

Flex Series

Flexible Urethane Elastomers

Product Description:

Alumilite's entire line of Flex systems ranges in hardness from soft and flexible (20A) for automotive, medical, and gasket applications all the way to very hard durometers (80A) used for industrial rollers, nests, fixtures, and bumpers in a wide variety of industries. The Flex line of urethane elastomers are extremely tough, yet extremely easy to use. The low viscosity of the Flex systems allows for excellent detail and part reproduction. Although vacuum or pressure assistance is highly recommended for casting bubble-free/dense parts every time, it is not required when pouring simple parts where small bubbles will not cause an issue. The materials feature a 4-minute work time and a demold time of 2 hours at room temperature (depending on mass). Post curing the parts at 120-150 degrees F will accelerate the cure and demold time. The full cure is 72 hours. Alumilite's Flex series are also great for making flexible rubber molds for resin, concrete, plaster, silicone, and more. Mold release is required when using the Flex line to ensure the Flex systems do not bond when poured in any type of mold other than silicone rubber. When pouring into silicone rubber tools, mold release is not required but still recommended to prolong the life of the silicone rubber mold.

Product	Natural Color	Mixed Viscosity	Shore A Hardness	Tensile Strength	Elongation %	Tear Strength
Flex 20	Translucent Yellow	520 cps	20A	250 psi	770%	50 ppi
Flex 50	Translucent Yellow	550 cps	50A	250 psi	200%	55 ppi
Flex 60	Translucent Yellow	625 cps	60A	345 psi	235%	95 ppi
Flex 70	Translucent Yellow	680 cps	70A	730 psi	175%	150 ppi
Flex 80	Translucent Yellow	1600 cps	80A-85A	1332 psi	250%	145 ppi

General Properties:

Color	"A" Side "B" Side	Slight Yellow Brown
Mix Ratio		1:1 by wt.
Shelf Life		1 year
Pour Time at 75 Degrees F (100g mass)		4 minutes
Demold Time at 75 Degrees F (100g mass)		2 hours
Full Cure Schedule		72 hours

*Mix by
Weight
only*

Packaging:	28 oz	1 lb. A/1 lb. B
	16 lbs.	8 lbs. A/8 lbs. B
	80 lbs.	40 lbs. A/40 lbs. B
	Drum Kit	400 lbs. A/400 lbs. B

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

Instructions

Keep Alumilite 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 casting resins that 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 mixing and pouring the resin into your mold to achieve a cast resin piece there are a few things you can do to prepare your mold that will greatly enhance the physical properties and curing of your cast resin piece.

The first thing you can do is to preheat your mold. Warm the mold in a conventional oven at 120-150 degrees F for 15 minutes or warm your mold in a microwave for 1 minute/lb. of rubber on high. This will only warm your mold and will not affect the microwave or your mold adversely. It will, however, help the thin sections of your casting cure more evenly with the larger sections of your part and reduce your demold time. It will also help the resin set up uniformly to give you a consistent fully cured cast piece. (It is highly recommended to warm your molds when using the Slow Set, Water Clear, Clear, Flex, Amazing Clear Cast, or parts under a 1/2" in thickness to ensure proper curing.)

Note: Do not microwave when there is resin in the mold, if you have painted your mold, or if you have already coated the mold with the Metallic Powders.

2. Eliminating and Avoiding Air Bubbles

To release surface tension and help with minimizing unwanted air bubbles in difficult to fill areas, baby powder your mold prior to casting. Painting or sprinkling baby powder on all the surfaces inside your mold will greatly reduce the amount of surface tension in the mold. As the resin flows into the mold it will physically pick up each particle of the baby powder and help bubbles release from the surface of the mold allowing them to float to the top and escape. The powder will not change the appearance of your casting. Since the resin picks up and absorbs the baby powder, the white color of the powder will not show up in your finished piece. If you have a small paintbrush, simply paint in the baby powder and knock out the excess before casting your part. (Baby powder not recommended when pouring clear parts.)

Warming your mold and baby powdering it prior to casting your piece will greatly enhance the physical properties and appearance of your cast piece by helping it cure properly and aiding in the prevention of air entrapment.

3. Mixing

Before mixing, shake both sides and allow them to set for approximately 15 minutes prior to measuring.

This makes sure nothing has separated during storage and allows time for the air introduced while shaking to escape before mixing. Make sure you know the proper mix ratio of the material you are using. Double-check the mix ratio. The mix ratio of the Flex Series urethane elastomers is 1:1 by weight only. Varying the mix ratio of Alumilite resins will alter the cure and negatively change the physical properties and is NOT recommended. Alumilite resins have been formulated to crosslink completely and altering the mix ratio may leave uncured components in your cast piece that could come out at a later time.

We recommend you mix at least 20 grams of each side to ensure you have a proper mix ratio. If you measure out smaller amounts and pour the A into the B you will be off ratio due to the residue left in the A side cup. In larger amounts of resin batches, this will not be enough to throw off the mix and cause an issue with the resin setting up. But with small amounts of resin below a fluid ounce, this will affect the mix ratio and will typically result in parts that appear darker in color, never reach full hardness, or reach their full strength.

Once the materials have been measured accurately on a scale, mix fluently (keeping the stir stick in contact with the bottom of the cup - reduces air from being introduced into your resin) for approximately 25-45 seconds. Make sure to scrape the sides and the bottom of the mixing cup.

4. Degassing

As soon as you have thoroughly mixed the resin, you are ready to degas. Although not required with the Flex Series, it is highly recommended to achieve the full properties including tear strength and hardness. Degas the mixed Flex until the material has risen and collapsed under full vacuum. Once the Flex begins to clear up in the vacuum chamber, remove it and prepare to pour.

IF you do not have the ability to degas ... mix slowly and thoroughly and avoid introducing air into the system before pouring. Too much air as well as moisture in the system can create parts that are full of air and crumbly.

5. Pouring

Once the material is thoroughly mixed and degassed, pour the resin slowly down the side of your mold cavity. Tilting your mold will prevent the resin from splashing in the bottom of your mold and creating unwanted air bubbles that would then need to find their way to the top of the mold. Similar to tilting your glass as you pour a beverage rather than letting it splash/cavitate off the bottom creating air bubbles.

Squeezing the brim of the cup to form a point allows you to pour a smaller/slower stream of resin into your mold controlling the flow and reducing the chance of unwanted air bubble entrapment against the surface of the part.

If your mold has undercuts, pour enough resin into the mold to fill it halfway. Then, tilt and rotate the mold in the opposite direction of the undercut to allow the air to escape up the side of the mold. Squeezing or burping the mold at the same time will also help relieve the air trapped in the undercut and allow the bubbles to release from the mold surface. Once you see air bubbles come to the surface of the resin and you can be confident you have removed the air from the undercut, simply top off the mold by pouring the remaining resin into the mold.

6. Open Time

Alumilite Flex Series Resins have an Open Time of 5-7 minutes at 75 Degrees F (100g mass). Larger amounts of mixed resin will shorten your work time. Warmer ambient room temperature will also shorten work time. To increase the open time of the Flex Series resins, simply chill the “A” & “B” sides of the Alumilite in the refrigerator or in a bucket of ice for approximately 30 min. before pouring. This will increase the open time of the Flex by approximately 1-2 minutes. When cooling your resin, we highly recommend preheating your mold to ensure a proper cure.

7. Post Cure

Post curing the Flex is highly recommended to ensure the material cures fully and properly. Post curing the part in the mold for 1-2 hours at 120-130F for 2-4 hours. This is especially important when casting small or thin parts.

8. Color - Dyes & Painting

Alumilite Flex Series urethane elastomers can be dyed or pigmented using non-water base dyes. Alumilite offers a line of translucent dyes in standard colors that react/crosslink chemically with the resin to achieve beautiful colored resin cast pieces with no worry of leaching or color ever coming out of the cured piece. The dyes are extremely concentrated and color the Flex Series extremely easily. A maximum of .5% into the A side is needed to completely color the Flex Series. We do not recommend preloading the dye into the A side as it can affect the shelf life of the Flex Series casting rubbers. If you are looking to use a dye, pigment, or filler that you have not used before, we highly recommend making a small test sample to ensure compatibility before using or preloading into the resin.

Painting can be achieved but requires a flexible paint that won't crack when your cast part flexes and is best if painted immediately after demolding while the resin is still curing. Once the resin has completely cured and hardened up, paint adhesion is not as strong. Most flexible paints will still bond but may scratch off easier if not applied while the resin is still curing. Another option is to paint your silicone rubber mold, allow the flexible paint to dry, and then cast your resin into the mold. The Flex Series resins will chemically bond to the dry flexible paint, and once the resin cures you will demold a perfectly painted piece that moves and flexes as the part does.

9. Mold Release

To achieve maximum parts out of your silicone molds or to ensure release out of non-silicone molds (aluminum, urethane elastomers, latex, or any other substrate), we recommend using Alumilite's Stoner Urethane Mold Release. This offers maximum release and puts an effective layer of release on non-porous surfaces to release Alumilite Casting Resins. When using the Stoner Mold Release, some release will transfer to the cast resin part after demolding and may interfere with the ability to paint or bond the cast resin piece. A mild solvent wash and perhaps even some mild abrasion may be required to remove the Stoner from the casting.

Alumilite does offer a “Paintable” mold release called UMR. UMR can be used as a release between silicone to silicone, urethane to urethane, silicone to urethane, and much more. It is an all-purpose mold release that does not interfere with painting unless excessive amounts are used and transferred to your casting.

10. Shelf Life

The shelf life of the Flex Series urethanes is 1 year in an unopened container but a much longer shelf life can be expected even after being opened as long as it is sealed and stored in an area free from moisture contamination (humidity and changing of temperatures such as a garage).

11. Storage

Store the Flex materials at 70 degrees F or above in a dry location. Cold temperatures and moisture will thicken the B Side. If the B side thickens, safely warm the B side up to at least 100 degrees F and shake to bring the material back to its proper viscosity. Once it cools down, it is ready to use. One way to warm the material is to place the bottle over or near a register to bring the temperature up being sure not to overheat or melt the container. Another is to place the closed bottle in a pot of water and slowly bring the temperature of the water up until the B side can be shaken and brought back to its original viscosity. Do not microwave.

12. Moisture Contamination

Relative humidity or moisture will react with the B side (iso) of the Flex Series rubbers and crystalize. You may notice crust, crystals, or chunks around the tip or cap or at the bottom of the bottle. If the B side shows signs of moisture contamination, you may need to strain the chunks or crystals with a paint filter or screen to remove them from the resin. Once strained, the B side can be used as normal. However, if the A side has been contaminated by moisture, it will not show any signs of contamination until you cast your piece in which you will notice an excessive amount of bubbles or perhaps even a froth or foam on the top side of your casting. Once the polyol side (A side of Flex) has been contaminated with moisture it is extremely difficult to restore. Vacuuming the resin for a long period of time may vaporize and pull the moisture out or a molecular sieve can be mixed in and allowed to react and settle to the bottom with some success.

The absolute best solution to place caps and lids back onto the containers as soon as you are done measuring the material you need to pour and storing in an environmentally controlled space that contains low humidity.

13. Work Area & Clean Up

Mixed Alumilite resins will absorb into porous materials and will stain! Avoid clothing, carpet, upholstery, and any other porous materials which will stain and will not come out. Resin 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. Once cured, the resin is extremely durable and chemical resistant and nearly impossible to remove. There are a couple of solutions out in the market that claims to dissolve cured urethanes. If you require such material, please call us and we can refer you to some possible solutions.

14. Warranty

NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, IS MADE CONCERNING THE INFORMATION HEREIN PROVIDED OR ANY RELATED PRODUCT. The user is responsible for determining whether the Alumilite product is fit for the user's particular purpose and suitable for user's use or application. Given the variety of factors that can affect the use and application of an Alumilite product, the user must determine the suitability of the product for its intended application, and the user assumes all risk and liability for safe use of the product. Alumilite's liability is limited to product replacement only after review/testing of the product alleged to be defective that is returned to Alumilite in accordance with Alumilite's Shipping and Returns Policy. In no event shall Alumilite be liable for punitive, consequential or indirect damages or damages in excess of the purchase price of the product.