Tips and tricks to laser cut pen kits

Kurt Hertzog shares his suggestions for improving the process

PHOTOGRAPHS BY KURT HERTZOG

I've only met a few woodturners who haven't turned a pen or two in their journey. Some turners turn only a couple of pens while learning then move on and many turners continue to do some pens as part of their expanded repertoire. And of course, there are those who turn exclusively pens and nothing else. Regardless of the category you might align with, if you haven't tried using laser cut pen kit blanks, you've really missed an interesting opportunity. Like any turning, knowing some of the tips and tricks can help you be more successful. Let me share a few of the things I've learned on my journey that I think should help you avoid some of the pitfalls.

Read the instructions

Not to sound derogatory, but if you are like me you read the instructions to find out why you screwed up. Notice the past tense. Reading to learn why you messed things up might be informational help for the future but usually does little to remedy the current mess. I've never seen instruction sheets, whether printed or online, that are more than two pages long. Often, they are one page and that has little printing and lots of pictures. It won't take but five minutes at most to learn the potential pitfalls and avoid them. Now you have that under your belt, let's launch into the mechanics of laser cut pen blank process tips.

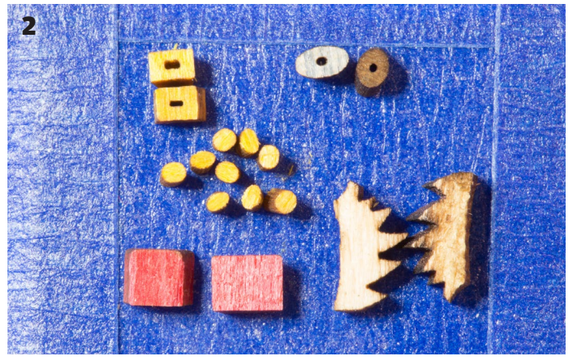
Have a clean work area for blank assembly

Depending on your kit selection, there can be a few large components to be assembled or many small, intricate pieces. Your turning area or workshop in general probably is a poor place to do your kit blank assembly. Anything dropped into the debris or amid equipment will likely be lost or damaged. Since the kit assembly is a very clean process, I suggest you pick a desk or tabletop available in a well-lit, clean area where you can sit and work. Most kits can be completed in one sitting so you can work in an area and be out of the way should the table or desk be needed for dinner or homework. Plenty of light with a magnifier headset and a pair of tweezers will make your assembly much easier.

1 Your shop is probably the wrong place to assemble laser cut kits. Find a clean, well-lit area where you can lay out the pieces, sit, and work

Check your kit

It has been very rare that I have had missing or broken parts, but it is best to find out at the beginning rather than part-way through. The kit makers will provide missing parts or replace broken ones if you contact them. For years, laser cut blank kits came with the instruction sheet inside the package, although recently to save paper, weight, and waste, the instruction sheet is posted on the kit maker's website. Regardless of where you get the instruction sheet, time spent aligning the pieces to match the diagrams and reading the assembly process is well spent.



2 Just a few of the smaller parts needed for one kit. I find that sorting them out and sticking them to reverse-sided tape orients them and keeps them in place

Know the two absolute keys

There are many important points to being successful in creating these multi-piece pen blanks but there are two imperative ones for quality results. First, the successful turning ability and longevity of the finished pen will depend on the pen blank pieces to be flush and well-adhered to the kit brass tube. Without this, you be susceptible to having pieces break out when turning or have large chunks of the blank break free from the brass tube. The second key to creating a good-looking finished product is to equalise the spaces around the component pieces. The component pieces are slightly smaller than their respective openings to allow for fit, so centring them, equalising the gap around the piece, will make for a more pleasing finished piece.

3 A key to success is having the component parts flush to the inner diameter so they can be adhesively bonded to the brass tube when it is time. **4** With pieces of different species and needed clearances for assembly, there are spaces. Position the pieces visually, equalising spaces

Flush mounting the component pieces during assembly

To push the pieces to the proper depth to make good surface contact with the brass tube requires that you insert the brass tube into the blank during the assembly. The method I find works best for me is to wrap the brass tube with an adhesive protective layer, such as waxed paper to allow the tube to be removed after assembly. This allows the tube to be glued in with epoxy rather than the CA that will be used to tack the component pieces in place. An alternative assembly aid is a silicone assembly dowel available from the kit manufacturer. These properly sized non-stick mandrels allow the component pieces to be pressed to the correct depth while tacking them in place. Upon completion, the mandrel is removed for reuse and the brass tube is adhesively bonded in place. My reasoning for using this method of assembly and gluing in the tube later is for the best adherence of all the component surfaces with a gap-filling adhesive. If the tube is accidentally bonded into the blank using the thin CA used for component piece assembly, I don't think you get the best tube-to-blank bond possible.

5 Rather than use the raw brass tube as your depth control device, wrap it in waxed paper or use the available silicone assembly dowel

Assembling the component pieces

With either the protected brass tube or the silicone assembly dowel in place, tack the pieces in place per the instructions using thin CA. Use only enough CA to position each piece as desired, creating the best spacing of the pieces as they interact. You can use medium CA if you wish since you'll be using it sparingly to only hold the pieces in location. Earlier instructions suggested flooding the surface with thin CA to adhere the brass tube in place. I suggest you ignore these and use the method I've detailed. Fastening the tube in later with epoxy will provide a far superior method of maximising the bonding of the component pieces to the tube. This method has given me the most satisfactory results.

6 Lightly tack the pieces in place with CA as you go. Use the provided rubber bands to help position and hold the pieces as needed

7 Be certain your brass tube is scuffed from the factory or do it yourself. The tooth on the surface lets the adhesive grip better. **8** Get everything ready prior to gluing: a disposable surface, fresh epoxy, pieces to be glued, and mixing/spreading stick. **9** Liberally coat the entire inside of the tube with your properly mixed epoxy. This will fill any of the gaps that may exist and bond the tube well to all the pieces. **10** Insert the tube twisting in place and position it to properly space it with respect to the outer design. Clean out excess glue from the tube ID with a cotton bud

Glue in the brass tube with epoxy

With all the component pieces tacked in place and the tube removed, it's time to permanently bond the tube in place and fill any gaps. Be certain that your brass tube is scuffed. If it isn't, take a few moments to do so. A scuffed brass tube will give the epoxy all the nooks and crannies, or 'tooth', for a good mechanical bond of the epoxy to the tube. I also take a moment to scuff the inside of the blank lightly with a rat-tail file to provide extra tooth in the wood. Sometimes the seepage of the thin CA will provide a slick surface on the inside of the blank that doesn't lend itself to a good bond. You can use any quality epoxy, whether five, 30, 60 minute or other. I use the five-minute bubble pack stuff from the discount store for two reasons. First, it is a quality brand with high turnover. The fresh stuff will always beat the stuff hanging around for years on the shelf. More important, I want the bond to set up quickly. The mixing, coating of the inside of the wooden blank, and then the brass tube only takes a couple of minutes at most. When I position the brass tube inside, I want it to set up and stay put. Longer-cure epoxy can let the tube migrate a bit and ruin your accurate positioning. My method is to have all ready, mix my epoxy and use a long wooden skewer, such those used for shish kebabs, to coat the entire inside of the wooden blank with the epoxy. I then coat the outside of the brass tube lightly, mostly at the end being inserted, with sufficient adhesive to allow it to spread down the length of the brass tube as I insert it. Perhaps not required, but I insert the tube with a twisting motion, pushing it to my desired location with respect to the overall design. All laser cut pen blanks are long enough for a host of kit designs. There will be trimming of wood from both ends once the brass tube is positioned. Pushing the brass tube to the proper position can be done easily using the butt end, clean at this point, of the kebab skewer. I remove any epoxy that has found its way inside the brass tube with a cotton bud while it is still not cured. The blank is then set aside on the level to cure completely. Remember, five minutes is the open time, not the cure time. Nearly all epoxies require 24 hours to come to full strength. I always wait a day before I do any additional processing.

Filling the gaps

Gluing in the tube from the inside will provide a good bond between the inner wall of the laser cut component parts and the brass tube. It will also usually fill any gaps that might exist between the component parts themselves. Rather than count on the component parts having sufficient gap filling as I turn away the stock, I'd like to be certain. Once the brass tube has cured in place, I go over the outer surface of the blank with thin or medium viscosity CA adhesive. My goal is to flood any gaps with adhesive to fill them solid. I don't usually need or use accelerator. I simply take the blank and give it a generous coating of CA, focusing on the separations between the component parts. I don't care what the surface looks like since I'm going to turn all of that away. With everything bonded flush to the tube and any gaps between the pieces filled, everything should be solid in place as I remove stock during turning.

11 Fill the spaces between the pieces from the outside with medium CA glue. Don't worry about the outer level of the individual pieces

Trimming is critical

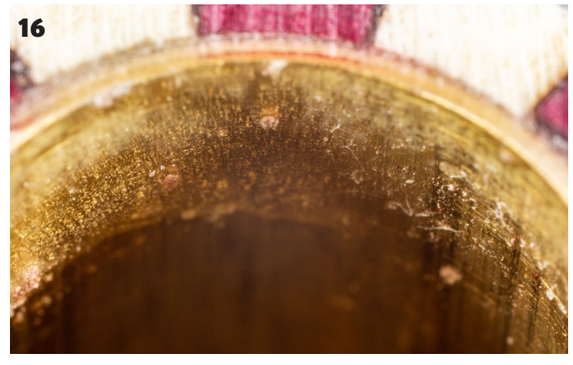
The instructions will tell you never to use a barrel trimmer. I will tell you to never use a barrel trimmer. Do not use a barrel trimmer. Regardless of the type, how sharp it is, how gentle you are, or how skilled you think you are, you will ruin your blank if you try to remove the excess stock and true up the end of the blank with a barrel trimmer. Do you know how I know that you will fail? The best way to remove the excess stock and face the ends perpendicular to the centre line of the brass tube is to pilot on the inner diameter of the tube and sand the blank on a belt or disc sander. Some folks like to freehand the sanding process, but a better result will always be achieved using a fixture that pilots on the ID of the brass tube. Of course, your fixture needs to ride on the table and fence that have been accurately made perpendicular to the sanding face. Sand away all the excess wood until you reach the very edge of the brass tube. This is repeated from both ends. If you sand slowly, letting the abrasive do the work – remember speeds and feeds? – you shouldn't burn the wood and will wind up with a perpendicular face for your pen components to press to when you assemble the finished kit.

12 NEVER use a barrel trimmer on these. A belt or disc sander works well provided you have trued up both the platen and mitre gauge. **13** I don't favour freehanding the facing operation. A gap-free, properly assembled kit requires perpendicularity to the brass tube inner diameter. **14** The only way I can assure perpendicularity to the tube ID is to pilot on that ID with a fixture and aligned sander

> *"The instructions will tell you never to use a barrel trimmer. I will tell you to never use a barrel trimmer."*

Cleaning the inner diameter and chamfering the ends of the brass tubes

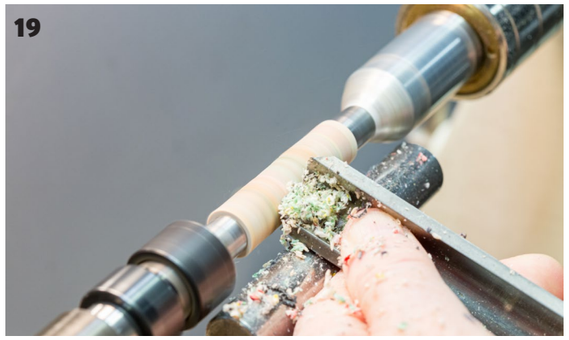
There are times when you didn't clean out the epoxy that crept into the inner diameter of the brass tube. This will make inserting the bushings used for turning difficult and later have the potential to crack the wood when you do the hard press of the pen components. Clean any of the excess epoxy out of the brass tube inner diameter with a rat-tail file. You don't need to worry about anywhere except the $^{3}/_{8}$in from the end of the tube. If that area is cleaned out properly on both ends, you'll be able to slide in the bushings and shouldn't have any issues later during the component assembly. With the ends sanded flush to the brass tube, you'll have a sharp corner on the inside edge of the tube. This makes assembly of the component parts more difficult than it needs to be. Take a chamfer tool and 'break' the sharp corner of both ends of the tube. This chamfered edge will allow for easier assembly of the pen parts later.



15 An inexpensive rat-tail file will clean out the ends of the brass tube of any excess dried adhesive. Any extra can cause splitting with the hard press of the pen parts. **16** All working well will yield a blank that has all of the components bonded flush to the tube, component gaps filled, face properly, and the ID cleaned of excess

Turning the laser cut blank

Whether turning between centres with bushings, on a pen mandrel, or by some other method, mount your blank and turn it as is. Leave the rubber bands used during assembly and any excess outer diameter glue. All of that will turn away in a flash. Since your work is small diameter and securely mounted, you can speed your lathe up to very fast. High speed, sharp tools, and light cuts works well for these pen blanks. I suggest you use only one tool to turn your pens, regardless of the material or style. I use a spindle roughing gouge. Properly sharpened, it is in essence a skew chisel that was bent around a forming mandrel. With the ability to rough the blank and provide a very smooth cut using the wing, you can rough and shape your blank quickly. The very smooth surface resulting from the cut using the wing lets you finish your blank with minimal sanding.



17 Use the pen mounting and turning hardware of your choice. A simple pen mandrel and appropriate kit bushings will work fine. **18** Don't worry about removing rubber bands, excess glue, or projecting pieces. Cut right through them all. Sharp tools, high speeds, light touch. **19** I favour a spindle roughing gouge because of its versatility. Lots of sharpened edge to use and a superb wing to use for turning and shaping

Finishing and assembly

There are no special tricks to finishing and assembly other than good practice. Slow speed rotation and let the sandpaper do the work. Work through the grits, cleaning the debris between grits. Once properly prepped, apply your chosen finish. I almost always use a CA finish but that technique explanation is for another day. Assembly, using a press, your lathe, a hand clamp, or other method holds no special problems.

Conclusion

Hopefully this short list of tips and tricks can help you be more successful with your laser cut pen blanks. Nothing listed here takes any 'extra' time. The process is fast and straightforward. I don't think it contains any fluff. If I didn't think it helped me be more successful and create better results, I wouldn't do it (or them). Give the suggestions a fair try and see if they can help you. I think you'll find them worthwhile additions to your process. ●

20 Sanding and finishing is your choice. My favourite finish for nearly all pens that will really be used is CA. Easily applied, good-looking and durably tough