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Tutorials

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Using Acrylic in your Segmented Turnings

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Intermediate

In this tutorial, I show how I use acrylic as the raw material for my segmented turnings.

Why Acrylic

I do not like to cover the grain of wood. I keep a large variety of wood colors and grains in my inventory. I almost never dye or st wood. Other embellishments, like burning and piercing, just do not appeal to me. So, when I had some ideas for using color, I tho acrylic and just worked with it until I was able to make it do what I needed.

The designs I could make were limited because of cost and material size availability. Therefore, acrylic only works for a limited n of forms. I am pleased with the result of the forms that I have tried so far.

Raw Material

Acrylic pen blanks are available in unlimited designs and patterns. But they are very expensive to buy as 5" pen blanks and they c result in too much waste. I found a supplier that had long lengths at less than half the usual price per inch, and with much less was became something to try. Acrylic is consistent in dimensions and requires very little prep before using. Some of the designs have that change with orientation. Be sure to mark the same surface of each stick before using them. In Photo 1 below, I have marked t side with a magic marker.

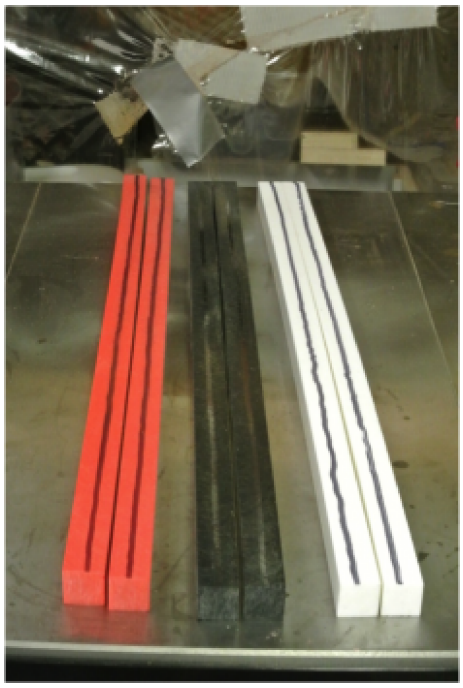

Photo 1

Some of the colors can be very vivid. See Photo 2.

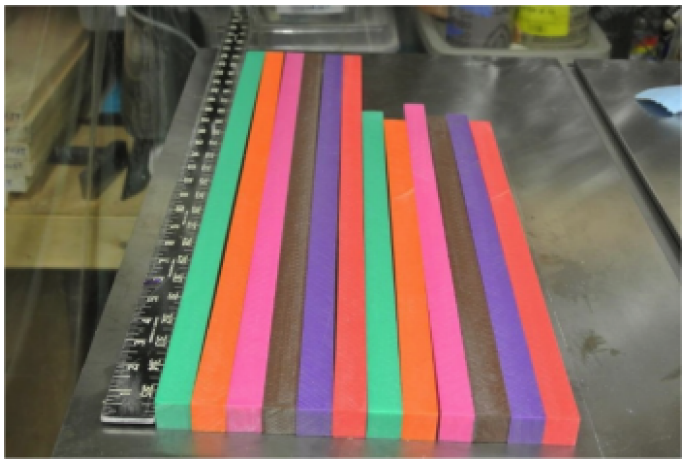

Photo 2

Making Segments

Cutting the segments required some trial and error. This material softens when it gets hot. This could result in surfaces not suitabl gluing.

I cut my segments on a Festool Kapex Miter Saw which has a speed control. This is a pricey saw, but is my primary segment cutti and I wanted the best.

I built a table for the saw out of MDF. This gave me a clean, safe surface to work on. Note the featherboard and hold-down that I Photos 3 and 4. The acrylic will chip if not held down securely.

I cut at the slowest speed, which seemed to minimize the distortion of the surface caused by the heat. I also used the Kapex Aluminum/Plastic blade which has a different tooth configuration. That also seemed to help.

I found that with my method I was able to get perfect angles and surfaces. Others have told me that they have success using a tabl and sled with standard wood cutting blades. In order to cool both the blade and material you could try resting between cuts.

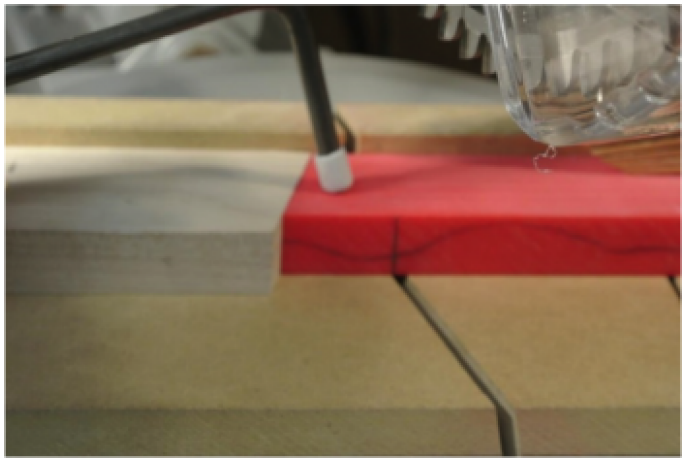

Photo 3

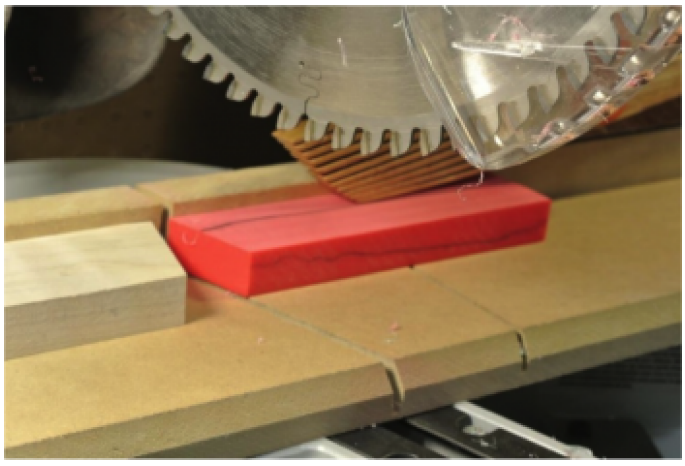

Photo 4

Photo 5

Ring Assembly

When working with acrylic, the assembly of the rings is different than working with wood because of the open time of the adhesiv
final method was to dry-fit the ring into a band clamp. I then loosened the clamp and applied glue to one surface of one segment.

I apply glue to only one side of each segment (except the last) because when I tried both sides, which I thought would be faster, I
unable to get consistent joints. Feel free to try it, you may be able to work faster that I can.

While tightening the clamp the freshly glued segments want to float. It is important to keep the ring as flat as possible to maximiz
thickness during flattening. I push down firmly on the 2 newly glued segments while tightening to alleviate the floating.

To save time between segments, I glue 2 rings at once. Alternating rings allows for enough setup time to go back and forth and fir
rings in the time of 1 if you were waiting between segments.

I found it helped to remember my place by marking the segments with a Sharpie as I went around the ring.

Photo 6

Photo 7

I left the completed assembly in the clamp for 24 hours for 80% strength bonding. Care must be taken as the clamp is tightened, s material moves and floats while gluing and is hard to keep round.

Photo 8

If you are not careful, you may need to resort to the half ring method where you cover both sides of the joint with adhesive and th sit to dry. (This is a less precise method to making rings.)

Photo 9

Ring Sanding

Once the adhesive is dry, I sanded both sides of the rings flat. To do this, I used a drum sander. All the rings were flattened and un sized. See Photo 10.

Photo 10

Once the rings were flat, I brought them to my disc sander to ease the edges. My goal was just to reduce the amount of turning ne on the lathe. This process not only saves turning, but reduces chance of shattering the sharp corners. It also reduces the shock to y elbows when turning this very hard material.

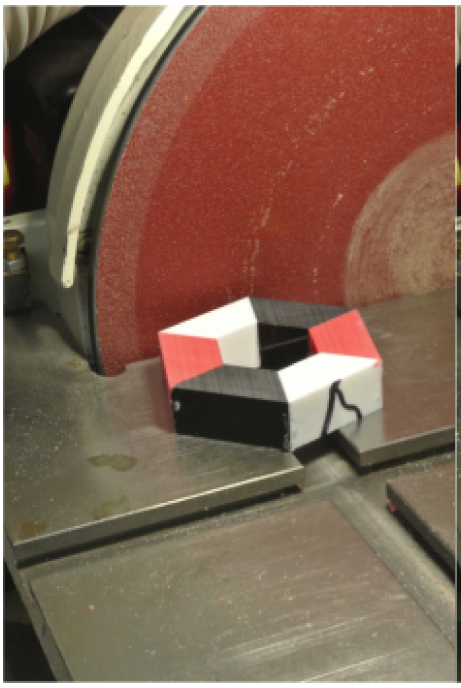

Photo 11

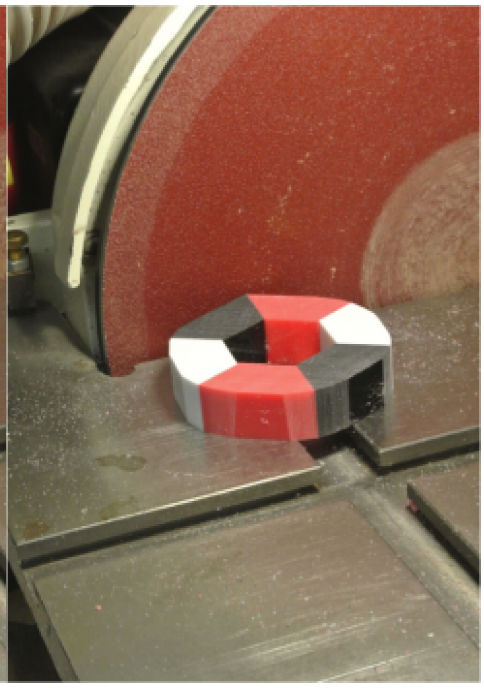

Photo 12

Ring Stacking

I like to stack and glue the rings on the lathe since it's easier to keep them centered. I made a plug for the bottom by gluing short p together and turning it round to fit the bottom ring. I glued the plug quickly using the adhesive.

The bottom ring (with the plug installed) was held to a wooden glue block and faceplate using 5-minute epoxy. I used centering d centering. See Photo 13.

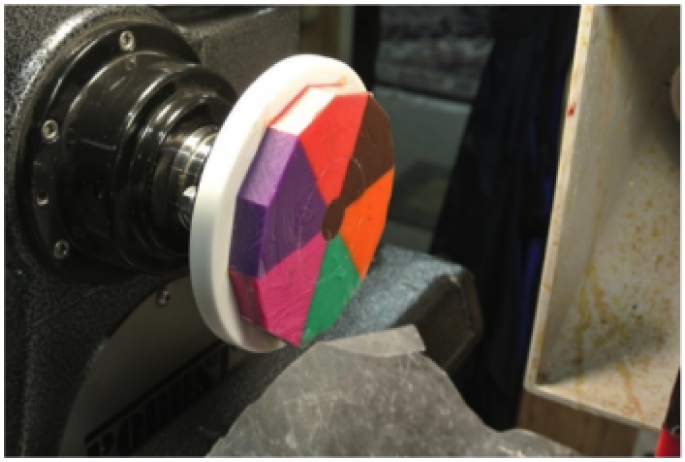

Photo 13

Because the adhesive is a solvent and results in a weld that dries quickly, I clearly marked the brick lay for quick assembly. I foun applying adhesive liberally to both faces could result in adhesive build-up. I applied the glue liberally to one face and made sure I rubbing action to soften the other surface. This rubbing method is recommended by the adhesive manufacturer. On other projects used a Corian faceplate with heavy duty double -sided tape. This was easier to remove and finishing the bottom was easier.

I placed the next ring to be glued into my Cole Plate Jaws attached to a chuck which is held in the tail stock quill.

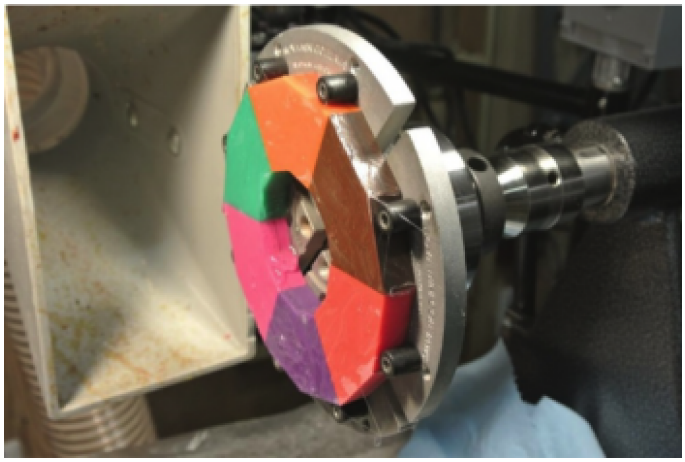

Photo 14

Next, I applied the adhesive.

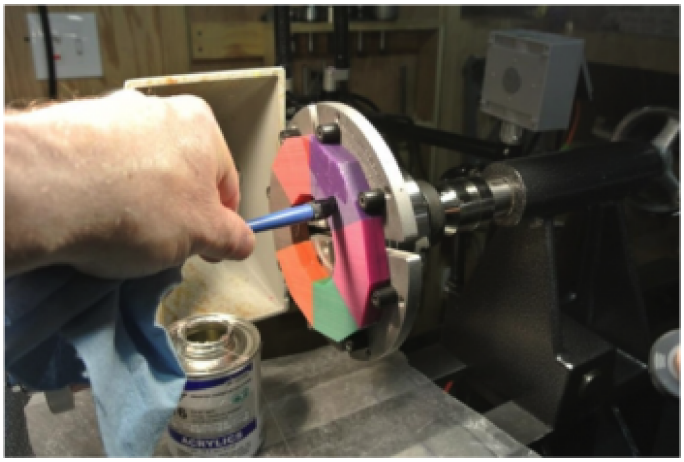

Photo 15

I glued the rings together by bringing the tailstock up to mate with the previous ring. After a few seconds the ring will not move. I how hard and rigid the material, if you put too much pressure in the center of the ring the outer edges will spring out and give a ba circumference joint. This must be avoided.

To avoid this, after the initial few seconds of set, I back off the centering cone and replace it with a rigid flat plate of sufficient dia to clamp the whole ring flat.

Because the adhesive actually melts the acrylic, if, after curing, you see outer circumference voids you can repair them by rubbing glue on the void. The material will soften enough to fill.

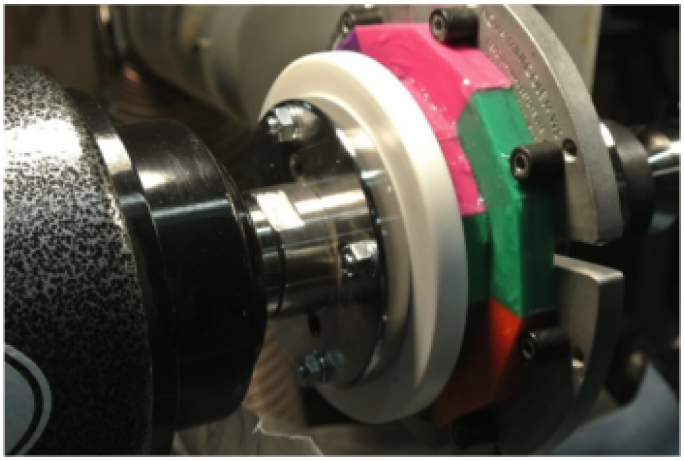

Photo 16

Turning

I experimented turning the material by making some pens. I found that you cannot be aggressive or it will shatter. Eventually, I fo that using a gentle finishing cut using the radius of the bowl gouge wing curve in a steady gentle cut gave me long strands of cut. that as the tool gets hot it cuts better as it softens the material.

Be careful when turning the inside of a bowl--normal cutting will produce small, hot, shards until you get round. **These hu Wear gloves or tape the hand closest to the tool.**

Final shaping can be done with a flat shear scrape. The material melts from the friction while leaving a perfectly smooth surface.

Sharpen your tools often because dull tools have more friction and make it harder to get a smooth cut.

It also seems to help to have your tool rest below center to get a better angle on the gouge wing.

Photo 17

Sanding / Finishing

I power sanded starting at 180 grit and sanded through to 1500 grit. I suspect that using mesh disks would be better to reduce load
Using compressed air, I cleaned the piece and the area between grits. Sanding scratches are difficult to remove, so clean thorough

Photo 18

The final finish is Hut-brand Ultra Gloss Plastic Polish. I used it exactly as directed. I applied it on the lathe and used a rag at 2,0
RPM. The piece will get hot. The Hut polish puts a beautiful finish on it.

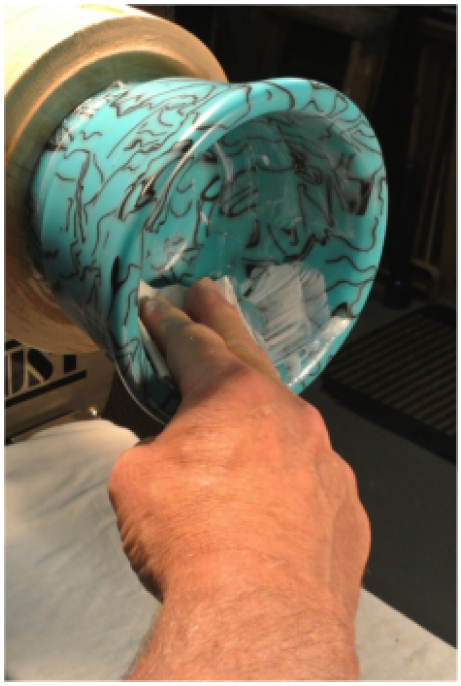

Photo 19

When you're done polishing the piece, just part it off the lathe. As you can see in Photo 20, I cut the wood glue block and not the a
I once again used my Cole Plate Jaws to hold the bowl while I parted it off. I then moved this chuck to the headstock to finish the
of the bowl.

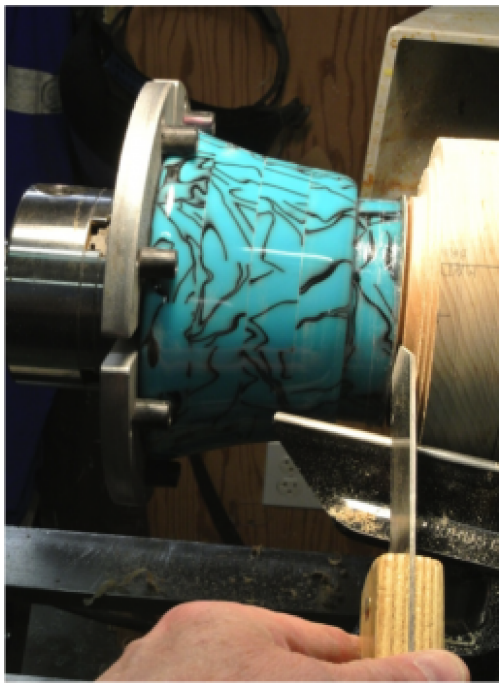

Photo 20

Resources

- I purchase my acylic stock from Bear Tooth Woods. Give them a call. They will sell almost everything they have in 1 mete
  lengths. I had them cut it into 24” lenghts (my shelf size) with some left over. This allowed shipping by USPS which was
  inexpensive.

- The adhesive that I use is from IPS Corp. The product I used is from their SCIGRIP Division. It is #16 adhesive. I chose th product after consultation with someone in their engineering department. The can says that it provides for 5-6 minutes of w time. I had hoped that I would be able to glue a complete ring in that time. It really is only workable in this application for 10 seconds. They supply it with an applicator. The needle was too small for this viscosity material. I applied it with one of small size new plastic glue applicators. The adhesive does not stick to the plastic brush. You can clean as you go or let it ha and just pull it off. You can buy the #16 adhesive from Amazon in 1 pint cans starting at $17.27, click here for more inform or to purchase.
- Final finish is Hut brand Ultra Gloss Plastic Polish. For more information or to purchase, click here.

Photo 21 - Adhesive (left) and Hut Ultra Gloss Polish (right)

Gallery










While doing segmented turning with acrylc has a few challenges, I am very pleased with the results. I am glad I was able to find a introduce color into my work without altering the natural beauty of wood!