

# Casting Turning Materials

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Creating materials for turning with Alumilite and Epoxy 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 Casting?

Casting is a process where the Part A & B resins are measured out by weight or volume 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. The resins available for casting are Acrylic, Epoxies and Alumilite products. These resins do not behave in the same manner and should be researched prior to use.

## 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 Logbook
- Drop Sheet
- Acetone
- Aluminum Foil
- Level
- Pressure Pot
- Toaster Oven
- Wire Brush
- Mold
- Chuck/Faceplate
- Mixing Paddle
- Pigment Spoon
- Measuring Spoons
- Cordless Drill
- Bandsaw/Table saw
- Wax Paper
- Masking tape
- Oven Thermometer
- Timer
- Air Compressor
- CA Glue
- Accelerator
- Tape Measure/Rule
- Moisture Meter

## Materials

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

## Preparation

- Drying – 200 F max. 0% moisture
- Cleaning – wire brush
- Stabilizing (if required) – 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 (Epoxy) 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 without a 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 Logbook



## The Casting Logbook

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 Logbook 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

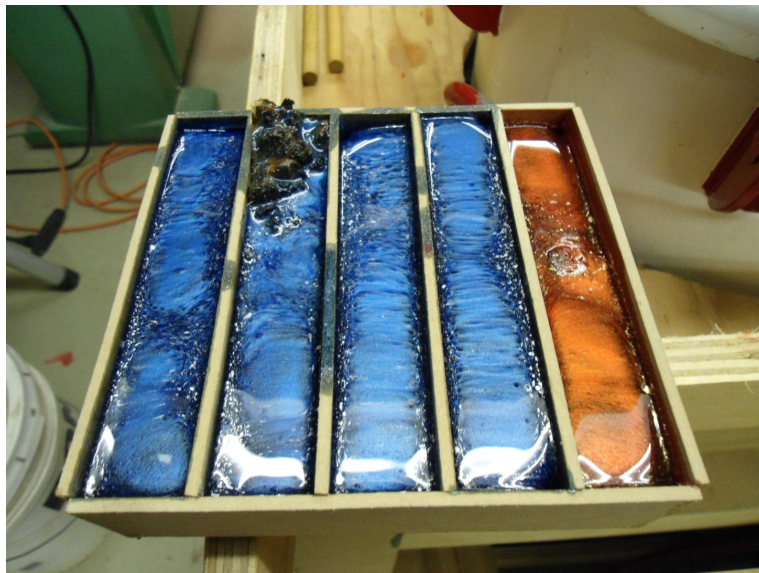
Pressure psi.

Cast Results

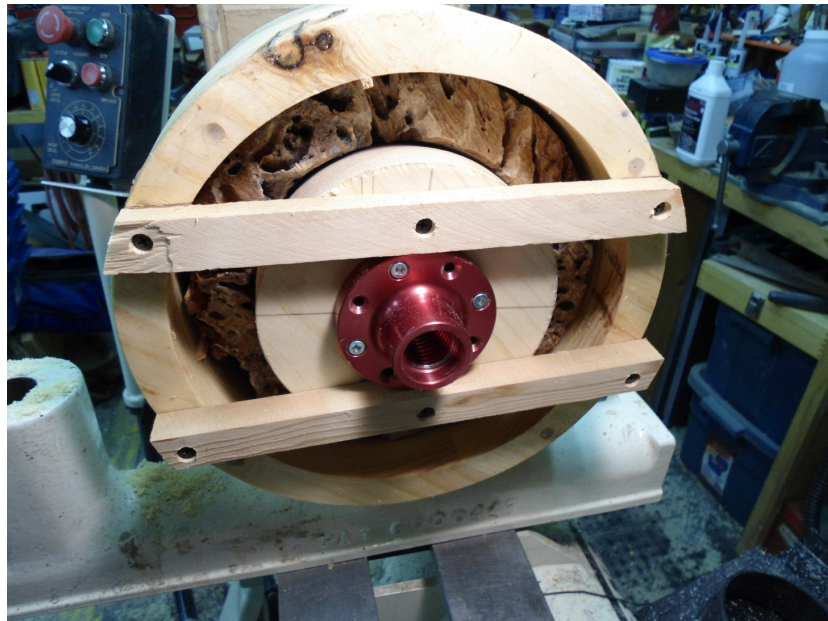
## Mold Making

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.

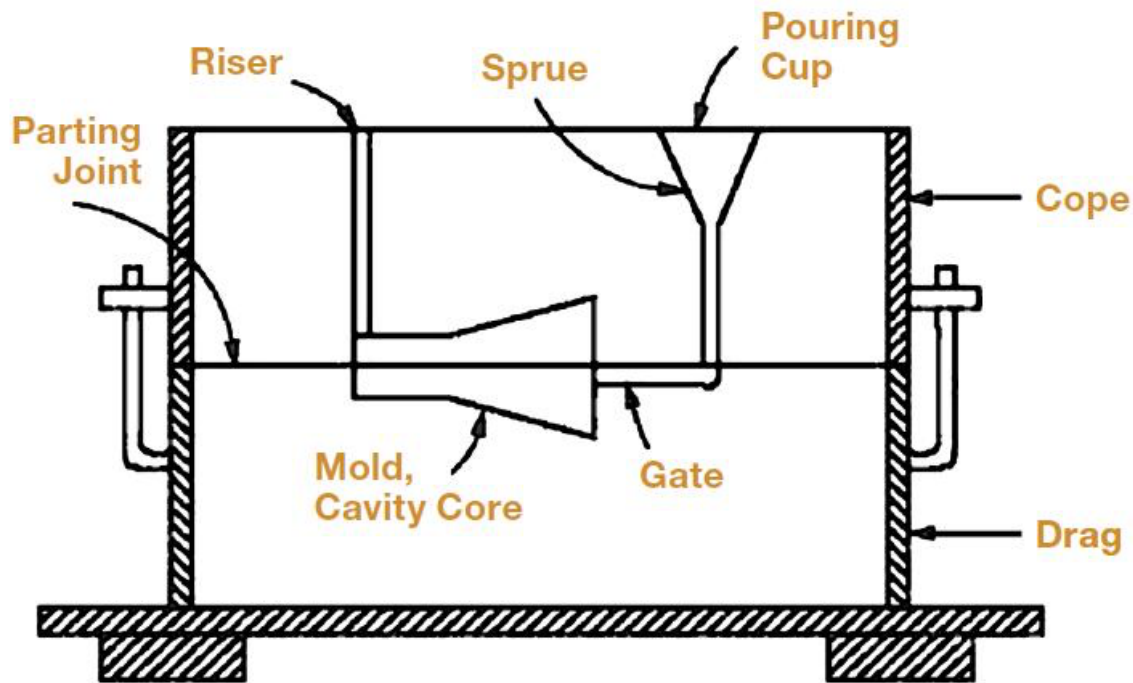




Loose Form - the core material is allowed to float or remain suspended in the casting resin. Usually requires some sort of cap to prevent overflow of the resin and material.



## Mold Design origin....sand mold.



### Mold Terms – reference only

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

## **The Casting Steps - Alumilite**

These are the steps for casting Alumilite 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 Logbook
- 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.



## **The Casting Steps – Epoxy**

These are the steps for casting Epoxy that I follow and have been working well for me. For the purpose of this demonstration, I will go through the steps to cast a table center piece.

- Prepare the mold and casting specimen
  - Place the mold in the oven to warm the casting
  - Choose a dye/pigment selection
  - Determine the resin amount required
  - Place the mixing cup on table.
  - By volume, 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 of the casting item
  - Allow casting to cure.
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- “OPTIONAL Steps” Place the mold into the pressure pot if necessary.
  - 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 Logbook
  - Allow the required time for the 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.

## The Pressure Pot

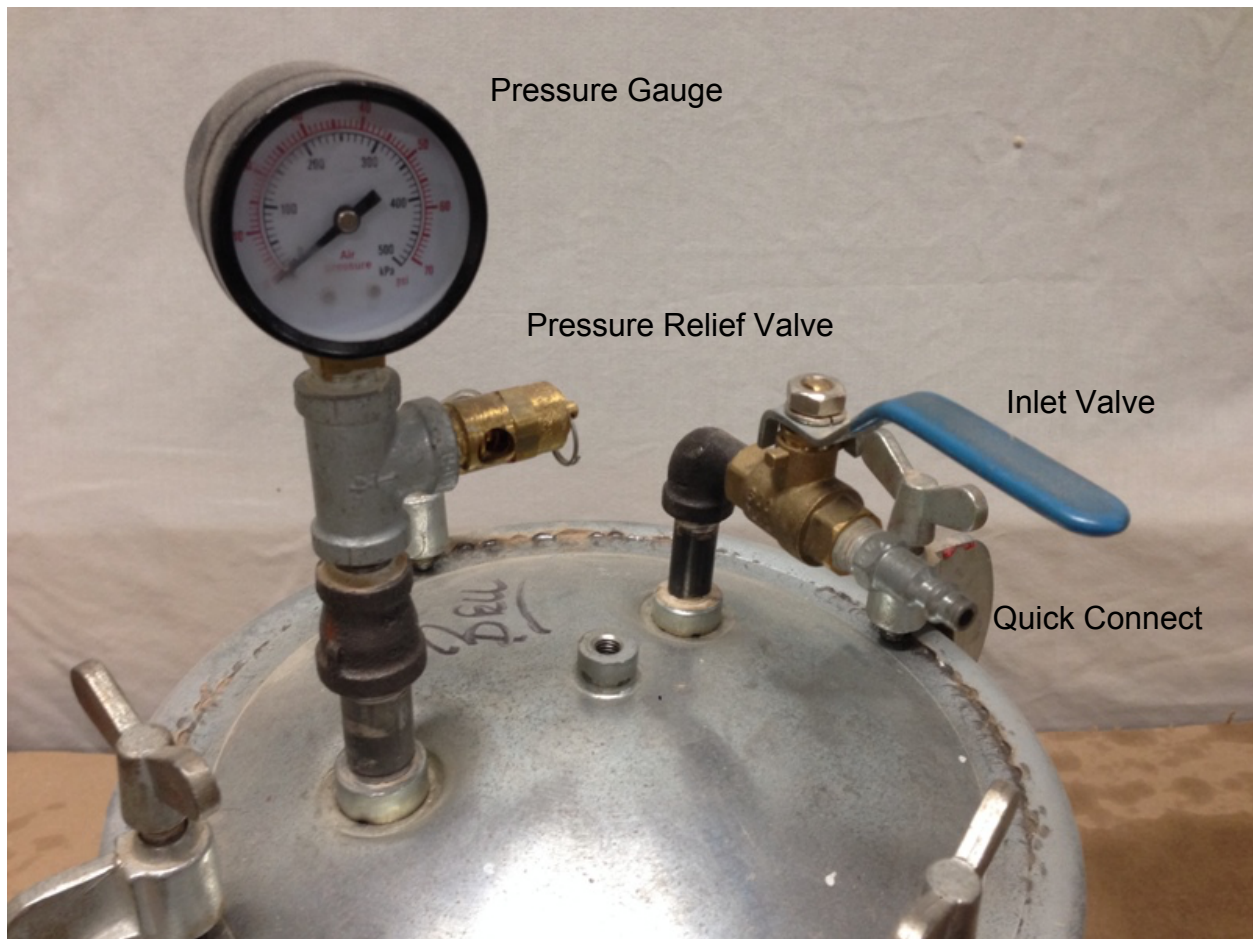
Remove the paint pipe inside the pressure pot to begin a proper Pressure Pot configuration.

Install the inlet valve and quick connect.

Pipe in a pressure gauge and Pressure Relief Valve (max. 60 psi).

Make sure to seal all of the pipe fittings with Teflon tape or the preferred Masters Pro Dope with Teflon.

Your pressure pot configuration should look like this.....





## **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>

<https://tkbtrading.com> (search Micas)

[http://www.tapplastics.com/product/fiberglass/resin\\_fillers\\_dyes/tap\\_premium\\_pigments/50](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/>

Currys - <https://www.currys.com>

## **Stabilizing Resin**

Turntex Woodworks - <https://www.turntex.com>

## **Paints – Oil Based**

Hardware Stores

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