**Casting Acrylic Pen Blanks**

**Molds:**

Pen Blank Molds can be made from a wide variety of materials including: High-Density Polyethylene Plastics (HDPE, e.g. Cutting Boards), PVC Pipe, Melamine or Silicone. In the class we are going to be using molds made from HDPE since they are relatively inexpensive and easy to make. In addition we will be spraying the molds with a releasing agent, [Stoner Urethane Mold Release](http://www.alumilite.com/store/p/960-Stoner-Mold-Release-12oz.aspx) or a Cooking Spray (e.g. PAM).

**Note**, *this is mandatory for Melamine molds, a convenience for HDPE or PVC molds, and not needed for Silicone molds.*

* Molds for class are 5 7/8” (L), 2 1/8” (W), 1 ¼” (H)
* Hold about 6 oz. of mixed resin
* Will make 3 x 5/8” blanks (perfect for 7mm pens) or 2 ¾” blanks

**Casting Agents:**

There are a number of casting agents available, including various types of: Epoxies, Polyester Resins, and Polyurethane Resins. In class we will be using [Alumilite Clear](http://www.alumilite.com/store/p/933-Alumilite-Clear.aspx) which is a 2-part Polyurethane Resin. It is a crystal clear resin that is easy to use and perfect for a wide variety of clear casting applications. It's low viscosity and 1:1 mix ratio by weight makes it extremely easy to use. Pressure is recommended to achieve 100% bubble free castings but minimal bubbles can be achieved by slowly mixing and pouring the resin. It offers superior polishability than other clear resins and you are able to achieve maximum shine in your finished parts.

**Coloring Agents:**

We will be using 2 types of coloring agents for our casting:

1. [Pearl-x Mica Powders](http://www.amazon.com/Jacquard-Pearl-Powder-Pigments-32-Color/dp/B000BGSZFU)
2. [Alumilite Dyes](http://www.alumilite.com/store/p/1012-Alumilite-Dye.aspx)

**Fillers:**

One of the great things about casting your own acrylic blanks is that you can be very creative and add various fillers to the casting. Search on YouTube for [Casting Alumilite Pen Blanks](https://www.youtube.com/results?search_query=casting+alumilite+pen+blanks+) and you will find hundreds of videos with lots of great ideas. Another great source of inspiration and advice is the [International Association of Pen-turners (IAP)](http://www.penturners.org/forum/f43/).

**Note:** *It is critical that anything you add as filler have r no moisture content (e.g. no green wood) or the PolyUrethane resin will react with moisture and create foam. Consider drying out this type of filler in a dedicated toaster oven (225F until bone dry, and then let cool) or even taking it through the stabilization process to insure there isn’t an unexpected reaction.*

Some examples of fillers include:

* Stabilized Coffee Beans Liquid Amber – Seed Balls
* Burl caps Metallic Confetti
* Worthless wood – save your scraps Cutoffs from previous castings
* Scrubbing Pads Luffas

**Casting Supplies:**

* Covering for your work surface Paper towels
* Alumilite Clear Resin, Part-A and Part-B Accurate scale (to at least .1 gram)
* Nitrile Gloves Eye Protection
* Clear Mixing Cups Silicone Spatula or Popsicle Stick for mixing
* Mold Mold Release Agent
* Coloring agents (e.g. Dyes and Powders) Small spoon or stick for adding powder
* Pressure Pot (highly desirable) Toothpick

**Préparation:**

1. Cover work surface
2. Put on Gloves and Eye Protection
3. Make sure mold is clean and edges are well sealed.
4. Spray mold with *Stoner Urethane Mold Release* or *Cooking Spray*
5. Select coloring agents
6. Put mixing cup on scale and zero it out.
7. Mentally plan your casting process – ***Working time is only 7 minutes***

**Casting a 2 color blank:**

1. Measure 3 oz (by weight) of Alumilite Clear Resin, **Part-B** into a mixing cup
2. Measure 3 oz (by weight) of Alumilite Clear Resin, **Part-A** into a separate mixing cup.
3. Carefully pour **Part-A** into **Part-B,** *use spatula to get all of* ***Part-A*** *from glass***.**
4. **Clock starts ticking at this point. Work quickly and carefully.**
5. Use spatula to mix the two parts together – ***treat it like a soufflé and stir gently to avoid introducing any additional bubbles.***
6. Make sure you mix the two parts thoroughly, scraping sides and bottoms. ***Look for the mixture to turn from cloudy to clear.***
7. Pour off about 1 oz of the mixture into a separate cup – *this will be the secondary color*
8. **Primary color** -- Add dye (*5-6 drops should be sufficient)* or powders (*small scoop – a little goes a long way)* to the larger glass of resin. **Gently mix – avoid adding air bubbles.** Adjust color intensity as needed.
9. Gently pour into one corner of the mold, use spatula to get all the resin out.
10. Lightly tap mold to help eliminate any air bubbles.
11. **Secondary color** -- Add color to the remaining resin (*1 drop of dye or small amount of powder* should be sufficient) and gently mix. Adjust color as needed.
12. **Drizzle** secondary color into mold—use a toothpick to accentuate the swirl of colors.
13. **Let sit (*or put into a Pressure Pot)* – Casting should be cured in 2 hours.** ***Note:*** *This is an exo-thermic reaction and expect the mold to get hot to the touch.*

**Casting with a filler:**

1. Exact steps will vary greatly based on the filler used. Consider:
	1. Will the items float? *Plan to use a lid for the mold or secure items somehow (CA, screws etc.).*
	2. If using a lid, think about how much room you need to leave in the mold for it so the resin doesn’t leak out.
	3. How bulky are the items? *Reduce amount of resin mixed or have a backup mold you can pour the excess into.*
2. Place filler in mold – arrange as needed.
3. Measure 2-3 oz (by weight) of Alumilite Clear Resin, **Part-B** into a mixing cup
4. Measure 2-3 oz (by weight) of Alumilite Clear Resin, **Part-A** into a separate mixing cup (*Part-A and Part-B* ***must*** *be equal by weight)*.
5. Carefully pour **Part-A** into **Part-B,** *use spatula to get all of* ***Part-A*** *from glass***.**
6. **Clock starts ticking at this point. Work quickly and carefully.**
7. Use spatula to mix the two parts together – ***treat it like a soufflé and stir gently to avoid introducing any additional bubbles.***
8. Make sure you mix the two parts thoroughly, scraping sides and bottoms. ***Look for the mixture to turn from cloudy to clear.***
9. **Primary color** -- Add dye (*4-6 drops should be sufficient)* or powders (*small scoop – a little goes a long way)* to the larger glass of resin. Gently mix – avoid adding air bubbles. Adjust color intensity as needed.
10. Gently pour into one corner of the mold, use spatula to get all the resin out.
11. Lightly tap mold to help eliminate any air bubbles.
12. **Let sit (*or put into a Pressure Pot)* – Casting should be cured in 2 hours.** ***Note:*** *This is an exo-thermic reaction and expect the mold to get hot to the touch.*

**Unmolding and Cutting:**

1. Blank should come free from mold after several hard taps. If it doesn’t, unscrew 1 end of the mold to get better access to release it.
2. Mold can be cut on a table-saw or band-saw as desired.
3. For 7mm pens, you should be able to get 3 x 5/8” blanks.
4. Alternatively you can get 2 ¾” blanks with some scrap leftover that you can easily re-use in another blank.