

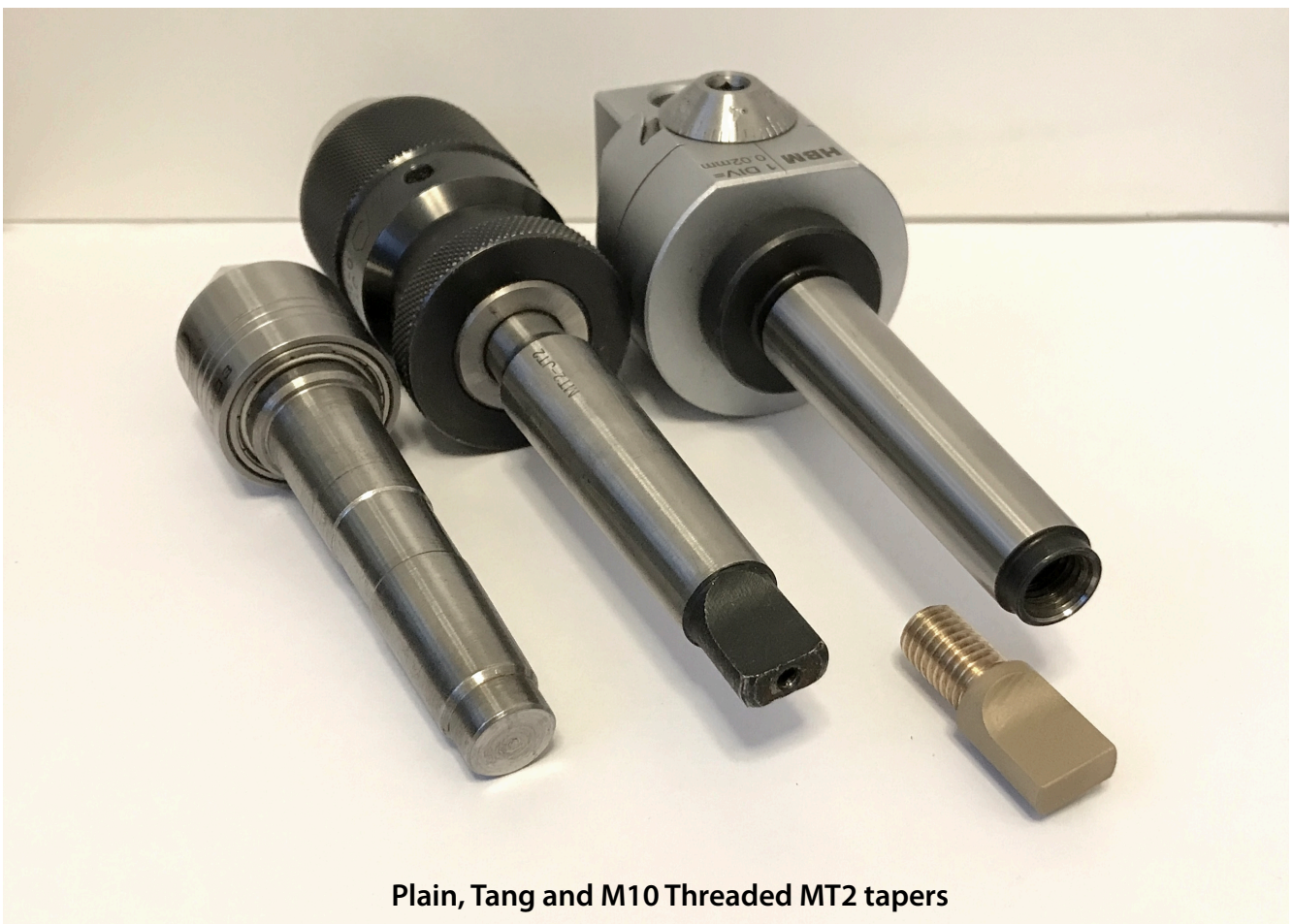
Machine tapers, what you need to know

There are several types of machine tapers but the two most common ones that woodturners are likely to come across are the Morse taper and Jacobs taper. Most wood turning lathes have a Morse taper two (MT2) in both the head stock spindle and tailstock barrel. This is the long taper most are familiar with on things like spur drives and centres etc. If you have a drill chuck for your lathe though you may be unaware that the chuck body is *often fitted to the arbor with a much shorter "Jacobs" taper.

It's very important to know that neither of these tapers were designed to take side loads. Machinists are aware of this and only subject Morse taper tooling to side loads if a draw bar is fitted. There is no provision for securing a Jacobs taper. With this in mind, whilst it's perfectly

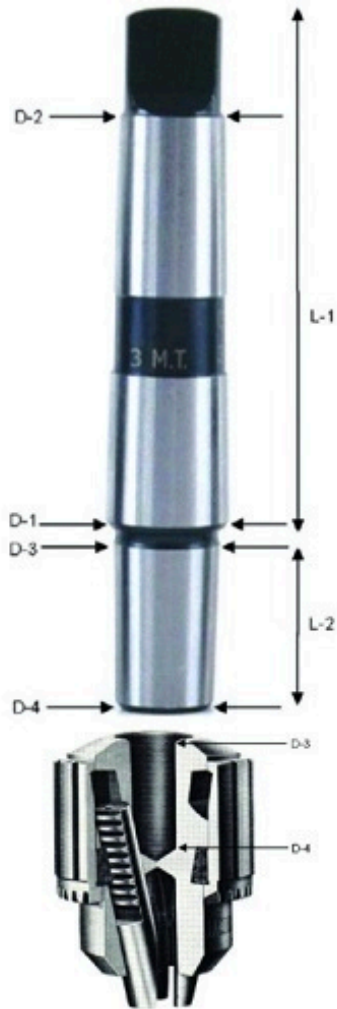
acceptable to fit a drill chuck in your head stock for drilling it should not be used for any type of work holding etc, if side loads are to be applied.

A much safer alternative is a collet Chuck, secured with a draw bar. Taper tooling very rarely comes with a draw bar but you can easily fabricate one yourself from threaded rod and a nut and washer. The most common thread used on MT2 tapers is M10 but unfortunately 3/8" Whitworth is also not uncommon so be aware of this. Drill chucks are often supplied with an arbor fitted. If you should acquire a chuck without one check carefully which taper it requires. As mentioned earlier many have a Jacobs taper but chucks with metric "B" tapers are not uncommon. Both types of tapers are available in a range of different sizes. See chart below.



Plain, Tang and M10 Threaded MT2 tapers

Morse taper arbors come in three types. Plain, threaded or with a tang. Drill chuck arbors normally have a tang to eject it from the tailstock. Drive centres normally have a plain end and will require a knock out rod to remove them. Other Morse taper tooling such as collet chucks or cutters etc may have an internal thread for use with a draw bar to secure them in the head stock spindle. Sometimes it can be handy to use taper tooling in both the head stock and tailstock and rather than exchanging the arbor you can fit a screw in tang (pictured) to a threaded arbor to facilitate this.



MORSE TAPERS

Morse			
Taper No.	D-1 mm	D-2 mm	L-1 mm
1	12.065	9.70	65.5
2	17.780	14.90	80
3	23.825	20.20	99
4	31.267	26.50	124
5	44.399	38.20	156
6	63.348	54.60	218

JACOBS TAPERS

Jacobs			
Taper No.	D-3 mm	D-4 mm	L-2 mm
0	6.350	5.802	11.112
1	9.754	8.469	16.669
2 short	13.940	12.386	19.050
2	14.199	12.386	22.225
33	15.850	14.237	25.400
6	17.170	15.582	25.400
3	20.599	18.951	30.956
4	28.550	26.346	42.069
5	35.890	33.422	47.625

DIN (METRIC) TAPERS

DIN			
Taper No.	D-3 mm	D-4 mm	L-2 mm
B10	10.094	9.40	14.50
B12	12.065	11.10	18.50
B16	15.733	14.50	24.00
B18	17.780	16.20	32.00
B22	21.793	19.80	40.50
B24	23.825	21.30	50.50

*Although perhaps less common for machine tools, some drill chucks are threaded, but can still be fitted to a Morse taper arbor. See below. If you must use a drill chuck in the head stock spindle this is probably a much safer option, but once again choose a threaded arbor and use a draw bar.



1 – 13mm Drill Chuck with 1/2 x 20 UNF Thread

£12.50- (£15.00 inc VAT.)

1- 13 MM Capacity Quality Drill Chuck with 1/2 x 20 Thread

Complete with key

CLICK THE IMAGE ON THE LEFT FOR A LARGER PICTURE

