Tooling Needed to Make Pens

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For Beginners: Other Tooling Needed to Make Pens

by Dan Masshardt Created 01-17-2015

Getting Started: Other Tooling Needed to Make Pens

We are fortunate to see many new and prospective pen turners on a regular basis. That means - understandably - that the same questions come up frequently. I previously shared some advice for choosing a lathe. This article will cover some of the basic tooling required and some of the choices that you will have to make on how to go about the process. My attempt is to be fair to the options, even though I have opinions as to what I like best. Others will surely disagree and that's fine. A forum and library search will yield many discussions, reviews and opinions on each of the areas mentioned. This article is not intended to be exhaustive, only to provide a brief overview for the beginning pen turner.

Cutting Pen Blanks - Pen blanks will usually need to be cut to the correct length for each pen style. For this task you will need some kind of saw. You could use a handsaw and a miter box, a powered miter saw, a table saw sled or a bandsaw. I've found a bandsaw to be extremely valuable for many different turning tasks and would recommend that you consider purchasing one at some point. For pen blanks, a bench top model will suffice. If you intend to turn bowls as well, a 14" (or larger) floor model will come in very handy.

Drilling Pen Blanks - although it is possible to buy pre-drilled pen blanks, there are not many options available and so you will initially or eventually need to find a way to drill a hole through your pen blank to glue the brass tube in. It is possible to do this with a hand drill but this is not ideal. Getting the hole straight through and without expanding the hole will be difficult. Woodcraft sells a vice that will hold blanks to use with a hand drill, but I have not used it personally.

The traditional method for drilling pen blanks has been to use a drill press and some sort of vice to hold the blank straight. This method is still very popular and it can work very well at drilling a blank straight through accurately. The important consideration here is to either choose a drill press that has a long enough quill travel to drill your longest pen tube or plan to raise the table or but a block under to raise the blank and complete the hole. Every drill press varies but often floor standing models have more quill travel than bench top models. To hold the blank straight, many different pen blank vises are available on the market. You might also use a wooden hand screw clamp with notches cut out as a budget option.

The other popular option is to drill on the lathe. This method requires the purchase of a Jacobs chuck (drill chuck) with the appropriate Morse taper arbor for your tailstock as well as a chuck to hold your pen blank at the headstock. There is a dedicated pen blank drilling chuck available through a major supplier or you may purchase a scroll chuck with interchangeable jaws that can be used for many other turning projects such as bowls. If you choose the scroll chuck, you will need to purchase an additional set of jaws (either pin jaws or pen blank jaws). Make sure that the chuck will fit the threads on your lathe's headstock.

Some turners instead choose to round their blanks between centers and then use a collet chuck to hold the blank for drilling. This requires the purchase of both the collet chuck body appropriately threaded for your headstock threads as well as a collet set.

You will need to obtain whatever drill bits are needed for the pen kits you want to use. There is some overlap between certain styles. There are also different styles and qualities of drill bits available.

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It's best to do some additional research (and perhaps experimentation) to see which type you like best.

Squaring Pen Blanks - After the brass tube is glued in the drilled blank, some method must be used to ensure that the ends of the blank are square and flush with the brass tube. One common method to do this is with a pen mill / trimmer set. This consists of a cutter head with interchangeable shafts or adapters for each size tube. If used with the correct size shaft, this tool will clean out any glue residue that may be in the tube as well as squaring the ends. If you choose this option, you may want to purchase a small diamond hone to keep the cutter sharp. The pen mill is used in a drill or drill press.

There are other options for accomplishing this task as well. Several common methods involve using sanding methods to square the ends. You might choose to use a belt or disk sander with a jig to keep the blank properly aligned. Others use a sanding disk attached to a faceplate or arbor in the lathe's headstock along with a transfer punch set in a Jacobs chuck in the tailstock.

An additional option that adds no additional cost if you already have a chuck is to trim and square the ends of the blank on the lathe. This method involves holding the tubed blank in a chuck or collet chuck and using a skew or parting tool etc. to trim the ends flush. There are other methods as well. These seem to me to be the most common.

Mounting the Blanks on your Lathe - There are two basic options for mounting your blanks on the lathe: turning on a mandrel and turning between centers (TBC).

If you chose to use a mandrel, you will need the mandrel itself. These are available through many suppliers and you should choose one that fits your lathe's headstock Morse taper - MT1 or MT2. Alternatively, you might consider purchasing a collet chuck and using it to hold a mandrel shaft. Adjustable mandrels are a good choice with this method as they can be shortened to the ideal length for the pen you are turning. You can choose to turn one or two blanks at a time with a mandrel.

You will also need a live center for your tailstock. You can choose either a 60-degree live center that will go into the divot at the end of your mandrel shaft or you can purchase a 'mandrel saver.' This version of a live center has a hole that the mandrel shaft slides through. The advantage of the mandrel saver is that it does not put pressure on the mandrel shaft which can lead to bowing and out of round pens. Using the live center that came with your lathe is not recommended as it is not a 60-degree center.

You will need bushings for each pen style that you choose to make. They are usually available through whomever you purchase your pen components (kits).

The other popular alternative is to turn between centers (TBC). With this method you will only ever turn one blank at a time. Instead of using a mandrel, a 60-degree dead center (often used with metal lathes) is purchased to fit your lathe's headstock Morse taper (MT1 or MT2).

You will also need a 60-degree live center (the same one mentioned above).

When turning between centers, there are several methods used. It is possible to use stock bushings (except for 7mm pens) but not always advisable depending on the quality and precision of the bushings. One modification that can help is to use a center drill to put 60 degree chamfers in the stock bushings.

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Another popular option is to purchase bushings specifically designed for turning between centers. They are not as extensively available but there are a few suppliers offering them. You might also have a machinist make them for you or make them yourself if you have the necessary equipment. TBC bushings have 60 degree chamfers cut in them and often are solid in the center. Generally, the offer very good precision but add expense - especially if you are purchasing many sets.

A final option is to forgo the purchase and use of bushings and turn the pen directly on the centers. This method requires the use of a precision measuring tool such as digital calipers. This is necessary to measure the ends as one turns to ensure the correct size to match the pens components that will be pressed in.

If you choose to turn between centers, you might opt to purchase a shorter tool rest to get the rest close to the blank. With the frequently factory supplied 6" tool rest, it is difficult to get the rest close to the blank on many pen styles when turning between centers.

Turning tools - you will need at least one turning tool to round the blank and finish to size. High speed steel (HSS) tools are very common for various turning tasks. Common tools are gouges, scrapers, skews, and parting tools among others. HSS tools require sharpening, something which can be challenging (and add additional expense) for new turners. Sharpening can be done in various ways including a slow speed grinder, belt sander, other dedicated sharpening system and diamond or traditional sharpening stones / hones. Keep in mind that you will need some practice and possibly equipment for this task. This equipment can add expense, so do some additional research on systems and methods.

Although many different HSS tools can be used in pen turning, the most common seem to be the spindle gouge (of various sizes and shapes including the roughing gouge), the skew chisel (conventional and oval), the parting tool, and scrapers including tools like the Spindlemaster.

Alternatively, you might choose to purchase and use carbide insert tools. These tools have small carbide cutters - available in a few different shapes that attach to the end of a dedicated turning tool. These cutters can be turned to a fresh edge when dull and then replaced (or possibly honed for some extra life) when dull. These tools are attractive to many because sharpening skills and equipment is not required.

There is much discussion and sometimes debate about types of tools for pen turning. There are advantages and limitations to many tools and you will find experienced pen turners using a variety of tools - both HSS and carbide types.

Assembling the Pen - you will need a method to assemble the pen components into the turned and finished tubes. There are many choices for this task, some very inexpensive. You can use a vise (with something to cover the metal jaws) or a clamp to assemble the parts. There are inexpensive inserts available for purchase (or you can make) that will go into your lathe's Morse tapers to press the parts together. Some turners opt to purchase an arbor press to assemble parts. Others choose to purchase a dedicated pen press to assemble the parts.

There are, of course other supplies needed - glue or epoxy, blanks, components, sandpaper, finish, safety equipment… This article is intended to cover some of the equipment needed as well as the choices that a new pen turner has to make.

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There are lots of ways to save money. Some people stick with inexpensive options permanently while others add on over time.

There are many inexpensive options for the aspects of this process. You can use a small drill press and a handsaw and a vise or clamp. You can turn between centers without bushings. You can make your own bushings out of Delrin or Corian Etc. There are many ways to save money if you should desire.

I sharpen my skew, Spindlemaster and parting tool almost exclusively on a $10 diamond card. I built a wooden jig to hold my roughing and spindle gouges until I later got a wolverine jig.

However, I now have most of the tools that I mentioned and I can't think of any tool that I have that I regret. The only occasional regret is buying cheap versions to try to save money.

If I was a new turner today, the things I would spend money on first would be a scroll chuck with jaws, keyless drill chuck, high quality live center, carbide tip dead center and a short tool rest from Rick Herrell.

Personally, my advice is to buy some tools from a reputable supplier. Learn to sharpen and use these tools and then consider replacing them with better tools as you discover your favorites / wear down the old ones.

My primary recommendations would be an oval skew and a spindle gouge of whatever size you want. I use my 3/4" skew and 1/2" spindle gouge on just about every pen. The other tool a reach for fairly often is the Spindlemaster / versa chisel.

Have fun!

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