

# High Strength 3

## Silicone Mold Making Rubber

**Product Description:**

Alumilite's High Strength 3 silicone mold making rubber is our most flexible silicone mold making rubber and is great for making molds of parts with deep undercuts or negative drafts. The High Strength 3's flexibility and high tear strength give it the ability to reduce seam lines by making one piece molds rather than multiple piece molds where seam line removal is critical. The High Strength 3 is a tin base silicone and cures against all different types of clay and substrate. The tin base silicone is a condensation cure and therefore temperature and humidity may affect the cure speed of the rubber. The High Strength 3 has a low viscosity which does not require degassing (always recommended when available) and will pick up the exact detail of your original.

**Physical Properties:**

Color	Pink
Mixed Viscosity (cps)	15,000
Hardness, (ASTM D-2240) Shore A	8-10
Specific Gravity	1.15
Linear Shrinkage	.3%
Tensile Strength (ASTM D-638) (psi)	400
Elongation (in/in)	575%
Temperature Range (Degrees F)	-67 to 395
Tear Strength (ppi)	115

**General Properties:**

Color	"A" Side - Base	White
	"B" Side - Catalyst	Translucent Pink
Mix Ratio		10:1 by wt.
Shelf Life		6 months
Open Time at 75 Degrees F (100g mass)		45 minutes
Demold Time at 75 Degrees F (100g mass)		12-18 hours
Full Cure Schedule		7 days

	<u>Approximate Volume:</u>	
<b>Packaging:</b>	1 lb	Pint Kit
	5 lbs	½ gallon
	10 lbs	1 gallon
	50 lbs	5 gallon
	484 lbs	Drum

**Safety:** Read complete labels, SDS, and technical data sheet including instructions before using.

## Instructions

**Keep materials out of the reach of children, do not take internally, and do not use in any way other than it's intended use.**

### **Before Starting**

Make sure your work area is appropriate for measuring, mixing, and pouring mold making materials as they can and will stain any porous materials such as carpet and clothing. Also make sure to use and store materials in an area where children cannot reach or access.

### **1. Mold Preparation**

Before measuring, mixing and pouring your mold, there are a few things you can do to ensure a good mold.

Thoroughly clean and remove all dirt/contaminates. **Make sure mold box and part are sealed to eliminate the possibility of leakage or silicone wicking into the part.** The silicone will leak out of any small crack in your mold box and it is imperative that you make sure your mold box is sealed prior to pouring. If your mold box does leak, try using hot melt, super glue/accelerator, clay, tape, or any other material to try to stop the leak. This is not an easy task, as it's like trying to stop an oil leak, which is why it is so important to double and triple check your box is sealed prior to pouring your mixed rubber.

Mold release is required when pouring against another silicone if you do not want the two to bond, as when making two piece molds. Use Alumilite's UMR in combination with Rubber to Rubber Mold Release or a thin layer of Vaseline are adequate to avoid the two pours of High Strength from bonding to one another. Avoid contact with all porous materials such as fabric, clothing, carpet, and other non sealed materials as the High Strength will wick in, bond, and attach itself to those porous materials.

Make sure that your master is fastened securely to your mold base to prevent it from floating.

### **2. Calculating Material Needed**

There are approximately 21 cubic inches volume per 1 lb of silicone rubber. Therefore, to calculate your needed material find the area of your mold box minus the area your master in cubic inches.

An easy to use calculator is available at <http://www.alumilite.com/store/pg/12-Volume-Calculator.aspx>

### **3. Mix Ratio**

The mix ratio of the High Strength series silicone rubber is 10:1 by WEIGHT. A gram scale with an accuracy to the nearest 1 gram is recommended. Over or under catalyzing the High Strength series mold making materials may affect the open time, demold time, cure, and physical properties.

It is not recommended to mix by volume other than using in the 1 lb kit size, in which we provide and have instructions to mix two fluid ounces of base to 1 scoop of catalyst (cups and scoop are provided in the kit).

### **4. Open Time**

Open time of the High Strength series mold making rubbers are 45 minutes. Demold times vary from 12-18 hours. Relative humidity and temperature will affect the cures speed. The more humid and warmer the environment is, the faster it will cure. Temperature alone will not accelerate the cure of the High Strength series rubber or any other tin base silicone. Moisture/humidity is also required.

### **5. Measuring and Mixing**

Make sure to use a big enough container which gives you plenty of head space to thoroughly mix the rubber. If you are planning to degas/vacuum the silicone, be sure to use a container that is approximately 2-3 times the liquid amount of rubber you plan to mix. This will allow the rubber to expand/grow in the container without over flowing into your vacuum chamber. Allow silicone to rise and collapse under full vacuum to ensure you've removed all air introduced during the mix process.

Once the base and catalyst have been measured to proper mix ratio in your container, you are ready to start mixing. Mix THOROUGHLY. Scrape sides, stick, and bottom multiple times to ensure you have effectively mixed all of the base with all of the catalyst. When you think you have it completely mixed, repeat the process and mix it again. Mixing should take a good 2-3 minutes. The High Strength series of mold making rubber has plenty of open time which allows you the time necessary to make sure you have mixed it thoroughly.

Once mixed, degas if you have the ability to. Degassing will remove the air introduced while mixing. Although not required, it is recommended to remove any air as your mold will be more dense, perform better, and theoretically last longer if it does not have any air inside of it.

### **6. Pouring**

Once the material is thoroughly mixed, pour the mixed rubber slowly in one corner of your mold box and allow the rubber to flow slowly and naturally around your master. This process allows the rubber to roll over your master avoiding air entrapment. Avoid pouring the rubber directly over or onto your master.

#### **7. Eliminating and Avoiding Air Bubbles**

If you do not have the capability to degas, there are a couple of techniques that will help ensure air will not become trapped against your master and show on your mold surface. First, is once you've mixed your rubber, brush an initial skin layer the mixed rubber over your master using a disposable paint brush. This will ensure the rubber wets out the surface of your master and not allow air to stick or hold onto the surface forcing any air bubbles to float up and away from your master. Once the surface has been coated/wetted out, hold your mixed rubber high above one corner of your mold box and pour a small thin stream of rubber and slowly fill the mold box. The thin stream will stretch/pop any air bubbles as you pour. As the thin stream fills the mold box, the skin coat you painted onto your master will prevent any air from sticking to the surface of your mold.

#### **8. Storage & Shelf Life**

Store in a cool dry place. Unopened containers will have a shelf life of 6 months when properly stored at room temperature. Avoid high humidity areas and replace lids to containers as soon as you are finished using. If you are finished using the product for a period of time, purge opened containers with dry nitrogen or Alumilite's Bloxygen before re-sealing and storing.

#### **9. Mold Release**

The High Strength series silicone has a very high tear strength and ability to bond to itself. Therefore, when making a two or multiple piece mold when you are pouring new High Strength over cured High Strength it is imperative to use a minimum of 4-5 coats of Rubber to Rubber Mold Release, a thin layer of Vaseline, or a combination of Rubber to Rubber and UMR. UMR alone will not always release the High Strength series because of its incredible tear strength and ability to adhere to itself.

#### **10. Mold Life**

Mold life expectancy is a variable of many different factors including but not limited to the type of resin being used in the mold, the length of time the resin is in the mold, the exotherm of the resin, cycle times, the design of the part, the intricacies of the detail, the force needed to demold, etc. Even with all of these factors, there are some things you can do to get the most life out of your molds. In no particular order, here are some of the ways to extend the life of your molds. Use mold release such as Stoner or UMR. Avoid leaving castings sit in the molds any longer than they need to (especially overnight). Allow molds time to cool from peak resin exotherms prior to pouring the next part. Use Silicone Oil to condition molds whenever you stop production for a day or two as well as condition molds with Silicone Oil prior to storing for periods of time. Integrate a bake out process of 400 degrees for 2 hours and allow to cool back down prior to running more parts every 25% of the expected mold life (this process will draw silicone oil back to the surface of your mold rejuvenating what has been lost or depleted from the casting process). Store molds in a clean and dry environment.

The following are estimates done with the use of a mold release using Alumilite resins. High Strength 3: 50-75, High Strength 2: 40-60, High Strength 1: 30-50.

#### **11. Work Area & Clean Up**

Mixed High Strength rubber will absorb into porous materials and may stain! Avoid clothing, carpet, upholstery, and any other porous materials which will stain and will not come out. Mold making and casting is best done in a designated work area such as a basement, garage, or hobby room with adequate air movement or ventilation. Cover any surfaces including floors with plastic sheeting, cardboard, or plywood to prevent damage from spilled resin. To clean up unmixed or still liquid material, use rubbing alcohol on a rag or paper towel to quickly clean and remove. In some instances, such as spills on non-porous surfaces, it's easier to clean up silicone after it's allowed to cure. Then simply peel away and discard.