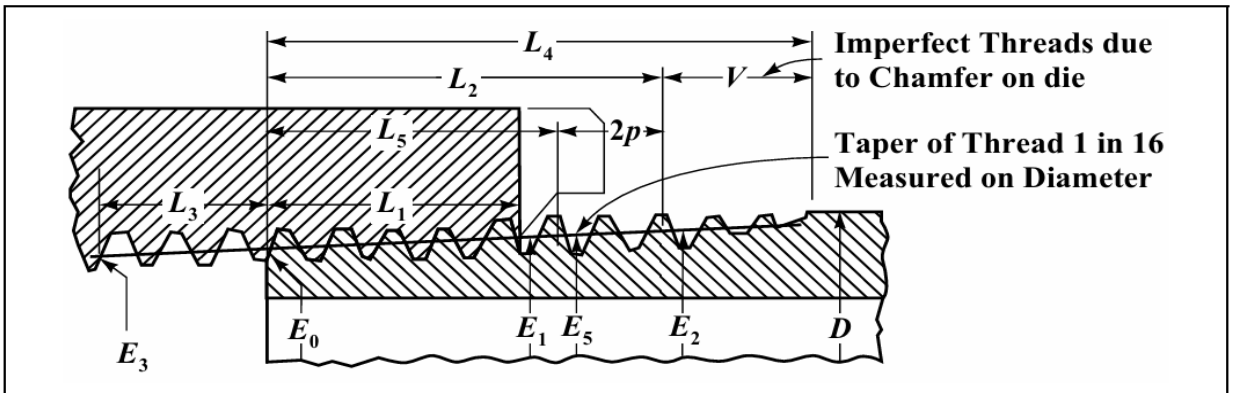
NPT Tapping Info and Guide

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.

L1 = hand tightening length

L3 = Wrenching Engagement length

L4 = 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 L1 and L3, tightening the thread past L3 is not in specification.

The depth at which to tap can be approximated by L4, 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"	0.9063
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.