Casting Turning Materials with Alumilite Resin

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Creating materials for turning with Alumilite has been an exciting and rewarding process. This demonstration is going to hopefully provide everyone with new ideas or insight into an exciting and expanding field related to woodturning. These are some of the experiences I hope to share……

- Making turning blanks by adding resin to the casting project, such as pen blanks, game calls, bowls, wine stoppers, shaving brushes and plates or platters. A means of enhancing or improving unsuitable wood by filling flaws such as cracks or worm holes.
- Embedding objects in resin to create a design or capture an object in a turning project. Keepsakes such as coins, stamps and lapel pins.
- Pouring the resin into a mold to create a casting which can be turned by hand. Pen blanks, handles and much more.

What is trying to be achieved in all of this?

- Salvage or improve wooden objects that are unable to be turned or used by turning methods by filling voids, cracks or other imperfections.
- Add colour or design to compliment or augment the natural beauty of wood.
- Recycling wood or off cuts that would normally be thrown out.
- Create designs and then add these designs back into turnings.
- Experimentation of colour schemes with dyes and pigments is endless.

What is Alumilite casting?

Alumilite casting is a process where the Part A & B resins are measured out by weight and mixed together. The resin mixture can then be left clear or dyes and pigments can be added. Once the resins are mixed, a molecular reaction starts and the mixture begins to generate heat. The heat that is created when resins are mixed together is known as thermosetting. Once the thermosetting reaction starts, it cannot be stopped. **Note:** It's very important to make sure that you follow the manufacturer's directions for mixing resins. Once the resins, dyes and pigments are mixed, the mixture is then added to a mold. The mold either contains a casting object or the mold is shaped to suit the final project. When the addition of the resin is complete, the casting is allowed to cure.There are other resins available for casting, such as Acrylic (Silmar 41 or Castin Craft) and Epoxy (West System). These resins do not behave in the same manner as Alumilite and should not be used in the same manner.

Safety

Safety glasses, safety boots, respiratory protection and gloves all need to be worn at the appropriate time as directed by the manufacturers recommendations to avoid personal injury to yourself or those helping. Please read and follow all instructions when dealing with hazardous chemicals as per the MSDS.

Tools and Equipment

- Pencil
- Compass
- Mixing Cups
- Paper Towels
- Latex Gloves
- Turning Tools
- Sanding Medium
- Casting Log Book
- Drop Sheet
- Acetone
- Aluminum Foil
- Level
- Pressure Pot
- Toaster Oven
- Wire Brush
- Mold
- Chuck/Faceplate
- Mixing Paddle
- Pigment Spoon
- Measuring Spoons
- Cordless Drill
- Bandsaw/Tablesaw
- Wax Paper
- Masking tape
- Oven Thermometer
- Timer
- Air Compressor
- CA Glue
- Accelerator
- Tape Measure/Rule
- Moisture Meter

Materials

- Wood
- Paper
- Pine Cones
- Chola Cactus
- Corn Cobs
- Coffee Beans
- Rice
- Pasta
- Brass
- Aluminum
- Sparkles
- Feathers
- Embedded objects

Preparation

- Drying – 200 F max. 0% moisture
- Cleaning – wire brush
- Stabilizing – Cactus Juice
- Material Sizing – depending on the project, everything from the mold size, resin quantity and pressure pot size need to be taken into account.

Vacuum – The absence of atmosphere creating a negative pressure. This pressure is generally expressed as inches of mercury (Hg).

Pressure – is expressed as pounds per square inch (psi) and is a measurement of the atmospheric pressure on an object in which it is distributed. It is derived from Pascal's Law or the principle of transmission of fluid pressure.

Resin Calculation

You can use rice, walnut shells or various mediums to fill in the voids and then transfer these mediums to a mixing cup and mark off the level of material for reference.

Dyes and Pigments

Dyes are an additive that colour the resins.

Pigments are additives that give the colours a pearlescent reflection of light, depending on the platelets that are reflected. (Metallic appearance)

Oil base paints provide a colour effect similar to dyes, except they do not bleed.

Mixing of these items is what makes the finished casting so unique in appearance and design.

The combination of these items is infinite and requires some form of documenting or recording. Each cast is a recipe and with record of it, it becomes difficult to create the same colour scheme or design. Therefore it is in our own best interest to create……The Casting Log Book

The Casting Log Book

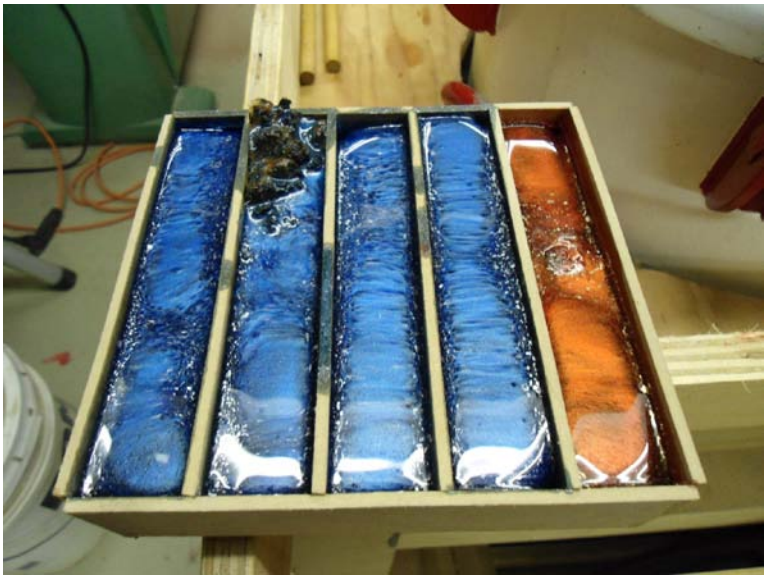
The single most important item you can have in your casting process. There can be a shop copy for recording each of your casts, as well as, an electronic for keeping all of the shop documentation and pictures. The Casting Log Book contains all of your critical information from the time you begin, up until the finishing process has been completed on each project. Every little detail can be recorded to make repeatable casting recipes for future references.

Resin weight	Mold type
Resin type	Mold material
Dye amount	Shop temperature
Dye type	Shop humidity
Pigment amount	Casting time in
Pigment type	Casting time out
Pressure psi.	Cast Results

Mold Making

Basic molds are broken into three types of designs, Solid Form, Cored or Hollow Form and Loose Form.

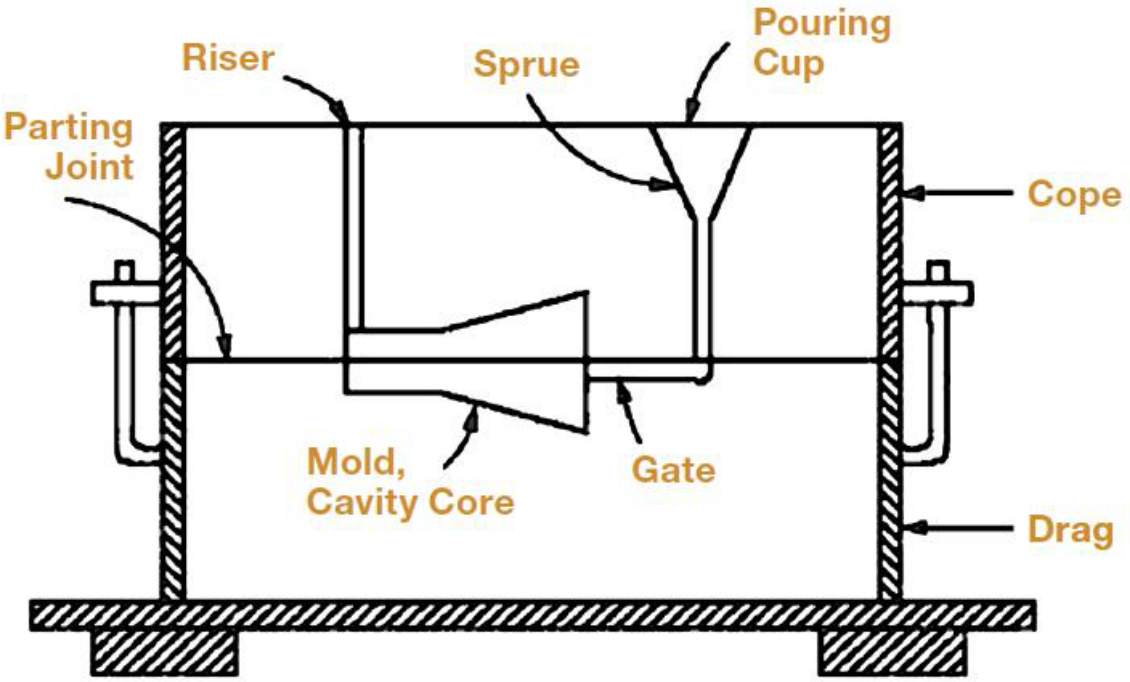
Solid Form - the core material is solid and held in place by means of an adhesive or a bridge material. The casting resin fills all of the voids. The simplest form of mold design.



Cored or Hollow Form - the mold consists of two or more pieces that follow the contour of the core material. The basic shape of the mold is similar to the shape of the core material. The casting resin flows through the mold to fill open voids. This is the most complicated mold form design and requires the most time to build.

Loose Form - the core material is allowed to float or remain suspended in the casting resin. Usually requires some sort of cap to prevent overflow of the resin and material.

Mold Design origin….sand mold.



<u>Mold Terms</u> – reference only

1. Pouring Cup
2. Riser
3. Sprue
4. Gating System
5. Mold Cavity
6. Core
7. Drag
8. Cope

The Casting Steps

These are the steps of casting that I follow and have been working well for me. For the purpose of this demonstration I will go through the steps to cast pen blanks in a group of five.

- Prepare the mold and casting specimens (pen blank pieces)
- Place the pen blank pieces in the mold and secure
- Place the mold in the oven to warm the casting specimens
- Choose a dye/pigment selection
- Determine the resin amount required
- Place the mixing cup on the scale and zero it out.
- By weight, pour Part A into the mixing cup, add the equal amount of Part B
- Mix the Parts A & B until they are clear, place the mixing paddle aside
- Add the dye and pigment selection
- Mix everything until completely blended, wipe off mixing paddle
- Pour the resin mixture into the mold cavity with the casting specimens
- Place the mold with specimens into the pressure pot
- Place the baffle plate over the mold
- Place the lid on the pressure pot, secure the lid
- Pressurize the pressure pot, not to exceed its rated capacity
- Clean the casting area and record the casting data in the Casting Log Book
- Allow the required time for the Alumilite Resin to cure under pressure

For clean up Acetone works well, but it can damage some surfaces and safety considerations should be looked at before using this product.

Resources

Alumilite

U.S.A.

Alumilite Corp. http://www.alumilite.com/

From the web site they offer a web search for suppliers locally

Canada

Woodchuckers http://www.woodchuckers.com/

Plastic World - http://www.plasticworld.ca/

Dyes and Pigments

U.S.A.

https://nurturesoap.com/3-soap-colorants

http://www.tapplastics.com/product/fiberglass/resin_fillers_dyes/tap_premium_pigments/50

http://shop.fiberglasshawaii.com/colorants

http://www.inlacebook.com/text/products/inlace-metallic-dyes.html

http://www.inlacebook.com/index.html

http://www.jacquardproducts.com

Canada

Woodchuckers http://www.woodchuckers.com/

Plastic World - http://www.plasticworld.ca/

Wyndham Art Supplies - http://www.wyndhamartsupplies.com/

Paints – Oil Based

Hardware Stores

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