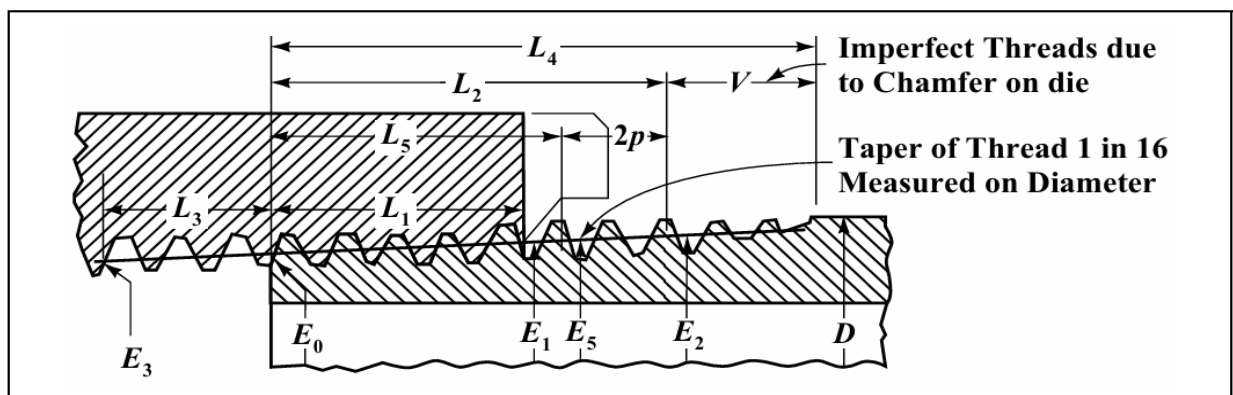


NPT Tapping Info and Guide

Here is a reference guide I put together with all the required information for tapping an NPT thread.

Table 4. Basic Dimensions, American National Standard Taper Pipe Threads, NPT
ANSI/ASME B1.20.1-1983 (R1992)



Some information on tapping NPT threads.

L_1 = hand tightening length

L_3 = Wrenching Engagement length

L_4 = Full length of thread

A general rule is that it will take 3 to 5 turns before the thread is hand tight and then a further 1 to 3 turns to be "Air Tight". Air tight is between L_1 and L_3 , tightening the thread past L_3 is not in specification.

The depth at which to tap can be approximated by L_4 , however NPT is a gauge type thread, so caution should be used on the first hole.

Here is a table I put together with the relevant information required to tap a hole.

NPT Tapping										
Pipe Size	Pipe Dia	L4-Full Length	L1-Hand Tight	L1-Turns	TPI	Pitch	L3-Wrench	L1+L3	Drill Tap	Drill Tap
1/16"	0.3125	0.3896	0.16	4.32	27	0.037	0.111	0.271	D	0.246
1/8"	0.405	0.3924	0.1615	4.36	27	0.037	0.111	0.273	Q	0.332
1/4"	0.54	0.5946	0.2278	4.10	18	0.056	0.167	0.395	7/16"	0.4375
3/8"	0.675	0.6006	0.24	4.32	18	0.056	0.167	0.407	9/16"	0.5625
1/2"	0.84	0.7815	0.32	4.48	14	0.071	0.214	0.534	45/64"	0.7031
3/4"	1.05	0.7935	0.339	4.75	14	0.071	0.214	0.553	29/32"	0.7813
1"	1.315	0.9845	0.4	4.60	11.5	0.087	0.261	0.661	1 9/64"	1.1406
1.25"	1.66	1.0085	0.42	4.83	11.5	0.087	0.261	0.681	1 31/64"	1.484
1.5"	1.9	1.0252	0.42	4.83	11.5	0.087	0.261	0.681	1 47/64"	1.7344
2"	2.375	1.0582	0.436	5.01	11.5	0.087	0.261	0.697	2 13/64"	2.2031
2.5"	2.875	1.5712	0.682	5.46	8	0.125	0.250	0.932		
3"	3.5	1.6337	0.766	6.13	8	0.125	0.250	1.016		
3.5"	4	1.6837	0.821	6.57	8	0.125	0.250	1.071		
4"	4.5	1.7337	0.844	6.75	8	0.125	0.250	1.094		
5"	5.563	1.84	0.937	7.50	8	0.125	0.250	1.187		
6"	6.625	1.9462	0.958	7.66	8	0.125	0.250	1.208		

Some general rules to successfully NPT tap a hole.

Firstly, tapping a tapered hole is a tough as it gets on the tool itself due to the amount of engagement. To increase success it is suggested to use a pipe reamer with a very heavy speciality tapping lubricant. For every full turn in there must be half a turn back in order to break chips and stop the flutes from clogging.

Using a countersink on the hole to help better guide the tap will aid in success. The most important thing is to have the tap perfectly straight. Using a drill press or a lathe with a centre for manual tapping is a must.

For the best success ditch the tap and go with a thread mill, assuming CNC capabilities.

Check out my other guides for general information.