Working With Acrylic

Few materials call makers turn are surrounded by as much mystic and mystery as acrylic. This article will show you that if you can turn wood, you can turn acrylic, and with the same tools and machines you use to turn wood calls.

We will cover cutting, drilling, turning and polishing.

Cutting Acrylic Rod

Solid cast acrylic rod comes in lengths from 3 inches to 4 feet, which means that at some point we are going to have to deal with cutting it.

I have cut acrylic rod successfully three ways. First, a hack saw will work, but care must be taken so as not to crack it when you get close to cutting through. I have also cut cast acrylic on my band saw, and it also works very well. My preferred way to cut cast acrylic is with a chop saw or miter saw. A slow steady motion works best. ALWAYS wear eye protection when cutting solid cast acrylic rod.

Drilling Acrylic

Acrylic blanks can be drilled in several ways. We will cover drilling with a drill press here, but it can also be drilled on the lathe.

The keys are to go slow by setting your drill press on the slowest speed, use a cutting agent such as Automatic Transmission Fluid (ATF) and to clean your drill bit frequently.

I use the cheapest ATF I can find. A trick I use to put the ATF in the blank is to use a Catchup bottle. The long spout makes it easy to get the ATF where I want it. The acrylic is held in a simple shop made jig.

Start drilling by making a initial hole about 1/2" deep. The bit I am using here is a standard 5/8" jobber bit bought at Lowes. It has not been modified in any way. Remember, the key is to go slow and clean your bit often. Heat is bad. It will melt your blank and you stand the chance of getting your blank stuck on your drill bit.

After you have your hole started, add some ATF and drill down about ½ to ¾ of an inch and back out and clean off your bit.

Continue this way until you drill through your blank.

Turning and Polishing Acrylic

Once we have our blank drilled, it's time to turn it. I normally use some spray cleaner like 409 to clean the ATF off the blank first,

The tools I use to turn acrylic are

Skews, Scrapers, and Parting Tools

I have never had any luck using gouges and do not recommend then for turning acrylic. Again, ALWAYS wear eye protection when turning acrylic.

The next step is to set our lathe speed. I have had the best luck using speeds of 1240 to 1800 on my Jet Mini Lathe.

I think you will find that these speeds will allow you to avoid heat build up and maintain control of your tools which will decrease chipping of the acrylic blanks.

I use a Skew or Round Nose Scraper to bring the blank to round if my drilling was off a bit. Remember, take LIGHT cuts and control your tool. Do not let your tool tilt or lift off the tool rest, or you stand the possibility of chipping your blank.

A sharp parting tool cleans up the ends and squares up the blank.

Sharp tools are a must. You are looking to produce a thin ribbon of material. Turning acrylic is a slower and gentler process than turning wood. Use a steady and light hand, but ensure your tool stays flat on the tool rest.

I use a Round Nose Scraper to do most of the shaping on my blank. Take very shallow cuts. Don't try to take too much off at a time and keep your tool flat to the tool rest. If your tool rotates or lifts up, you stand the chance of a catch which will chip the acryilc. If this happens, depending on how deep you chip it, you can continue turning over the chip, but be careful when going over the chipped out areas as they will try to pull your tool into them. Take a very light cut over these areas and they will work themselves out. A tip is to take the tool rest off your lathe and run the edge on a belt sander to smooth it out. If you don't have a belt sander, a sanding block and some 120 grit with a little elbow grease will get the job done. This allows you to use more of a gliding motion as you shape your blank with the scrapers. Again, it is very important to keep the bottom of your tool flat to the tool rest and go slow taking shallow light cuts.

Sharpen your tools when you start feeling a little heat or they stop cutting smoothly.

At this point, the call barrel is taking shape. All of this work has been done with a skew and a round nose scraper.

I use a small 1/8" round nose scraper to cut my lanyard groove. This is a specialty tool, but you can make one from a drill bit by epoxying the drill end into a handle and grinding the other end to shape.

Once I have my basic shape, I start to clean it up with some 100 to 120 grit sand paper. Depending on how smooth your cuts were, you might need to start with 60 or 80 grit. This is the final shaping of the call barrel.

Remember to slow your lathe down to the slowest speed for sanding.

We can now cut in a lanyard groove, and accent lines if we want them. Turn the lathe back up to 1200 to 1700 RPM.

I use a tool that I have ground to a sharp spear point to cut in some accent lines. Do not go too deep. We are just trying to score the lines where we want them at this point. We will deepen them in a minute.

To deepen our accent lines, and polish them up, we will use some .055 sanding cord in 180 grit. You can get this sanding cord from McMasterCar, www.Mcmaster.com for about 10 bucks a roll.

Here I am using the sanding cord to Deepen the accent lines. Remember to slow the lathe speed down again, and cut a piece of sanding cord about 5 inches long. Hold it in your hands in the line you scored in. Do not EVER hold the roll of sanding cord in one hand and the end in another. There is just too much of a chance for the sanding cord to get stuck in the groove and wrap itself around the call barrel. If your fingers are in the way, they are going to get cut.

After sanding in my accent lines, I start sanding the barrel on the lathe. I adjust the speed to the slowest it will go and work through the grits from 120, 150, 180, 220 and 320.

With each grit, I fold the sand paper in half and the edge inside the accent grooves. This sands them as I sand the call.

Once I have sanded to 320, I start wet sanding. I use Novus plastic polish, but Brasso also works very well. I wet sand the out side of the barrel, and the inside of the accent lines up trough the grits to 1000 grit, and then polish with

the Novus or Brasso until I am satisfied with the finish.

The barrel is then taken off the lathe. You can see that the ends of the barrel are rough and need to be cleaned up.

To clean up the ends of the barrel, I am going to use my drill press. I have taken a ½" bolt and cut the head off of it, and then wrapped athletic tape around the bolt to hold the barrel securely in a press fit.

It doesn't look like much but it works like a charm.

Here you can see my bolt chucked up in my drill press with the barrel of the call on it. The red circle on the drill press base is around a simple art gum eraser that I use as a sanding block.

You can see how I use the art gum eraser and some sand paper as a sanding block. I go through all the grits, from 100 to 800 on the ends of the barrel.

Once one end is done, I flip the barrel around and sand the other end the same way. By folding the sand paper, you can use your fingers to get up inside the barrel and shape it into a bell if you want. Just take your time and go slow and use each grit.

Here are the results of cleaning up the ends of the barrel.

The next step is to polish the inside of the barrel.

Again, we are going to do this on the drill press, and we will use another shop made "tool"

Here we have a ½" wooden dowel that has been cut to about 6 inches long. One end has had a slot cut in the end and the other has tape wrapped around it to serve as a stop when we chuck it up in our drill press.

Here you can see how our dowel gets chucked up in the drill press.

Now it's time to start sanding and polishing the inside of the call barrel.

With the drill press running at the slowest speed, the call barrel is slipped over the dowel with the sand paper and sanded through all of the grits from 100 to 1000.

Once sanding is complete, we switch to some soft paper towels and our polishing agent. I use Novus but Brasso will also work as will other polishers for plastics.

The paper towel is cut into squares and slipped on the dowel just as we did the sand paper. Running at the slowest speed again, polish the inside of the barrel. Don't be afraid to

change your paper towels and add more polishing compound until you get the results you want.

As you can see, acrylic can be worked on your Jet Mini Lathe just as you work wood, with a few modifications. It takes more time, but the results are well worth the effort.

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