

Making pens from scratch – part 1

In the first part of a new project, **Walter Hall** turns the core section of a fountain pen

Not even the most dedicated of pen turners could argue that making simple pens from kits is the most challenging aspect of the hobby of woodturning. In previous articles in this series I have looked at several ways in which the developing maker might seek out more challenging methods and techniques for working with kits or making their own blanks. Eventually, however, the more adventurous amongst pen makers will seek out the ultimate challenge of making pens from scratch, using only basic components such as nibs and feed mechanisms for fountain pens and refills and click or twist mechanisms for ballpoints.

Over the next few articles I shall be making some pens from scratch, starting this month with the core of a fountain pen, usually known as the 'section'. This is the part of the pen that holds the nib and the ink feed or cartridge together and is threaded to fit into the body of the pen. I made this one, for reasons I shall explain later, from aluminium. Next month I shall complete the pen by making the body (barrel) and cap.

I should explain at the outset that I am not an expert in making pens from scratch,

and I shall be sharing my learning process and disasters with you along with my successes. Those with more experience of making pens from scratch or anyone with ideas or techniques is welcome to contact me with suggestions. I will be happy to incorporate or share them as appropriate in future articles.

Making the 'section'

The principle skills involved in making this part of the pen are rather more akin to precision engineering than woodturning. Accurate measurement, careful drilling and tapping and the cutting of external threads with dies are at the core of the process. Some specialist tools will be needed – principally correct sized drills, fine taps and dies and the means to use them on or off the lathe. Finding some of the more specialist taps and dies in the UK can be a challenge, I had to import some of the ones I used from the USA where they are more readily available.

A tailstock mounted die holder is also essential to ensure that externally threaded components have threads that are straight and true to the axis of the component.

Choosing an appropriate material for the section is also vital. The research I have done suggests that one of the best materials for making the section of a pen is ebonite, which

is a kind of hard rubber. Other suitable options are alumilite resin or soft metals such as aluminium or brass. Most polyester resins, as I found from experience, are too brittle for the making of such delicate parts. I shall conduct more experiments with other materials later and am happy to receive suggestions.

The choice of nib, feed and ink converter will determine the dimensions and tap sizes required. I used a 5mm Bock nib unit from Beaufort Ink who also supplied the ink converter and the appropriate tap for the feed. This, and the availability of suitable taps and dies led me to decide on 8.5mm x 0.75 threads for the section to barrel connection and a triple start 11mm thread for the cap to barrel, which will be used in the next article. These latter taps and dies all had to be imported. You may wish to try the more affordable and easily obtainable standard metric fine threads until you see if pen making from scratch is for you.

WALTER HALL



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I imported some specialist taps and dies from the USA



A tailstock mounted die holder is essential



The nib unit came from Beaufort Ink

EQUIPMENT USED

- TCT cutting tool – or beading & parting tool/HSS scraper
- Centre drill
- Thread-cutting lubricant
- Parting tool
- Hacksaw
- Tap holder
- Abra-net and Micro-Mesh abrasives
- Farecla polishing compounds

MATERIAL REQUIREMENTS

- Ebonite, alumilite resin, aluminium or brass for the section
- Nib unit, feed and ink converter

1 For this project I used some leftover aluminium rod and pressed it into service. I mounted a short length of the rod in a scroll chuck fitted with small dovetail jaws

2 I used a tungsten-carbide tipped tool to cut a tenon for the 8.5mm section to barrel thread, measuring carefully to ensure the correct dimensions

3 The next step was to drill out the bore for the ink converter. This needs to be a good close fit so accurate drilling is of paramount importance. I used a centre drill to create a pilot hole, this helps to ensure that any subsequent drilling is centred and true. A set of centre drills is not expensive and you will find them very useful

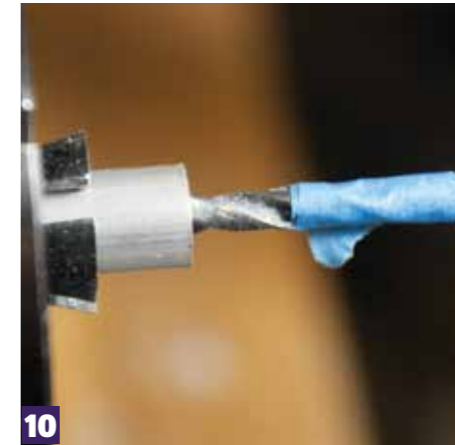
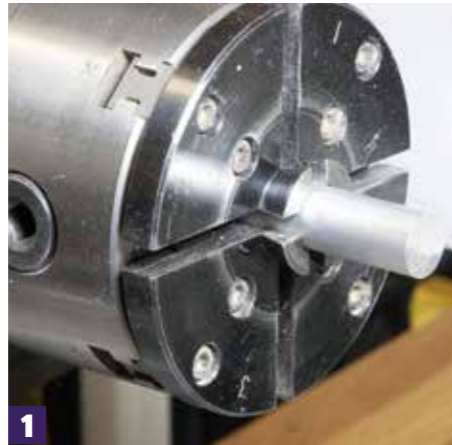
4 I then measured the diameter of the ink converter, mine was 6.35mm (1/4in) so I drilled out to just under size at 6.3mm and then used an imperial 1/4in drill to achieve an exact fit. I cannot stress enough that the fit of the converter is one of the keys to success in this project. A sloppy fit will result in disastrous ink leakages

5 Once the converter was a good fit I began the process of cutting the threads on the tenon. With the die mounted in the tailstock die holder and having applied a spray of thread-cutting lubricant, I turned the die and workpiece against one another by hand, slowly and carefully cutting and backing off to clear swarf

6 To finalise the thread up to the section body I reversed the die in the holder so the flat face was facing the work

7 Using a parting tool I then cut a recess at the rear of the thread so that when the body of the pen is attached it will fit snugly and flush to the section with no unsightly gaps

8 An important factor in achieving a good fit and a working section is careful measurement of the length required to fit the nib and feed. I assembled the components and measured with a steel rule. My measurements were accurate enough but Vernier callipers would perhaps be a better alternative



9 I transferred the measurements to the component and then cut to length with a hacksaw taking care to achieve a straight cut and leaving a small amount of material to be squared off on the lathe. If you're using softer material such as ebonite, the parting off could be done on the lathe with a thin parting tool

10 With the section component reversed in the chuck and having once again prepared a starter hole with a centre drill, I drilled out first to the appropriate diameter for the tap that will cut the thread for the feed – check with the nib or tap manufacturer for the correct size for your nib – and then to size and appropriate depth for the body of the feed and a few millimetres for the collar of the feed. The exact dimensions will be determined by the sizes of your chosen components. I used tape to mark the drill and gauge the depth

11 In the absence of any more sophisticated technology I tapped the internal thread by hand using my old but trusty Moore & Wright tap holder. This produced a good result but I am sure there must be better ways of doing this, although so far my research has drawn a blank. Mounting in a tailstock chuck would be one option. Once again, suggestions are welcome

12 At this point I assembled the components and tested to see that everything worked according to plan. Once I was satisfied what I had produced might actually result in a working pen, I mounted the section back in the chuck for shaping. A jam chucking arrangement seemed appropriate to prevent damage to the threads and allow access with the tools to the whole body of the component, so I drilled and tapped an offcut of acrylic material and screwed the section into it, supporting the free end with a revolving centre in the tailstock

13 Shaping was done using a round TCT cutter, carefully creating the desired shape. I created a simple straight design to suit the minimalist style of the body that will be made in the next article. Remember that the finished section must have an external diameter small enough to fit through the cap thread that you intend to use

14 The final process was to sand and polish the section. I used Abra-net and Micro-Mesh abrasives and finished with Farecla polishing compounds, but there is a wide range of suitable alternatives

15 With the nib unit screwed into place and the ink converter fitted, this stage is now complete and ready to receive the body and cap that will be the subject of next month's article

16 A final test with some ink just to make sure I have a pen and not an attractive ornament! ●