Kurt's clinic

Kurt Hertzog answers readers' questions

I'm breaking the wood away from the tube on far too many pen blanks. I use CA glue. My failures don't matter whether I use thin, medium, or thick. What am I doing wrong?

I can't offer 'the answer' to what you are doing wrong, but I can offer some information that may reduce your failure rate. First is your comment about the different viscosities of CA adhesive. Many folks think the thin, medium and thick is the speed at which the adhesive cures. This may be true, but the different viscosities are selected for use based on their gap-filling capabilities. Thin is for use with very small gaps between the two materials being bonded. It is most effective being wicked into flush contact joints. Medium for small gaps and thick for slightly larger gaps. The gap, even the largest using thick CA, is still relatively small. Don't expect to bond two materials that have any appreciable dimensional gap with cyanoacrylate adhesive very strongly. You can be successful with nearly any adhesive meant for woods, plastics, or metals provided it is applied to properly prepared surfaces, used with the intended gap for that adhesive, and is a quality, reasonably fresh product. I've used all viscosities of CA (with the correct viscosity/gap match), various cure time epoxies, and many different polyurethane adhesives successfully to bond brass tubes into pen blanks.

Let me better explain each of my suggested requirements. Properly prepared means that both surfaces to be bonded are clean and have some 'tooth' that allows the adhesive to grip well. For the brass tube, you can't have any grease, oils, oxidation, or drawing die lube on it and expect a strong bond that will last for years. The surface should be clean and mechanically scuffed to allow the adhesive to make a firm bond to the metal roughness. These days, most of the kit suppliers are providing kits with the tubes already abraded to provide some tooth. If your tubes aren't delivered scuffed or you don't feel it is deep and gnarly enough, feel free to take some 80 or 100 grit abrasive to it and scratch it every which way. The more scarred it is, the better the ability for the adhesive to hold on to it. Be certain to clean off the sanding debris before gluing.

The drilled hole in your blank should not be polished from drilling at too high a speed. Often, high force and high speeds are necessary because your drill is dull. Sharp drills will cut at reasonable speeds and feeds. If you have burnished the inside of the hole, you won't achieve a good bond to the adhesive. The proper gap is just that. Thin CA requires intimate contact between the surfaces. Slight gaps should use medium and slightly larger gaps should use thick. Epoxies and polyurethanes can be used with slightly larger gaps. Large gaps aren't recommended and even if successful during gluing, they don't hold up well for long haul.

Don't expect your adhesive to bond your tube to the wood strongly when the tube will fall through the hole. Even if you do get the tube to stick into the hole, the strength of the bond will be only minimal based on the three materials, wood, brass tube and adhesive, being the mechanical parts of the joint. Not usually sufficient for turning or long-time finished pen use.

Quality, fresh adhesive should be self-explanatory. If you buy some house brand or no-name adhesive, chances are it may be less expensive because it doesn't perform as well as the major national or international brands. Don't get me wrong. I'm not a fan of overpaying for anything. But I am willing to pay appropriately for good value. I understand the cost of national brands' promotion and advertising is included in their selling cost but there is a reason they are accepted widely and can command a higher price. The cost of adhesive is so minimal compared to the overall project; it seems to be false economy to possibly compromise your results to save a few dollars on a package of cheap adhesive.

Also, if you purchase and use adhesive that has been sitting around for a long time either in the warehouse, retail outlet, or your shop, it likely will not perform as well as fresh. This seems more evident with polyurethanes. If there is lots of dust on the package in the retail store, I suggest you buy it somewhere else where the product has faster turnover.

Epoxies, regardless of five-minute, 30-minute, one-hour or longer types, need to be mixed per the instructions. Often people don't dispense parts A and B too accurately or mix those two parts long enough. They swirl it together until they have it blended and then apply it. If the package says to stir A and B together for 30 seconds or whatever mix time the label says, then do so. Those few extra seconds invested may be the difference between long-term success and failure of the glued joint. Just because the epoxy sets up in the short time in minutes, it doesn't get to full strength for 24 hours or so. You can use it once it sets up but be aware it is continually gaining strength over that longer, full cure time window.

The last item I'll include for your consideration is the grain orientation of the wood blank. You can always have the grain oriented as you wish. Different grain orientations can yield some interesting effects, especially chatoyance, depending on the species. That said, your grain orientation will dictate its turning, sanding, and finishing characteristics. On axis or 90° off axis works well. Of course, 90° off axis does require some additional care since it is like a bowl with face grain, end grain, face grain, end grain and cross grain between each transition on each rotation. The amount of strain you put on your adhesive bond can vary depending on the species, orientation and your aggressiveness.

Any of all the above can play a part in how successful your pen blank assembly and turning are. You didn't ask about it, but I believe we haven't touched on perhaps the most important point. Speeds, feeds, tool selected, and tool sharpness can also play a part in any failures. Ham-handed aggressiveness will get you far more pen blank failures regardless of your blank gluing process.

Light touch and sharp tools are the keys to the kingdom in any woodturning endeavour.

PHOTOGRAPHS BY KURT HERTZOG


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1 Tubes as originally delivered versus the newer, pre-scuffed tubes. A bit of tooth and the absence of most of the die drawing lube 2 Even with the pre-scuffing, the depth of tooth is still minimal. Depending on the time in transit and storage, even pre-scuffed tubes can build oxidation that resists adhesion 3 Regardless of how I receive tubes, I favour using a coarse abrasive to scuff the tubes prior to use. The scratches are deep and erratic, and the removal of oxidation provides good bonding 4 The comparison of coarsely and hand done scratches to machine done and 'aged' tube. Will the pre-scuffed work? Sure, but I think the newly, coarsely scratched adheres better 5 While I do use CA adhesive to glue in tubes, I favour either epoxy or polyurethane adhesives. Always epoxy for laser-cut blanks and polyurethane for nearly all others


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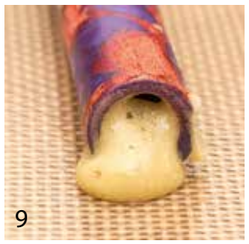
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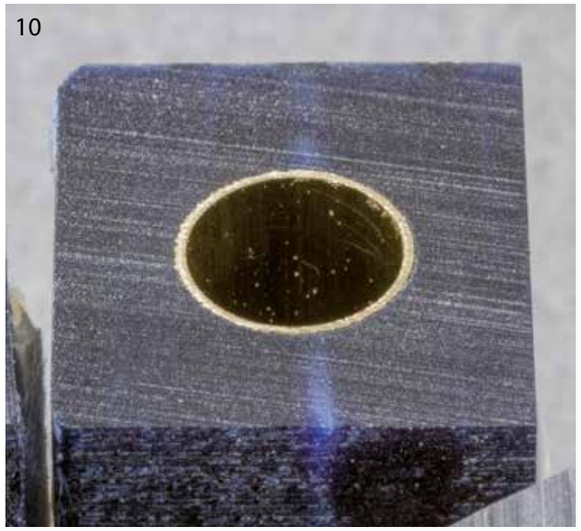
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6 Epoxy works well with laser-cut kits. The ability to fill any minor gaps between the wood pieces and the tube, no push out force like polyurethane drives my choice 7 I use any quality epoxy when needed but I find that the bubble pack brand name products in my discount store serve well. Easy A and B uniform dispensing is also a plus 8 The downside of epoxy adhesive for tube fastening is cleaning excess from the inner diameter of the tube. A Q-tip can remove nearly all of it if done before it sets up too much 9 The extra effort to remove the foamed polyurethane from the blank is worth it to me. The ongoing compliance of the adhesive provides flexibility between the tube and the wood 10 Regardless of the adhesive you use, the fit between the tube and the blank must be reasonable. Too large a gap will create a weaker bond between the tube and the blank 11 Three potential causes of failure. Poor adhesive coating between tube and blank, multiple grain direction variations, and apparently heavy-handed turning

I remember from past columns you've said you don't sell your work. You surely can't have it all sitting around the house piling up. What do you do with all your turnings?

I've sold only a couple of pieces over my 25 or so years of turning. And that was under duress as I was pressed hard to sell even though I didn't want to. Nothing wrong with selling but that isn't why I turn. I don't want a job. I had a job for 45+ years. I turn for my learning enjoyment and fun pastime, not to make stuff to sell.

Yes, I get paid to teach and write. I enjoy those too and do them to share what I've learned. The pin money they bring is an aside. Most of my work is given away to good causes whether raffles for clubs, events, or to friends and students. A couple of the clubs I belong to do large fund raisers to support local or national charitable organisations. A cardboard box of bowls, lidded boxes and ornaments donated helps stock their displays and sales tables. It thins the piles and goes to good causes.

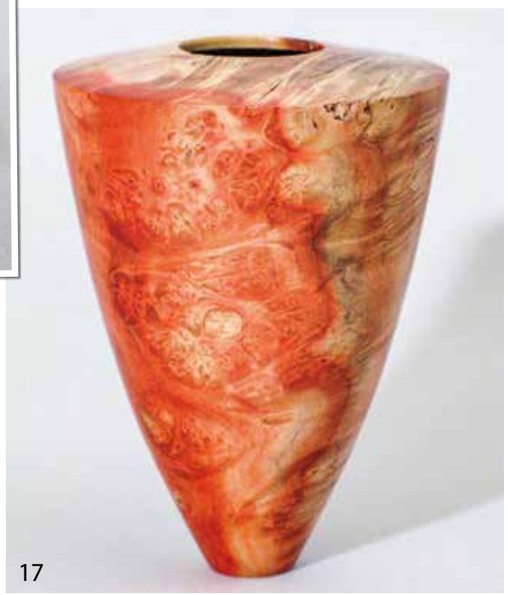
When I travel to teach, I always ask to stay with a host rather than at a hotel. As a small thank you, I leave my host a personalised turning. I do collect turnings from other turners. I like to have at least one piece from other turners whose work I admire. For the most part, we swap turnings for our exchange. There is one wall of shelves in our family room where I store a variety of turnings that I take to my classes. I use these to illustrate various aspects of the class underway, whether fundamentals, bowls, lidded boxes, ornaments, pens or whatever. These turnings are kept specifically to show design, fit, finish, or some points that I feel will be valuable to the students. Most helpful are the turnings with errors that I've kept. I keep these mistakes as well for my benefit and to illustrate various points to my students.

Showing and explaining the mistakes I've made will help the students understand what I did wrong and how to avoid those same mistakes themselves. There is a shelf of my turnings in our family room, mostly pierced ornaments or painted work, that my wife says are 'hers' and they stay put. They are kept because they are a first of something I've tried that was successful at some level. It can also simply be a turning she particularly likes.

A recommendation I make to my students, or any woodturning newcomer, is to keep some of their work from their beginning of turning onwards. I think it's important that you have a way of keeping track of the date of the various turnings you keep as well. Regardless of where you are on your turning journey, having work that you can look back on will let you see your skills progression over time. It is very easy to lose sight of how far you've grown your skills.

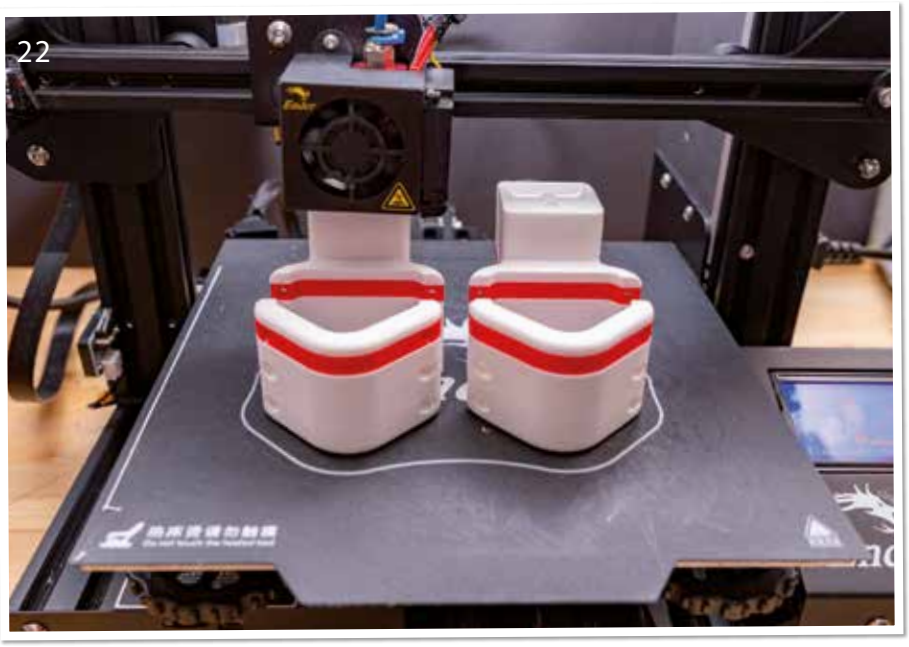
I've included some shots of turnings from my wife's collection and the creation dates. Most of this is older work and was kept, as noted, because it was likely my first foray into that type of work, reasonably successful, or something she simply took a shine to. I don't include these as bragging. They are a mixture of my work that is hanging around. I include them here for those looking for ideas and perhaps some visuals as to my growth over time. I encourage you to keep a growth collection. When you feel that you really haven't accomplished much, you'll be amazed looking back.

12 My first pierced eggshell ornament. Goose egg with African blackwood finials. Lower finial is detachable for transport. Done in 2007 13 Early foray into pyrography and alcohol colouring. Cherry lidded boxes with decoration done in 2011 after a class at Arrowmont with Jacques Vesery and Bonnie Klein 14 A fun challenge project from one of the clubs. A 6 x 6 x 2in block of purpleheart as the starter. This multi-tiered candy dish was my result. Done in 2008 15 My early Sputnik shell ornament using African blackwood finials. No bonding of the finial to the shell. Created in 2011



16a A lidded box done with a painted, partially pierced goose egg with African blackwood base and pull. Created in 2009 16b The most difficult task was creating the flush lip to have the eggshell lid sit on. The base lip, edge flush with the matching taper to snugly fit the shell taper was finicky 17 A hollow form done in ambrosia maple. My first successful larger thin-walled deep hollowing. Done freehand. Created in 2009 18 A coloured version of the Sputnik ornament using the same unattached finial concept. Airbrushed colourings added to the Sputnik shell along with black finials. Done in 2021 19 My little drummer boy holiday ornament. Drummer boy ornament suspending in a pierced and dyed goose egg with blackwood finial. Done in 2009 20 A pierced and painted goose egg ornament suspended between two African porcupine quills. Displayed at the Pittsburgh AAW Symposium instant gallery in 2015 21 My first 'people-sized' funeral urn. Turned in cherry and airbrushed with a threaded blackwood finial closure. Done for an AAW article on turning urns. Created in 2020

◀ I've seen a lot about 3D printing in the turning groups on social media. I'm thinking about diving in. Do you use 3D printing in your turning? If so, what do you use yours for?



In a prior life, one of the stops in my career was with a very large company that was actively supporting the development of additive manufacturing. From the nurturing of the infant start-ups to buying and using the early available machines, I was lucky enough to be involved in 3D printing during the early invention stages and subsequent development. From photosensitive polymer baths to direct metal deposition, our exposure and involvement was an incredible experience. Now that the electronics, software, materials and process have become more highly developed and affordable, every hobbyist can have a home unit with some of the industrial capabilities. I have a small, inexpensive 3D printing unit that I dabble with. Other than the usual animals, pencil cups and desk ornaments, I use it on occasion in my turning efforts. I have made some pen blank casting inserts and moulds but just for saying I could.

As you've noted, there are social media groups dedicated to the process that you can follow for great information.

I have been using my machine to make mounting brackets and other items for use around the shop. Not the most exciting application but it is quick, inexpensive, and versatile enough to be of benefit. One application that I have been experimenting with is making threaded pairs for insetting into turnings. I've always done hand-chased threads in lidded box and urns. The best materials for threading are African blackwood, English boxwood, and Corian. To take advantage of these materials requires making threaded pairs from one of them to inset or insetting pieces of those materials to thread in situ.

I have been printing threaded pairs on my 3D printer to inset into turnings. Perhaps this is heretical but there are huge advantages possible. First and foremost is having a perfectly matched functional set of threads in any size and nearly any colour to use. Cost is minimal and there is no chance of screwing up the threading in the turning as is possible when hand-chasing in place. With the flexibility of nearly any size, depth, and pitch, the only real downside I see is that these threaded components are not real wood. From the purist point of view, it reminds me of the furore I've heard about that painting wood turnings brought back in the 70s and 80s. If you don't have a 3D printer, I highly recommend that you do get one. Whether you use it in some aspect of your turning or not, there is a lot of fun and learning that can had for a reasonable cost.

22 Much of my 3D-printed parts are for mounting brackets and general shop needs. Of course, the strength of materials needs to be considered but there are lots of helpful uses 23 Other than some casting forms and inserts, my turning applications are the creation of threaded pairs that can be inset into turnings. Easy, versatile, low cost, and colour flexibility