

DiyVT's Omnium Gatherum

U.S. Threads with Tapping & Clearance Drills

Thread	Tap Drill	Clearance Drill
0000-160	78	73
000-120	71	63
00-90	62	55
1-56	54	48
1-64, 1-72	53	48
2-56, 2-64	50	43
3-48	47	38
3-56	45	38
4-32	45	33
4-36	44	33
4-40	43	33
4-48	42	33
5-44	37	30
6-32	36	28
6-36	34	28
6-40	33	28
8-32, 8-36	29	19
8-40	28	19
10-24	25	10
10-32	21	10
12-24	16	2
12-28	14	2
12-32	13	2
14-20	7	G
14-28	3	G
5/16-18	F	P
5/16-24	I	P
3/8-16	5/16	W
3/8-24	Q	W
7/16-14	U	29/64
7/16-20	25/64	29/64
1/2-13	27/64	33/64
1/2-20	29/64	33/64
9/16-12	31/64	37/64
9/16-18	33/64	37/64
5/8-11	17/32	41/64
5/8-18	37/64	41/64
11/16-11	19/32	45/64
11/16-16	5/8	45/64
3/4-10	21/32	49/64
3/4-16	11/16	49/64
7/8-9	49/64	57/64
7/8-14	13/16	57/64
1-8	7/8	1-1/32
1-12, 1-14	15/16	1-1/32

In every tool there's a hammer. Perfect is the enemy of done.

- Tom Sachs's Ten Bullies
1. Work to code (work within the system)
 2. Sacred Space (the studio is sacred)
 3. Be on Time
 4. Be Thorough
 5. I Understand (give/get feedback)
 6. Saint Does Not Mean Received (confirm)
 7. Keep a List
 8. Always Be Knolling
 9. Sacrifice to Leather face (own mistakes)
 10. Remember to Give a Shout to Adam Savage!

U.S. Pipe Thread

Thread	Drill
1/8-27	R
1/4-18	7/16
3/8-18	37/64
1/2-14	23/32
3/4-14	59/64
1-11 1/2	1-5/32
1 1/4 - 11 1/2	1 1/2
1 1/2 - 11 1/2	1 7/64
2 - 11 1/2	2 7/32
2 1/2 - 8	2 5/8
3 - 8	3 1/4
3 1/2 - 8	3 3/4
4 - 8	4 1/4

Calculating the Diameter of a U.S. Number-Screw: Pitch makes no difference in diameter; all No. 8 screws are the same diameter.

The formula is: $O.D. = .060" + (N \times .013")$, where N is the number size of the screw.

Thus, the diameter of a No. 8 screw is: $.060" + (.013" \times 8) = .104"$

The diameter of a No. 6 screw is: $.060" + (.013" \times 6) = .098"$

For 00, 000, and 0000 screws each zero more than counts, in N as a minus one in the formula.

Thus, the diameter of a No. 00 screw is: $.060" - (.013" \times 2) = .034"$

And, the diameter of a No. 000 is: $.060" - (.013" \times 3) = .027"$

Getting small, the diameter of a No. 0000 screw is: $.060" - (.013" \times 4) = .020"$

If you will study the information above, you will discover three handy accidents: No. 0 screw threads go nicely on 1/16" diameter rod. No. 5 screw threads go nicely on 1/8" diameter rod. No. 10 screw threads go nicely on 3/16" diameter rod.

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Tap Drills & Inch Equivalents	Metric Threads with Thread	Material	Cutter
M1.6 x 0.35	1.25 .0492	Mild Steel	HSS 100 300
M1.8 x 0.35	1.45 .0571	Annealed HC Steel	80 200
M2.2 x 0.4	1.6 .0630	Aluminum	300 850
M2.5 x 0.45	2.05 .0807	Brass	175 500
M3 x 0.5	2.5 .0984	Cast Iron	100 250
M3.5 x 0.6	2.9 .1142	Annealed SS	90 225
M4 x 0.7	3.3 .1299		Cutting Speed SFM
M4.5 x 0.75	3.7 .1457		
M5 x 0.8	4.2 .1654		
M6 x 1	5.0 .1969		
M7 x 1	6.0 .2362		
M8 x 1.25	6.7 .2638		
M8 x 1	7.0 .2756		
M10 x 1.5	8.5 .3346		
M10 x 1.25	8.7 .3425		
M12 x 1.75	10.2 .4016		
M12 x 1.25	10.8 .4528		
M14 x 2	12.0 .4724		
M16 x 2	14.0 .5512		
M16 x 1.5	14.5 .5709		
M18 x 2.5	15.5 .6102		
M18 x 1.5	16.5 .6496		
M20 x 2.5	17.5 .6890		
M20 x 1.5	18.5 .7283		
M22 x 2.5	19.5 .7677		
M22 x 1.5	20.5 .8071		

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If you leave the key in place in the Jacobs driver's drill press, you are dangerously ally, but if you leave the wrench in the chuck of your lathe, you are feloniously negligent, and ought to spend the night in jail. If the lathe is started incidentally, it will injure the chuck, the chuck wrench, the bedways of the lathe, and, with luck, no-body but you. This is called the Grand Slam of negligence.

Any one in this shop found using compressed air in boreplay will be fired instantly, without discussion, and will wait for their check out in the parking lot.

One signal that you are doing your job right is that the chips in the pan under your lathe are razor sharp. Never clean any of this away while your lathe is running, use paper towels to protect your hands. If the stuff is stringy and inter-coiled, use a hook with a hand on it to pull it out.

Never confuse Tight with Dry

When very fine cuts need to be made on a lathe, set your compound to 6 degrees. Moving the compound in 0.001 will move the cutter in 0.0001.

This chart was created by Eric Matt, diyVT on YouTube, diy-Vermon@gmail.com

Many of the sayings and information here was copied from The Chester River Machine Tool Company's Omnium Gatherum.

1. Do the easiest thing first
2. Don't rely on the people that tried and failed prior
3. 90% of problems are between the driver's seat and the steering wheel

Bonus: If it can go wrong, it WILL go wrong. (Murphy's Law) (AVE)

Never wear gloves when using machine tools. If one catches in something, it generally takes some hand with it as it generally takes.

Good machinist make very few mistakes. The best machinists seem to make none at all, because they are quiet about retrieval and salvage, and are true about it.

If you use a machinist in a hurry he just makes a mistake or is about to.

Skilled labor isn't cheap, cheap labor isn't skilled.

Don't work to tolerance that arm's there.

Commitment is what transforms a promise into reality. It is the words that speak boldly of your intentions. And the actions which speak louder than the words.

It is reported on the best authority that a very painful way to implicate a finger is to stick it in the spindle rotor of the lathe or miling machine before the machine has stopped.

It's physics, math and engineering. machine it, draft it, built it, test it, break it, every time some new gets the entire world advances.

Mike Pacey

Past, Cheap, Good (Pick 2)

