	403.244	1.812	14.50	2.4500	19.60	0.4337	3.47
18"	8	0.12500	3.175	0.10000	2.540	0.00780	0.198	17.87500	454.025	2.000	16.00	2.6500	21.20	0.4337	3.47
20"	8	0.12500	3.175	0.10000	2.540	0.00780	0.198	19.87031	504.706	2.125	17.00	2.8500	22.80	0.4337	3.47
24"	8	0.12500	3.175	0.10000	2.540	0.00780	0.198	23.68094	606.066	2.375	19.00	3.2500	26.00	0.4337	3.47

E = Pitch diameter at hand-tight plane. This is also the pitch diameter at the gauge plane.

L<sub>1</sub> = Length of normal hand-tight engagement. This is also the L1 gauge length. (Longer thread engagement may be used in special applications, such as flanges for high pressure use. In such cases the pitch diameter, E, remains as specified and the diameter at the end of the pipe is proportionally smaller.)

L<sub>2</sub> = Effective length of thread

= Truncation from point of thread triangle to flat (not shown in diagram). Minimum = 0.033P for all pitches. See table for maximum.

**Example designation:**

3/8 – 18 NPT

where

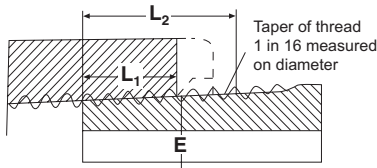
3/8 = nominal pipe size

18 = number of threads per inch

NPT = symbol for the thread series and form (i.e., National (American) Standard Pipe, Taper)

**Tolerances**

When using L1 gauges to check threads, the thread is within permissible tolerance if the ring gauge face, or plug gauge notch, is +/- 1 turn from being flush with the end of the thread.



**Note** – Basic dimensions are given to four or five decimal places to eliminate errors when calculating gauge dimensions, they do not imply a greater degree of precision than is normally obtainable.

– Metric dimensions, where shown, are calculated from the inch values and rounded.