

Embellishing Your Woodturning with Inlay Techniques

by Ed Malesky

Overview

This tutorial will cover inlaying granular or powdered materials into cracks or cut recesses in your work to add another dimension of decoration.

The two main techniques that will be covered are:

1. Using epoxy type binders with colored materials added
2. Using CA glue to glue powdered materials

While there are many inlay materials, this tutorial will cover use of:

1. Soft minerals, like turquoise, malachite, etc.
2. Soft metals like brass, copper and aluminum powders
3. Plain or dyed wood cuttings or sawdust
4. Specialized InLace nuggets and powders
5. Epoxy colored with tempera paints and InLace additives

The Recess

There are several kinds of recesses that can have inlay applied:

- Natural cracks and fissures in the wood
- Rings cut on the lathe
- Dots drilled with a Forstner bit
- Patterns cut out with carving tools

Natural Cracks

The size of the crack determines the best way to fill a crack and what materials should be used.

Whichever filling method you use, you should get the surface pretty near complete and do basic sanding. Then to prevent staining, especially with CA, apply paste wax or sanding sealer to the surface around the recess before filling.

If the crack is natural, make sure the edges are solid, ie. bark inclusion. If the edges are loose, pick them out or use the Dremel to get to solid wood.

Refer to [Nulling Voids: Filling Cracks and Holes in Wood](#), by Lynne Yamaguchi for a detailed explanation of techniques.

Decorative Recesses

You can cut your own recesses to fill for decorative purposes. They can be as simple as decorative rings cut on a platter or the rim of a bowl or specific designs or more artistic pictorial efforts.

Decorative rings are the easiest. Use a sharp parting tool to the ring about 1/8" deep. Rings about 1/8" wide look best and you can add a second, closely spaced ring to add more drama.

Cutting rings on a platter are easier since you don't have to battle gravity when you fill with epoxy/InLace. Filling a ring on a bowl rim when using epoxy/InLace, requires the use of a thickener, like Thicken-It or Cabosil to keep the epoxy/InLace from dripping as you move around the bowl. Even with a thickener, it's likely that you'll have to do a section, let it start to set and then move to the next section.

Dot patterns can be created with a forstner bit. I create a depth stop to limit the hole depth to 1/8". I generally lay out a grid pattern using my indexing wheel and then drill at the intercies.

Line patterns can be cut using a Dremel with a cylinder burr



You can either freehand or predesign a geometric pattern. Cut the slots about 1/8" deep and between 3/32 – 1/8" wide.

More artistic patterns can also be created. This artistic inlay has been refined by [Stephen Hatcher](#).

He has several good articles under the Techniques section.

Simpler artistic inlays can be created by using stencil patterns, since there is a separation between the areas of color.



I transfer the pattern to the piece with either carbon paper or xylene-toner transfer. I use a ball nose burr to remove the bulk of the wood, starting by outlining the sections and then removing the wood in the rest of the section, again about 1/8" deep.



The sections are then refined by using an inverted cone. This allows cutting clean edges with a bit of undercutting to help retain the inlay material.



Filling Material

Many materials can be bought from our favorite woodworking suppliers, but places that sell materials for gourd decoration are also good resources.

The materials you use must be soft enough to either cut with our turing tools or to be able to sand with our regular sanding supplies.

Minerals that are suitable are those that are softer on the moh hardness scale

- Moh's hardness 3-6 works best, where 1 is talc; 9 is diamond. Best are:
 - Azurite
 - Malachite
 - Calcite
 - Fluorite
 - Turquoise is a 6, borderline for use

Soft metals like brass, copper and aluminum can also be used. Powdered materials end up looking like solid metals in the inserts when polished take a nice shine. Brass shavings can also be obtained, generally for free, from places that cut keys. This material also works well, but generally finishes a bit duller than the powdered metal.

Natural materials like sawdust, dyed sawdust and even coffee grounds can be used. Dyed sawdust is available in many colors from the [Sanding Glove](#). However, all these materials need to be dry before use and are generally only used with CA.

Epoxy and Inlace have lots of options:

- Lots of colors and textures are available
 - Dyes
 - Metallic dust
 - Stone flakes
 - Nuggets and granules
 - Thicken-it

Can all be mixed in with the epoxy/InLace resin and when thoroughly mixed, have the hardener added.

Adhesives

Cyanoacrylate – I tend to use this with metals and minerals. The colors seem much brighter than when they are mixed into Epoxy/InLace. Thin CA is used for this process, since it will flow through the fill material and then harden. If filling a natural void or crack that goes through the work, It's better to fill from both sides. You could therefore use some thick CA deep in the crack to set a barrier between the two sides and to keep the fill material from running through the crack. You could also partially fill the crack with sawdust and CA to reduce the amount of more expensive filler, but remember if you do that you can't sand too much of the material away when finishing or the sawdust will show through. Remember to use sanding sealer or paste wax first to keep the CA from staining.

If the crack is only 1/4" or less, you can probably put the fill material in and then drip on the thin CA. I like to use a special, thin applicator tip to control where the CA goes.

If the crack is thicker you can layer the material, ie. adding some material and then adding the CA, then adding another layer and more CA until you've filled the recess.

You cannot dye CA glue, so you rely completely on the fill material for your color.

Fill to just level or slightly above the level of your cut out. Once filled you can spray the inlay with accelerator. This will prevent the CA from soaking into the wood too much.

Epoxy & InLace – Although the materials are different, I tend to



treat them the same.

InLace

- Acetone based resin originally designed for eyeglass frames
- Does not absorb moisture, shrink or expand
- Shelf life approximately one year. Keep away from heat, sunlight, sparks and flames and seal well after use
- Available in ten premixed colors/textures and clear

A great reference for InLace is "[InLace Techniques](#)", by Betsey Sloan.

Epoxy

I like to use 30 minute epoxy for inlay, since the addition of fillers or colors to epoxy shortens the shelf life, which makes 5 minute epoxy of little value, except for very quick patching jobs.

You can use all the InLace fillers with success in epoxy.

The time reference on epoxy, ie. 5 or 30 minutes in the time to set, but not cure. It is still advisable to wait several hours or overnight before sanding.

Application

Whether using epoxy or InLace, all the fillers should be added to the resin before the hardener is added. This will give you the longest working life.

If the recess is cut so that gravity will pull the material from the recess, add a filler like Thicken-It or Cabosil, both fumed silica, to add viscosity to the mix. Again add the material before the hardener is added.

I use popsicle stick to add the material to the recess and prop up the woodturned piece so that the recess is as level as possible.

If I am working around the piece, I make small batches of epoxy/InLace and do the most level areas and wait until they have set up a bit and move on to the next area with a new batch.

Once I have all the material added, I go back and check for any sags or bubbles that keep the recess from being totally filled. If there is a problem, I make another small batch and fill in. Doing this before the epoxy/InLace has fully cured, improves the bonding between the patch and the material in the recess.

Sanding and Finishing

The inlay now has to cure. For CA, this can be a fairly short time, especially if an accelerant is used.

The time for epoxy/InLace will vary based on the amount of filler used, how well you mixed the epoxy and the curing temperature. I generally wait overnight and then test by pushing my fingernail into the inlay. It needs to be hard, otherwise the sanding will smear the epoxy/InLace over your piece. Sometimes I have had to wait several days.

Once cured I mount the piece back on the lathe and use a hard sanding disk pad in a drill and start with either 80 grit sandpaper disks. I sand at low speed, generally around 500 rpm. If I have a lot of extra material above the recess, I will sometimes use a shear cut with a gouge to remove it and get me back to the wood level, but I generally sand.

Take it easy, since you don't want to generate too much heat. Once you get the sanding level with the wood, switch to finer grits and work up through the grits polishing the surface. Sand the inlay and the surrounding wood to blend in. If you hadn't finish sanded the whole piece, then sand everything through all the grits.

I often use Abralon pads and sand up through 4000 grit since it polishes the inlay well.

Once sanded I apply my favorite finish. I often use lacquer, but any finish will work.

Resources

1. Lynne Yamaguchi - http://www.lynnemaguchi.com/filling_cracks_rev.pdf
2. Stephen Hatcher - <http://www.e-z.net/~summitweb/index.php?n=8>
3. InLace Techniques and Supplies - <http://www.inlacebook.com/>
4. Dyed Sawdust - <http://www.thesandingglove.com/>
5. Info for inlaying gourds, but works for wood too - <http://www.arizonagourds.com/inlace.html>
6. Magazine articles:
 - a. "Stone Inlay in Woodturnings", American Woodturner, Winter 2002
 - b. "The Addition of Minerals to Woodturnings", More Woodturning; Sept-Oct 2006, Nov 2006 & Dec 2006