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## MAKE A STEAM PUNK PEN

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WITH SPLIT-TURNED LEGS

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THE ART OF REPURPOSING



# MAKE A STEAM PUNK PEN



Photo: Michael Slaughter

Mark Dreyer

*Photos by Julane Johnson, unless otherwise noted.*

It was at the Midwest Penturners Gathering in 2013 that I watched John Underhill do a demonstration on clear-casting pen blanks. That was the minute I went from being a pen turner to a pen maker. That was also the minute that changed even how I

take vacations: now I walk through every store and look for items I can cast into pen blanks. I came upon the idea for the steam punk pen described here—with a crushed Mickey Mouse penny taking center stage—when I saw a penny press that makes elongated souvenir coins.

This article outlines the making of one example of a steam punk pen. But with these simple techniques, tools, and a willingness to practice (and the courage to stand in line at a penny press in front of children), you can discover the vast world of clear-casting. You can incorporate watch faces (see front cover of this issue), carbon fiber, papers, stamps, and a host of other items.

For the example shown here, I used a Majestic pen kit. The tubes for the Majestic are some of the largest available for pen making, allowing the pressed penny to be the star of the pen, yet not overpower the tube. Good proportion of the embedded object in relation to the tube is very important.

## Add background material

The first step is to cover the kit's brass tubes with a background, or base, material. Here, I used commonly available aluminum duct tape (*Photo 1*), to which I added the effect of "rivets" using a ponce wheel. You can use almost any thin material as a background, such as a carbon fiber sleeve (glued and secured) or a label or decal. The choices are limitless.

Aluminum tape is dense enough so you do not need to paint the tubes beforehand. If you are going to use carbon fiber as your background, you would first paint the tubes black. Many other background coverings call for painting the tubes, generally black or white. If the base material requires painting the tube, let the paint dry at least twenty-four hours before applying glue to the tube.

As you can see in *Photo 2*, you don't have to worry about matching the exact length of the tubes when cutting the aluminum tape. I have found that if I have excess at the top and bottom, I can simply fold it into the tube before casting. This does a couple of things. It helps to seal the ends when I am putting the tube into the

## NEW TO PEN TURNING?

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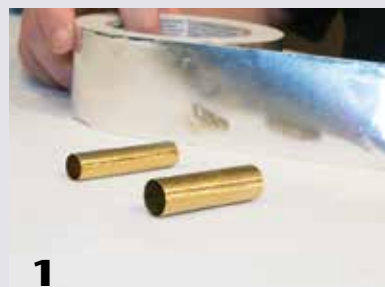
If you are new to pen turning, get a good start by searching the AAW's online archives. Log on at [woodturner.org](http://woodturner.org) and use the Explore! tool to find lots of related articles and videos.

- "Penturning Primer," by Kurt Hertzog, *AAW* April 2016 (vol 31, no 2, page 16)
- "Ten Steps to Better Pens," by Kurt Hertzog, *AAW* Summer 2008 (vol 23, no 2, page 46)
- "Pens," by Scott Greaves, *AAW* Winter 2003 (vol 18, no 4, page 36)

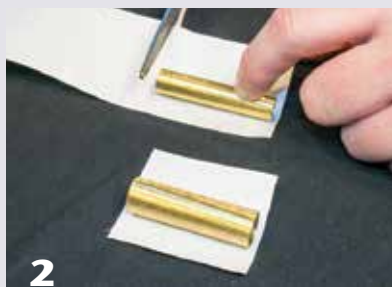




## Create background layer



1



2



3

The author chose aluminum duct tape for the base, or background layer. Cut it slightly oversized, and texture it with a ponce wheel to create the effect of rivets.

mold for casting, and it helps to secure the tape to the tube. You do not want the tape pulling away from the tube during the casting process, as this would generate a significant amount of heat.

As for overlap side to side, I left about  $\frac{1}{8}$ " (3mm) of extra material. After I cut the tape but before applying it to the tube, I added the appearance of rivets. This is a simple process. Turn the tape over, back side up, and using a straight-edge and ponce wheel, slowly roll the wheel over the tape (*Photo 3*). Never go backwards or try to do it a second time, as the rivets will not match up.

When you flip the tape over, you will see the ponce-wheel indentations that look like rivets, which we will amplify with color in a future step. Put in as many rivets as you like. I also roll out some copper tape at this point and put some rivets in it, too.

Remove the backing from the aluminum tape and carefully roll it over

the tube (*Photos 4, 5*). You do not need to place the tube at the edge of the tape. I find it easier to put the tube on the tape about  $\frac{1}{4}$ " (6mm) from the edge and then gently roll one end over and then the other. Aluminum duct tape is very sticky. The good thing is, if you create any small creases in the tape, it can be considered a design element that just adds character to the pen blank.

Now cut the copper tape to various lengths and randomly stick them onto the tube (*Photos 6, 7*).

## Ebonize the tube

I apply ebonizing cream to give the blank that dirty industrial look, which adds to the steam punk effect. Use a paper towel to rub some cream onto the blank in a random way (*Photo 8*). I typically let it sit for only a few minutes and then use ►

## Adhere base material



4



5

Peel the backing off the duct tape and adhere the base layer to the brass pen tubes.

## Add accents



6



7

Copper tape, textured with the ponce wheel, cut into small pieces, and applied randomly, contrasts nicely with the aluminum base.

## Apply ebonizing cream



8

The author uses ebonizing cream, applied inconsistently, to achieve a gritty steam punk look.

a clean piece of towel to rub it off. Non-uniformity is the key here. Leave on as much as you want, or take it off. During the casting process, the blank will lighten up and the color will be reflected more. Put the blank aside as you prepare other elements for the blank.

### Penny prep

Crushed pennies can be acquired all over the place—at theme parks, tourist attractions, baseball stadiums, and truck stops at state lines. Penny press machines are everywhere.

There are many ways to prep an elongated pressed penny for use in a pen blank, but I have adopted the simplest method. To figure out the bend you need to put in the penny, use a punch set and find which punch actually fits into the pen tube

(*Photo 9*). I find a little over-bending is better than under-bending the penny. Use the punch that just fits into the pen tube as a form to wrap the penny around.

When I started making steam punk pens, I used wood to make a bending form. Drill a hole in a piece of dense wood the same diameter as the tube and cut the wood to expose half of the hole (*Photo 10*). For this example, embedding the penny in the top half of a Majestic pen kit, I used a  $\frac{3}{4}$ " (15mm) drill bit. Carefully lay the penny across one side of the block and, using a drill press and the punch, apply pressure to bend the penny (*Photo 11*). Once the penny is wrapped all the way around the punch, you might find that the edges remain proud. Rotate the penny half

way and use both halves of the wood form to sandwich the edges. Press again and you will have a perfectly rounded penny.

Recently, I began using a jeweler's dapping set instead of wood to shape the crushed pennies. The process is basically the same. Determine the correct punch and slot and apply pressure to bend the penny. Pressure can be applied with a drill press, arbor press, or just by hand, depending on the thickness of the metal being bent. As an option, you could add small metal gears to your steam punk blank to add character. Bend the gears using the same method (*Photos 12-14*).

Use a single drop of cyanoacrylate (CA) glue to attach the penny to the blank. CA glue and casting

## Bend accents with wood block and punch



9



10



11

The right sized punch, one that just fits inside the pen tube, along with a drilled and cut wood block, serve as a bending form. Apply pressure to wrap the thin metal element around the punch. Here, the author bends a Mickey Mouse souvenir penny that will become the centerpiece of this pen.

## Bend accents using jeweler's dapping block



12



13



14

An alternative to the wood block is a jeweler's dapping set. Small metal gears add to the steam punk vibe.

resins do not play well together, so a single drop will do. If you use too much or see the glue on the outside of the penny, let the blank sit for a few days to allow the CA to gas off. Gears can be applied to the blank in the same way.

## Cast the blank

There are numerous casting resins on the market, though most people use Silmar 41 or Alumilite. I use both, depending on the project at hand. Alumilite is perfect as a bonding agent, so it is a good choice if you are casting embedded objects like shark vertebra or alligator jawbone or simply casting color. Alumilite has low odor and is very quick setting, so demolding is quick. Silmar 41, on the other hand, does have a distinct smell, but I also find it provides a clearer finish. Both products work for this application, so use the product you like best. Both are chemicals, so please read and understand the instructions that come with the respective products. Most importantly, use gloves and safety glasses when working with these casting resins. With these easy precautions, I have used both products for years with no issues.

I use a horizontal casting mold that I purchased for the pen kit I am using. These molds are very reliable and do not waste resin. To use a horizontal mold, you will need to determine how much resin is needed to complete the cast. A simple way to figure this out is to use water or rice in a mock-up casting—simply fill the mold with either and then pour it into a measuring cup. Then read the amount.

One important note: When you are using small amounts of resin, the mixture's accuracy is critical. With Alumilite, it is imperative that parts A and B are measured to the exact same weight. With a small pour, a few grams over or under can cause

## MORE ON CASTING

### EXPLORE!

To learn more about casting your own turning blanks, log on at [woodturner.org](http://woodturner.org) and use the Explore! search tool to find these articles and more:

- "Pen Blank Casting," by Marla (Mills) Christensen, *AW* August 2017 (vol 32, no 4, page 28)
- "Making a Form for Casting," by Scott Schlosser, *Woodturning FUNDamentals* July 2015 (vol 4, no 4, page 11)
- "Natural Revelations: Esther Bar at the Lathe," by Shai Noy, October 2019 (vol 34, no 5, page 38)

a failure. When you get to a bigger pour, a few grams might not be as important, as there is a greater margin of error. Always use a scale to measure the resin parts in the best mode your scale can do, preferably grams (*Photo 15*). Pen casting molds generally take 1 to 2 oz. of resin with some left over. To minimize error, it is best to make a few sets of blanks and plan for a slightly larger pour.

Clear-casting typically requires pressure, so after I prepare the resin for pouring and fill the molds, I place the molds in a pressure pot (*Photos 16, 17*). I have found that 40 to 50 psi is more than enough pressure to drive out the air bubbles. When using Silmar 41, I leave the molds under pressure for at least twenty-four hours; for Alumilite, 90 to 210 minutes does the trick. I let my cast pen blanks cure for about a week before turning them, though this is personal preference. ►

## Weigh, pour, and pressurize



**15** When casting the pen blanks in resin, weigh the two parts carefully to ensure the proper mixture.



**17** Pour the resin into the mold, then use a pressure pot to drive out the air bubbles.



## Keep a Sharp Edge!

I see many people struggle when turning acrylics. The number one issue is dull tools. If you use high-speed-steel tools, sharpen them before each pen blank. As you build your skills, you will know when you need to sharpen and when you can cut another blank. If in doubt, sharpen. If you use carbide tools, realize that just because you don't need to sharpen carbide does not mean you don't need to get a fresh edge. The more reputable carbide tools hold an edge for twenty to forty hours of turning before needing to be rotated. And if you are new to carbide, try the "negative-rake" cutters, which make it much easier to master turning acrylics.

### Turn, sand, and assemble

Mount your cast pen blank on the lathe as you would any other pen blank. Turn it down to slightly more than  $\frac{1}{16}$ " (1.5mm) proud of the bushing. Note that having the penny embedded in the blank means you should leave a small bulge in the center and taper to the ends.

Next work the corners. Many pen blanks are ruined when sizing the blank to the kit. This detail, seen in the transitions from blank to kit, makes the difference between a professionally turned pen and the amateur variety. Once I have it to  $\frac{1}{16}$ " proud of the bushing, I use a very sharp spindle gouge to refine the transition. Find the edge of the bushing and roll the cut back into the blank. I let the tool find the edge in a closed position, then roll it to

open (flute facing up). This guarantees a perfect fit.

You can now turn down the rest of the blank or even rough-sand it to final shape (*Photos 18, 19*). With proper turning, the sanding should be minimal. But if you are at all concerned about cutting through the resin and exposing an embedded item, opt for sanding. No one will know how the blank was completed, and erring on the side of caution is between you and the blank.

I sand through the grits with sandpaper and then use Micro-Mesh®. I start at 220 grit paper, then go to 320. For 400 grit, I use wet/dry paper wet. Do yourself a favor—when the sandpaper looks used, throw it away. You will be amazed how much better your finishing will

become if you do this. When used correctly, sandpaper is a cutting tool. If that tool is used dull, it will simply burnish your pen surface, rather than abrade it. Plus, dull paper may introduce unwanted lines due to fracturing.

When using Micro-Mesh®, I rotate my application with each grit. I use the first grit with the lathe on. Then for the next grit, I shut the lathe off and sand along the length of the pen blank. And I continue alternating methods with each new grit—lathe on, then off. Remember, the purpose of sanding at this stage is to remove the scratches from the previous grit, not to shape the work. If the sanding of a pen blank takes more than five minutes, you need to refine your tool technique.

After the sanding is completed, I apply a quick coat of Novus® scratch remover and then buff the blank. Buffing your pens will give them that glass-like finish.

Finally, assemble the pen parts, following the kit's instructions. Confirm that the tubes are clear of any debris such as glue or tape. And keep in mind, too much pressure is your enemy—the components should fit together with only a moderate amount of pressure. ■

### Turn it!



Use sharp tools when turning acrylics. Shape the pen barrels, sand, finish, and assemble.

Photos: Donna Dreyer

*Mark Dreyer lives in Aurora, Illinois. He is an electrical engineer by trade and has been a pen turner and maker for more than twenty-five years. Mark has demonstrated twice at AAW National Symposia—2016 in Atlanta and 2018 in Portland—and at regional events such as Turn On! Chicago, the Midwest Pen Turners Gathering, and at numerous local clubs. He is an active member of the Chicago Woodturners and the Windy City Woodturners. Mark's work can be found at [markdreyerturning.com](http://markdreyerturning.com).*