

On most small woodturning lathes, the chuck is fitted to the mandrel with a screw thread. The thread holds the chuck in place, and keeps it central. The shoulder behind the thread is a register face which keeps the chuck pointing in the right direction. It's essential that this face, and the back of the chuck, are clean and undamaged. A tiny error here will make the work run well out of true. If the nose thread is too long for the hole in the chuck, you can add a turned metal washer, but it must be an even thickness.

Most woodturners already have chucks and faceplates for their plain lathe. You need to be able to swap work from one machine to another, so it makes sense to use the same nose thread on a rose engine.

If you're not already committed to a thread size, think about using  $\frac{3}{4}$  inch 16 tpi. Provided you're working on a smallish scale (say 6" to 8" max diameter), there are many advantages. Woodturning chucks are often not ideal for complex work. They tend to be big and heavy, and they're often not terribly accurate.

There are lots of chucks available for  $\frac{3}{4}$ " 16 tpi : I find a  $\frac{3}{4}$ " Jacobs chuck very useful, or a small collet chuck would do similar small accurate work. Because Peatol (Taig) and Sherline lathes have the same nose thread, their chucks and accessories will fit. I'm keen on Peatol chucks, very neat, accurate and cheap. The self-centring soft-jaw chucks are easy to machine. I use one with very shallow steps to hold perspex discs.

You can buy small chuck backplates, with a  $\frac{3}{4}$ " 16 thread tapped in the hole (Arc Euro). It's not difficult cutting the register on a backplate with handtools on a plain lathe, apart from one little detail. The backplates from Arc Euro are soft and easy to cut near the edge. I was surprised when the tool stopped cutting, and I found it's sharp edge had vanished. I reground it, and the same thing happened again. Eventually I realised the steel was very hard near the line of the lateral register. I ground a 3 faceted point tool from 1/8" carbide, put a 1/8" hole and a grubscrew in a chunky steel rod, and added a long handle. The hardened steel didn't stand a chance.

Lathes.co.uk describes how to fit a chuck to a backplate. It's the same process using hand or sliderest tools. They don't mention that you can make a chuck adjustable, by cutting the register slightly undersize, and drilling the bolt holes slightly oversize. Using a dial gauge, adjust the position of the chuck till the work runs true, then do the bolts up tight. This arrangement is fine for the sort of forces involved in decorative work, though it probably wouldn't survive heavy intermittent cuts on metal.

A couple of years ago, I was able to buy a spare mandrel for my old Carbatec lathe. It's a convenient size to fit the 5c spin indexer (20mm collet), and was quite cheap. I suspect a mandrel for a cheap Record lathe would do equally well, or you could make your own thread adaptor.  $\frac{3}{4}$  16 is a UNF thread. You can buy nuts and bolts, very useful for making up odd jigs or chucking arrangements. It's easy for an engineer to cut the thread on a piece of metal, but someone with no metalworking experience may find chopping the end off a bolt demanding enough. Warning – Large bolts are usually made of very tough steel. Often, it's not fun to turn by hand.

Fred Armbruster has fitted his new Rose Engines with 5c collets. He suggests gripping the work direct in the collet to minimise overhang, but you can also grip an adaptor to suit a chuck. It astonishes me that I'd had a 5c indexer for ages, but I hadn't tried gripping work in the collet. It works beautifully. The only minor problem is cutting an accurate spigot on the wood, but it doesn't have to be as accurate as a suction-fit box lid. You waste 10mm of wood in cutting a spigot, then removing it, only really relevant in rare exotics. You could glue a spigot to the work if it really matters.

If you're phasing cuts by rotating the work in the chuck, a 5c is very good for maintaining concentricity, (but you can't line the work up to jaw 1 of the chuck).

It's a pity 5c fixtures are so large. An eccentric chuck's certainly impossible, but I wonder if you could use one for a dome chuck. It would be clumsy, but it could be interesting.