

ALUMILITE CORP.

Molding & Casting Materials

Casting Manual



Manual Contains:

- Super Kit Instructions
- Usage Calculations
- Detail How To Information
- Moldmaking & Casting Tips
- Frequently Asked Questions
- Material Safety Data Sheets (MSDS)

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ALUMILITE'S

Super & Mini Casting Kit

Product Introduction

AlumiRes Casting Resin - Two part liquid casting plastic used to cast perfect replicas of your original, hard tools, nests, fixtures and more. Before using, shake the "B" side of the resin. Measure equal amounts of the "A" side and "B" side and stir until a uniform color appears (approx. 30-40 seconds). Pour promptly into your mold. The open/work time of the resin is 2-3 minutes in which it starts to harden. Chill the resin to increase the work time. Close containers immediately after using to avoid moisture contamination. Moisture in the resin will cause random pits and/or miniscule air bubbles throughout your part. Altering mix ratio will cause the resin to cure improperly and physical properties of the casting to diminish.

Quick Set Moldmaking Rubber - General purpose moldmaking rubber that picks up exact detail of your original. Great for making simple one and two piece molds. Before using, shake the Catalyst well and stir the Base well to ensure the oil has not separated. The mix ratio is 10 parts Base to 1 part Catalyst by weight. You can also use the 1 oz. cups and scoop to measure the base and the catalyst (available in the 1 lb. units). To use the cups and scoop, measure 1 scoop of Catalyst for ever 2 ounces of Base. Mix thoroughly, then pour into your mold box to encapsulate your original. Demold time will be approximately 8-18 hours depending on temperature, humidity, and altitude.

Moldmaking and Mixing Supplies - Clay - Use to clay up half of two piece molds and to seal your mold box. **Mold Release** - Use between two halves of rubber mold to prevent first half from sticking to the second and to help reduce surface tension between cured mold and cast pieces. **Sticks & Cups** - Help to properly measure and mix rubber and resin. **Alumilite's Casting** available online, gives you detailed instructions and techniques for making your casting project a success. (Downloadable on the Super and Mini Kit product page.)

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Making a One Piece Mold

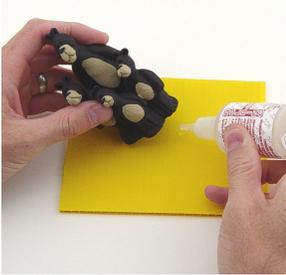
A one piece mold is recommended when there is a flat side to the original that is not cosmetic, even when undercuts are present.



1. The first thing you must do is to determine what you are going to make a mold of. Whatever you choose, make sure it is in perfect condition. The moldmaking rubber and casting resin will pick up every little flaw that is in the original and will duplicate it in the mold and casting.



4. Measure and mix the silicone rubber according to the instructions provided with the silicone. Once mixed thoroughly, slowly pour the rubber from one corner of your mold box allowing the silicone to flow naturally around your piece. (we have chosen to use High Strength 2 due to the large undercuts - bear's chins)



2. Fasten the flat side of your original to a piece of plastic or wood using glue, clay, double sided tape, or super glue. This will prevent the original from floating after you pour the silicone moldmaking rubber over it. The flat side will give you a nice open area to pour in.



5. Let the rubber cure (typically takes overnight). Once the rubber has hardened, begin demolding the original. If you can not disassemble the box itself, use a dull knife or spatula to remove the mold. Rubbing alcohol helps by releasing the surface tension and making the silicone slippery.



3. Make a mold box out of plastic, wood, metal, posterboard, pvc, or any other cup or container. Leave .25"-.375" between your mold box and your original. Seal your mold box with Alumilite's Synthetic Modeling Clay to prevent the mixed silicone rubber from leaking out of your mold box before it cures.



6. Once the mold has been removed from the mold box, flex the cured silicone mold and remove your original. You now have a perfect mold of your unharmed original. You are now ready to make identical castings of your original.

Casting

Before mixing the resin, preheat your mold to ensure proper curing of the resin casting. Place the rubber mold in a microwave for a minute on high or place the mold in a conventional oven for 30 min. at 150F. The other helpful hint in making flawless castings is to powder the inside of your mold with baby powder. The baby powder will release the surface tension and decrease the chance that air bubbles will get trapped. Prior to casting make sure you blow or knock out all excess powder from the mold.



1. Measure the Alumilite resins according to their proper mix ratio (generally 1:1 by wt or volume). Mix vigorously for 20-25 seconds until thoroughly mixed.

Use plastic or paper cups when mixing Alumilite resins. (do not use Styrofoam cups)



3. The open time of most Alumilite resins is 90 seconds. The color change is the end of the open time and the point in which it begins setting up. The finished color of Alumilite Regular is an opaque tan (white and black resin is available along with coloring dyes to color the resin yourself).



2. Once you've mixed the material thoroughly by scraping the sides and the bottom, slowly pour the resin into your warm mold by tilting it and letting the resin flow down the sides of the mold. Squeeze and tap the mold to assist any unwilling air bubbles to release from the sides of the mold and to help them float to the surface.



4. Once the resin has hardened (approx. 5 minutes), flex the mold and remove your perfectly cast piece. Your piece is now ready to be sanded, painted, tapped, machined, etc.

You are now ready to mix up more Alumilite resin and cast your next perfect replica of your original.

For more detailed How To's Please visit www.alumilite.com

Making a Two Piece Mold



The first step is to create or select your original. Your original can be made of any nonporous material (clay, metal, wood, plastic, plaster, Sculpey, etc.) A two piece mold is required when there is detail on both the front and back side of the piece and undercuts are present which makes a one piece mold impossible (bear's arms going in opposite directions). Once you've determined you will need a two piece mold, decide where you want your parting line. Try to put this in the place where it will be noticed the least. We have decided to have the part go down the side of the bear to avoid seeing it from the front (picture on the right shaded where the front and back halves of the mold will meet). We will pour the part from the least cosmetic place on the original which would be the bottom of the bear's feet.



Take Alumilite's Synthetic Modeling Clay and embed the bear to the parting line on your piece (as shown on the left). If the clay is too firm to work with effectively, warm it in an oven or microwave to soften it. It is vital that you use synthetic clay. Sulfur based clays can inhibit the curing of your silicone rubber and ruin your mold. Now that you have your clay built up to the parting line, create your mold box around your piece. Build the mold box so that you have at least .25" - .375" around your original. The box can be constructed out of many different materials. We have used corrugated plastic in this example. Some other options include plastic cups, PVC pipe, angle iron, boxes coated with plastic wrap, and even Legos. Carve a small trench in the clay that surrounds your piece. This will create a 'marker' or 'locator' so that both halves of the mold will line up and fit together perfectly every time you put your mold together.



Make sure you have completely removed all modeling clay off of your original before pouring the silicone. Carefully clean your original with a little soap & water or rubbing alcohol. Let the original dry completely and make sure your mold box is sealed. When the box is complete and the original is clean and free from any clay or fingerprints, mix and pour the silicone rubber over the original. (Picture on the left shows the poured Quickset over top of the embedded original) All of the Dow Corning silicone that we carry is mixed 10 parts base to 1 part catalyst (measured by weight). Be certain to completely mix your silicone. Any portion that isn't mixed will not cure. The rubber will be fully cured in 24 hours (only 8-18 hours if you use the Alumilite Quickset RTV).



When fully cured, flip the mold over and start by removing the clay by hand. Use a toothbrush to remove the clay in hard to reach areas. **DO NOT REMOVE YOUR ORIGINAL FROM THE RUBBER!** This will break the tight seal and may cause additional rubber to flow into the areas that are already cured. (Picture on the right shows removing the clay)



Once you have completely removed the clay, coat the rubber with Alumilite's Rubber to Rubber Mold Release. This will prevent the second layer of silicone rubber from adhering to the first. Vaseline works great for this if you do not have any of rubber to rubber release. **DO NOT MOLD RELEASE THE ORIGINAL** and be sure not to miss any rubber sections of your mold. Any area not coated with release agent will stick and will require cutting to separate the two halves apart.

Note: Silicone Rubber will not stick to anything (including your original) other than another silicone rubber. To have the second half of the mold release from the first, you must have a mold release in between the layers where ever the two halves will touch. Including the outside portions of the mold next to the mold box.



Once you've put mold release between the first and second half of the mold, mix and pour the second half of your mold. When the second layer dries (24 hours, 8-18 hours with Alumilite's Quickset RTV) your almost done. Remove your mold box and separate the 2 halves of the mold (as shown on the left). All that's left is to cut your pour hole. As mentioned above, we have chosen the bottom of the bear's feet as our pour hole (most inconspicuous location cosmetically). Use an exacto knife and cut a 'u' shaped hole where it will be the least noticeable. Use the same knife to cut vent holes to relieve the undercut formed by the position of the bear's left hand in the mold. This will allow excess air to escape that would otherwise be caught in the undercut and cause a visible air pocket. Use these only if there are constant problems with air entrapment in one particular area. You are now ready to pour your first piece out of your two piece mold.



For more detailed How To's Please visit www.alumilite.com

Tips for Successful Moldmaking

Once you've selected the correct material and determined how to properly use it, you're on the way to making good flexible molds with silicone rubber. The following recommendations will further insure your success.

1. De-Airing

De-airing is recommended for all silicone moldmaking rubbers when not using automatic dispensing equipment. The small air bubbles that result from hand mixing can become trapped in the mixture and, if not removed by de-airing, can interfere with exact surface reproduction.

Because the mixture of base and catalyst will expand during de-airing, it is important to use a container that is between 3 and 5 times the volume of the material itself. The lower-viscosity silicone moldmaking rubbers such as High Strength 2, High Strength 3, and QuickSet will expand the most, up to five times. The higher viscosity silicone rubbers such as Plat 55 will expand the least, approximately 2-3 times the volume.

The mixture can be quickly and easily de-aired in a standard vacuum chamber. This important step usually takes just a few minutes. Place the mixed silicone under vacuum at 29 inches of Hg and hold it there until it completely expands and recedes to its original level. Time required to complete de-airing depends on the size of equipment being used.

2. Inhibition

Cure of RTV materials may be inhibited by certain contaminants in or on the pattern to be molded. The inhibition reaction will impair or stop the cross linking necessary for the RTV material to cure, resulting in tackiness at the pattern interface or a total lack of cure throughout the mold.

When in doubt as to possible pattern contamination, a "patch test" is recommended. Catalyze a small amount of the RTV selected and apply it to a non critical area of the pattern to determine if it is inhibited by the pattern material.

Addition Cure Systems. Inhibition in addition cure systems such as Plat 55 RTV silicone rubbers can range from tackiness to complete lack of cure. Among materials found to cause inhibition are sulfur-containing modeling clays, natural rubber, amines, neoprene, and condensation cure RTV such as QuickSet, High Strength 2 & 3 moldmaking rubbers. Surfaces previously in contact with any of the materials mentioned may also cause inhibition. Water, when present on the part to be molded, can likewise cause inhibition.

Condensation Cure Systems. Inhibition in condensation cure systems such as QuickSet, High Strength 2 & 3 moldmaking rubbers is uncommon. However, a few modeling clays will retard the cure of any of these materials when they come in contact with the pattern. Complete cure may take days with these clays. When the clay is removed, the RTV material will cure completely, unlike inhibited addition cure materials.

Techniques to Prevent Inhibition. A standard practice to prevent inhibition is the use of a "barrier coating" to prevent the inhibiting agent from contacting the uncured RTV material. A thin layer of clear acrylic lacquer such as Krylon Crystal Clear Coat Acrylic Spray Coating sprayed directly onto the pattern is an effective barrier coating in most instances.

Another material found to be an effective barrier coating and also a release agent is polyvinyl alcohol (PVA). An 8% aqueous solution of Mowiol 66-100 works best on silicone rubber. The PVA solution can be applied by brushing, wiping, or spraying. The thinner the film, the better the reproduction. The film must be dry before molding. After the mold is cast, the film of PVA can be removed from the pattern by placing it underwater and rubbing briskly. The film will dissolve.

3. Thinners

Thinners can be used with all silicone moldmaking rubbers. Silicone Oil acts as a thinner of viscosity for the unmixed silicone. It will have a tendency to slightly lower the hardness of your cured silicone system a little bit. The Silicone Oil can bleed from the cured rubber if too much is added to the silicone, therefore we do not recommend exceeding 10%. The Silicone Oil will decrease the viscosity of the rubber and make it easier to pour.

4. Mold Life Extension

Reconditioning. The Silicone Oil can also be used to rejuvenate the mold surface to extend the mold life of the rubber. Casting resins will eventually dry out the oil that is within the silicone moldmaking rubber and by wiping a thin coat of the Silicone Oil into the mold prior to it completely breaking down, it is possible to rejuvenate the mold surface and extend the life of the mold. Rub the mold surface with the Silicone Oil and then wipe the mold surface dry with a clean cloth to remove any excess. Let the mold sit overnight.

Bake Out. A "bake out" is recommended to remove the hardeners, plasticizers, and other materials that leach out of the casting materials and are gradually absorbed into the silicone molds. A slow, gradual bake out at 200F for eight hours or a rapid bake out at 400F for two hours can be used. This will draw silicone oil from within the mold back to the surface extending the life of the mold.

5. Release Agents

Release agents are sometimes required for easy removal of some types of pattern materials that may occasionally stick. Silicones typically only stick to other silicones and will not typically adhere to any other materials. We recommend using a thin layer of melted Vaseline to prevent adhesion between silicones and other difficult to remove pattern materials. Do **not** use a silicone mold release for it will act as a primer and promote adhesion to another silicone or your pattern.

Tips for Successful Casting

As with all chemicals, you should always read and follow all of the safety precautions prior to working with the materials. Read all the safety precautions found on the Material Safety Data Sheets, printed on the bottles, and in this catalog before working with the materials.

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. Even though it has very little odor, we still recommend using Alumilite in a well ventilated area. Safety first!

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 150 degrees F for 30 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 the mold and 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, or parts under a 1/2" in thickness to ensure proper curing.

Note: Do not heat the mold in a microwave if you have painted your mold or if you have already coated the mold with the Metallic Powders prior to casting.

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 will help the air bubbles away from the surface of the mold where they can be seen in your finished part. 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 paint brush, simply paint in the baby powder and knock out the excess before casting your part.

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.

2. *Mixing*

Before mixing make sure you know the proper mix ratio of the material you are using. All of the casting resins are 1:1 by weight and/or by volume.

Before measuring out the B side of the Alumilite Regular you must first shake the B side. This allows the raw materials that separate to become homogenous again before measuring, mixing, and pouring. This will ensure the raw materials get properly mixed into the resin and that the cast piece sets up correctly achieving full cured properties.

You must mix at least a half an ounce of each side to ensure you have a proper mix ratio. If you measure out 1/4 of an ounce of A in one cup and 1/4 ounce of B in another and dump 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 (1/4 oz of each side) this will be enough to affect the mix ratio and will typically result in parts that appear darker in color and remain soft (never harden).

Once the materials have been measured out in separate cups, the preferred method of pouring one into another, to decrease the amount of air introduced, is to pour the A side into the B side.

After the materials have been poured together, mix vigorously (keeping the stir stick in contact with the bottom of the cup - reduces air from being introduced into your resin) for approximately 15-25 seconds. Make sure to scrape the sides and the bottom of the mixing cup.

3. *Pouring*

Once the material is thoroughly mixed, 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 off the bottom creating air bubbles.

Squeeze the brim of the cup to form a point. This will allow you to pour a smaller 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 half way. 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.

4. *Open Time*

To increase the open time of Alumilite resins, simply place the "A" & "B" sides of the Alumilite in the refrigerator for approximately 30 min. before pouring. This will increase your open time by 30-60 seconds. When cooling your resin, you must preheat your mold to ensure a proper cure.

Miscellaneous Tips For Moldmaking & Casting

Demolding Silicone & Resin.

To aid in the release of silicone rubber from your mold box or your original, use a small amount of rubbing alcohol. The rubbing alcohol will make the cured silicone rubber very slippery and will help separate the silicone from the other surface. After you remove the original, dry out the excess rubbing alcohol with a paper towel or dry cloth. Be sure to warm and dry out the mold completely before pouring resin into the mold to avoid the alcohol from contaminating and affecting the resin.

You can also use rubbing alcohol to assist you in removing resin pieces out of a silicone rubber mold. Use the same process as mentioned above for removing your mold from the original and the mold box.

Release Agents.

When pouring RTV silicone moldmaking rubber against any non silicone surface, mold release is not required. If you are pouring RTV silicone moldmaking rubber against itself, you must use a mold release. Use Alumilite's Rubber to Rubber release or smear a thin layer of Vaseline anywhere the silicone will come in contact with the already cured RTV silicone rubber. If no release is used the RTV silicone will bond to itself and you will have a solid chunk of silicone. You will then have to cut the silicone to remove your original.

Barrier Coating.

Using a barrier coat will protect the RTV silicone moldmaking rubber and extend the useable life of the mold. Painting the mold with a fast drying acrylic or lacquer based paint will work sufficiently. Let the paint fully cure prior to casting. When Alumilite casting resins are poured into the mold, they will chemically bond to the dried paint. When you demold your piece, the paint will release from the mold because it is now permanently a part of the casting.

Painting the mold accomplishes three things:

1. Helps extend the life of your mold
2. Helps eliminate air bubbles on the surface, caused by surface tension
3. Gives you a finished painted part

Dyes.

Alumilite's coloring dyes can be added to Alumilite's casting resins to achieve any color you desire.

The dyes should be added into the "A" side of Alumilite's resin for compatibility reasons. The dyes are reactive which means they will crosslink and become part of the cast piece. The dyes will crosslink with components on the "B" side and that is why we recommend for shelf life reasons to add the dye to the "A" side.

As a rule of thumb, the dyes can be added up to 5% of the weight of the "A" side to reach a desired color. Adding less dye will achieve a lighter color.

Fillers.

Alumilite casting resins can be filled with any dry filler of your choice. Dry fillers are used to reduce the amount of resin needed to cast a part making it more economic, add characteristics such as weight, feel, or texture, and also to add physical properties such as strength, heat resistance, and durability.

If your filler contains moisture your part will foam due to the reaction with the moisture in the system. Use dry fillers if you wish to avoid foaming in your part.

Shelf Life.

The Shelf Life of Alumilite casting resins are 1 year in a sealed unopened container. The material will remain useable as long as moisture does not contaminate the resin. For extended storage periods, store in a cool dry place.

Pressure Casting.

Pressure casting is highly recommended when using Alumilite's Water Clear. The Water Clear is perfectly clear and all imperfections or bubbles will show up in your finished casting. The use of a pressure pot when casting the clear eliminates almost all possibility of air entrapment and will ensure your casting be perfectly water clear.

After properly measuring and mixing your Water Clear, carefully pour the resin into a warm mold. Then, simply place your filled mold into a pressure pot with 40 psi. Let the material cure under that amount of pressure. When you remove your casting from your mold you will notice the part doesn't contain any air bubbles.

Adhesion.

Bonding Alumilite is best when the material is still curing shortly after demolding. The best adhesives for bonding Alumilite are ones that promote a chemical bond. Adhesives that work include but are not limited to: MMAs, epoxies, CAs (super glues), one part silicones, one part urethanes, and hot melts.

Calculating Product Usage

1. Amount of RTV needed for making a Mold

Note: *There are 21 grams per cubic inch of silicone rubber
There are 453 grams in 1 lb*

Formula for a Square/Rectangle Mold. Length x Width x Height

Example: You have a mold that is 9" x 4" x 2" = 72 cubic inches

Now using the same formula subtract the Cubic Inches of your part.

Example: Your part is 8" x 3.5" x 1.5" = 42 cubic inches

Then you would take 72 – 42 to give you a total of 30 cubic inches

30 cu in x 21 grams/cu in = 630 grams of RTV needed

And then if you want to calculate that into lbs take 630 divided by 453 grams/lb = 1.39 lbs of RTV

For Round Mold. Pi x Radius (squared) x Height

Example: The diameter of a mold is 4" (the radius would then be half of that being 2") and the height is 3"

So this is what it would look like:

2" x 2" (radius squared) x 3.14 (pi) x 3 (Height) = 37.68 cubic inches

Now subtract the volume of your part. Use the same formula to figure out the volume of your part if it is round.

The part is 3.5" diameter by 2.75" high.

So this is how you would figure out the volume of the part and the amount of silicone needed to make your mold.

1.75" x 1.75" (radius squared) x 3.14 (pi) x 2.75" (height) = 26.45 cu inches

Subtract the volume of the part from the volume of the mold box to determine how much silicone is required.

37.68 - 26.45 = 11.23 cubic inches

11.23 cu in x 21 grams per cubic inch = 236 grams of silicone

236 grams divided by 453 grams/lb = .52 lbs for the total amount of silicone needed to make a mold of the part.

2. Amount of Resin needed to cast a part.

Note: *There are .554 ounces in 1 cubic inch of Alumilite Resin*

Formula for a Square/Rectangular Piece. Length x Width x Height

Example: If your piece is 3" x 4" x 2" = 24 cubic inches

Take 24 cu in x .554 = 13.25 ounces

If your part is round you can use the same formula as the silicone (section 1.) to calculate resin needed.

Radius squared x pi x height = cubic inches of volume. Then multiply that by .554 to determine ounces needed.

3. Volume Displacement

Another way you can calculate the amount of material you will need to fill a mold or to cast a part is by using volume displacement. This means you pour something into the box or mold to figure out how much material will be needed. You will need a graduated cylinder, cup, or beaker with volumetric measurements on it.

Example: You have a mold that is neither round, square, or rectangular and therefore is not easily estimated to use one of the above formulas. You can simply, pour water into the mold until it is completely full. Then, pour the water out into your container with volumetric measurements on it to see how many ounces you will need.

Note: It is very important to make sure your mold is completely dry before casting your part. Water/moisture will contaminate your resin casting.

Another material often used is sand. This is commonly used as a volume displacement when pouring a mold. You can easily pour it in your mold box (prior to pouring your silicone RTV) and pour it out into a container with measurements on it, without effecting the original. Remember the RTV silicones are mixed by weight and will not cure properly if mixed by volume (except Alumilite's one lb kits that provide a lid and scoop premeasured for proper volume mixing).

Frequently Asked Questions (FAQs)

Casting Resins:

Q: How do I avoid air bubbles in my part?

A: Cast Alumilite into a warm mold coated with baby powder. This will help the material flow better and cure more evenly. If you are using silicone rubber, stick the mold in an oven set at "Warm" for approximately 30 minutes or put your mold in a microwave on high (1 minute for every lb or rubber in your mold). Once your mold is warm to the touch, sprinkle baby powder or talc powder in the mold. Shake the powder around the mold so all areas are covered. Once covered, knock or blow out all of the excess powder. This will leave a light coat of powder on the outside of the mold that will release the surface tension and allow the material to flow much better prohibiting air bubbles. The powder will not influence the appearance/color of your casting.

Q: What is the best way to pour my part to eliminate air bubbles that are formed when casting?

A: If you are casting a part in an open or one piece mold, pour slowly from one corner of the mold and let the material flow naturally to fill the mold. If it is possible run the material down one side of the mold. If the mold has an undercut or complex corner you may pour the material to that point and then rotate your mold to evenly coat that area before topping off the mold. If you are pouring a closed or two piece mold, fill it completely until the material comes out of the vent hole and then tap the mold on the table to help release any bubbles that may need a little assistance to get through the vent hole. You may also wish to rotate the mold and possibly squeeze the sides of the mold to assist hesitant bubbles in reaching the vent.

Q: Is Alumilite safe or toxic?

A: Alumilite is non-toxic and virtually odorless. First of all, we recommend you read any and all MSDS (Material Safety Data Sheets) and warning labels on any product that you use. All urethanes contain some type of Isocyanate. We have a very small, diluted amount of MDI Isocyanate, which was deregulated as hazardous and is not considered to be a hazardous material. Alumilite contains no mercury, (found in many other urethanes). Alumilite is not considered to be carcinogenic. Alumilite is safe for home use.

Q: Can you vary ratios?

A: No. Varying the ratios will not affect the working time but it will affect the cure time and physical properties. Meaning, Alumilite will still start to set up in its normal time but could take hours to completely cure. When it finally does cure, it will not have the same properties of the regular resin and may be considerably weaker. The off ratio casting will appear a different color and much softer.

Q: How much heat does Alumilite generate?

A: This depends on the mass you are pouring, but typically ranges between 120°F to 200°F.

Q: Can the set time be increased?

A: Yes! To get an additional 30 - 60 seconds, cool the "A" & "B" sides of the Alumilite in the refrigerator for 3-5 hours. When you cool the resin it is important to remember to pour into a warm mold for proper curing.

Q: What is the Shelf life for Alumilite?

A: Alumilite: 1 year

Q: Can Alumilite be colored? What do I use?

A: Yes. Alumilite offers a full line of dyes specially formulated for Alumilite's Casting Plastics. If you use an outside source make sure that the dyes/pigments are not water based. Some oil-based dyes are compatible. Test a small amount before mixing in larger quantities. Most powdered dyes will work if they do not contain any moisture (known as a dry filler). We also have a line of metallic powders that you may use in your molds to color Alumilite.

Q: What is the difference between Alumilite Regular and Alumilite White?

Alumilite Regular is higher in strength and is more UV stable than Alumilite White. Alumilite White is thinner which makes it easier to mix/pour and also allows you brighter colors than the Regular and is recommended when using the flesh tone dyes.

Q: How long should I mix Alumilite?

A: Mix thoroughly for 20-30 seconds (be sure to scrape the sides and the bottom of your container).

Q: How much heat can Alumilite take before disformation or melting.

A: Alumilite will not melt. It will start disforming at around 425°F. If excessive pressure is applied, the resin may start to give way at about 250-275°F.

Q: Can I paint Alumilite?

A: Yes! We recommend lacquers but you may also use synthetics, water-based acrylics, or enamels. It is a great idea to paint the part as soon as it is demolded to ensure a good bond is achieved. You may wish to paint your silicone mold before casting Alumilite. Paint the mold with a fast drying acrylic or clear coat. Once it is completely dry, cast your piece. When you demold the part you will pull out a painted piece. Alumilite will chemically bond to the dried paint.

Q: Can I spin cast Alumilite?

A: Yes! Alumilite works extremely well in a spin casting machine. Although spin casting was originated for low melt metals, you can get excellent castings with Alumilite. This technique allows you to cast parts in a fraction of the time of conventional pouring.

Q: Can I rotational mold Alumilite?

A: Yes! Alumilite's low viscosity is ideal for picking up the detail required in thin walled rotational molded pieces. The hollow center will cut cost dramatically by reducing the amount of material that is required to cast your part.

Q: What kind of mold release can I use?

A: If casting with silicone, it is usually not necessary to use a mold release. If in doubt or you are pouring into molds that are not made of silicone, Alumilite's Stoner Mold release or a thick layer paste wax is recommended. Post washing your part may be required if you are painting your parts to remove mold release transfer.

Q: Is it necessary to vacuum or pressure the Water Clear and Flex 80?

A: Not in order for it to cure but yes in order for it to cure with absolutely no air bubbles present within the cast piece as well as the best physical properties. Both of these materials start out at a higher viscosity (thicker) than the other Alumilite resins. Therefore, when these two materials are mixed, the viscosity (consistency) of the material does not allow the air bubbles to freely find their way to the top of the cast piece as the other much thinner resins do before the material cures. These two materials feature a slightly longer open/work time in order for you to either vacuum and/or pressure cast to eliminate all of the bubbles within the casting.

Silicone Moldmaking Rubber:

Q: What is the mix ratio of my RTV silicones?

A: The mix ratio is 10:1 by weight for all of the silicone rubbers other than the Mold Putty which is 1:1 by weight or volume.

Q: What is the shelf life of Alumilite's silicone mold making rubbers?

A: 6 months.

Q: What types of molds can I pour Alumilite into?

A: With the proper release, you can make a mold out of almost anything. Here are a few examples: Silicone, Wax, Non-Sulfur Clay, Urethane, Latex, Plaster, Steel, Aluminum, and Wood. A thick paste wax is recommended for non-silicone based items.

Q: What is catalyst?

A: The catalyst is what causes the silicone RTV to cure or harden. It is either tin or platinum base. The tin base systems are much more user friendly and will harden against practically any surface.

Q: What rubbers are compatible to pour over one another?

A: You can pour tin over tin base, platinum over platinum base and tin over platinum base. You can not pour platinum base over tin base.

Q: How many parts will I get per mold before the mold starts to break down?

A: This depends on many things. Some of the factors are how many undercuts, how long the parts are left in the mold before demolding, the intricacy, the detail, the size of the part, and how well the mold is cared for. It also depends on how often you are pouring, how hot your mold gets and if they are allowed to cool between pours. The Quick Set and Mold Putty will release the fewest castings before tearing (10-40 parts) where as the High Strength 2 & 3, and the Plat 55 may release 50-200 parts. (This all depends on the type of part and mold along with all of the other factors we previously mentioned above.)

Q: Is there anything I can do to prolong the life of the mold?

A: Using mold release before pouring parts can double the life of your mold. You can also use Alumilite's Silicone Oil in your molds before storing them. This will rejuvenate or restore some of the depleted silicone oil the casting resins removed from the silicone mold.

Q: What is vacuuming and why should I do it?

A: Vacuuming: A vacuum pump is like a vacuum cleaner. A vacuum cleaner is designed to pick up things such as dirt off of carpet using suction or vacuum. A vacuum pump is identical to a vacuum cleaner, except it will have MUCH more suction. A vacuum system is measured in the amount of vacuum it will pull. In technical terms, it is measured in inches of mercury. A common household vacuum will pull 1-2 inches of mercury. A good vacuum pump will pull 29-30 inches of mercury. A vacuum pump is used to suck the air from the mixed silicone to assist in pouring air/void free molds.

Vacuuming Silicone: As you mix the catalyst into the base, you will also be mixing air into the silicone. This will cause the silicone to be full of bubbles. Our Quick Set Silicone has a thin enough viscosity the majority of air bubbles will rise to the surface without a vacuuming system. Plat 55 is too thick to allow air bubbles to rise. Therefore, you must pull a vacuum to assure no air is entrapped. Once your vacuum reaches 29-30 inches of mercury, the rubber will foam up. You will need a container around 4 times the size of the amount of silicone you are mixing. Once the rubber has risen, it will break (meaning to fall quickly). After the silicone falls, you will want to keep it under vacuum for another 2-3 minutes. Then remove the material from the vacuum and pour the rubber over your master. You may want to pull a second vacuum after the mold has been poured. This will remove any air that you may have entrapped while pouring. Remember, once the rubber has risen and fallen, it will not rise again. Our Vacuum Chambers are 10" x 12".

Trouble-Shooting: (Alumilite)

Q: Why isn't the Alumilite curing properly?

A: Discoloration: The mixture is either off or it was poured into a cold mold.

Not Curing: The mold was not warmed. It should be warmed to at least 100°F. The Alumilite should generate enough heat to keep the mold warm if you are continuously pouring. You can do this by putting your silicone mold in the oven or a microwave oven for a few minutes until it is warm to the touch. The silicone can withstand temperatures of over 400F, so don't worry about burning your mold.

Q: Why is my Alumilite Casting resin foaming?

A: Moisture contamination causes foaming. If it foams quite a bit, most likely the moisture is right in the Alumilite. The moisture is usually in the A-side. You can vacuum the A-side to relieve it of moisture. If you don't have access to vacuuming equipment, you may be able to boil the moisture off. This is possible because water has a lower boiling temperature than any of the other liquids in the A-side. To boil off the material, we recommend that you put the Alumilite resin in a glass or metal container and place the material in an oven at 250°F for 2 hours. This will draw the moisture out of the system and evaporate it. If you are getting a bunch of little pin-holes, the moisture is probably coming from some materials you are using (mold, cups, stir sticks, etc.).

Q: Why do I have air bubbles?

A: This is most likely caused by air pockets that are trapped between the resin and the silicone. To help combat this, dust your mold with baby powder. Then flip it over and slap the mold on the table leaving a very thin layer on the inside of your mold. This will act as a lubricant for the air and will allow it to easily rise to the surface. You can also use any kind of paint or commercial brand of urethane release to aid in the problem if baby powder isn't available. For complex molds that have severe undercuts, you may need to vent those troubled areas with holes that can be created with either some copper tubing or an Exacto knife.

Q: What can I do if I am still having problems with my moldmaking and casting project if I can't find the answer in this catalog?

A: You have a couple of options. First and foremost call 1-800-447-9344 and speak with one of our technical representatives that will be glad to assist you. Our office hours are Mon-Fri, 8 am-5 pm.

Your second option is to visit us online. There we have a much more in depth How To guide, FAQs, as well as a open moldmaking and casting forum for you to offer your questions to be answered by professional and hobby moldmakers and casters. Our technical representatives monitor the forum and also answer the questions that are often asked. So please visit us online at www.alumilite.com to find out more about the wonderful world of moldmaking and casting by Alumilite.

1. Identification

Product Identifier: AlumiRes (RC-3) Tan Part A
Amazing Casting Resin Part A

Product Code(s): ALRC3A

Use: Component for Mold Making and Casting. For Industrial/Professional use only.

Manufacturer: Alumilite
315 E. North Street Kalamazoo, MI 49007 USA

Phone Number: +1 800-447-9344 (9 a.m. to 5 p.m. EST)

Emergency Phone: CHEMTREC 800-424-9300 or
+1 703-527-3887

E-mail: info@alumilite.com

2. Hazards Identification

GHS Classification:
Eye Irritation Category 2A

Label Elements: Warning!



Hazard Phrases
H319 Causes serious eye irritation.

Precautionary Phrases
P264 Wash thoroughly after handling.
P280 Wear eye/face protection.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P337+P313 If eye irritation persists: Get medical advice or attention.

Supplemental Information: Read and understand the hazard information on Part B before using.

3. Composition/Information on Ingredients

Chemical Name	CAS #	%
Propoxylated Amine	102-60-3	30-40
Other ingredients are not classified as health, physical or environmental hazards, or are present below cut-off/concentration limits.		

4. First-Aid Measures

Eye Contact: Rinse thoroughly with water, holding the eyelids open to be sure the material is washed out. Remove contact lenses if safe and easy to do. Continue rinsing. Get medical attention if irritation persists.

Skin Contact: Remove contaminated clothing. Wash contact area thoroughly with soap and water. Get medical attention if irritation persists.

Inhalation: Remove person to fresh air. Get medical attention if symptoms persist.

Ingestion: Do not induce vomiting unless directed to do so by medical personnel. Get medical attention.

Most Important Symptoms/Effects: Causes serious eye irritation.

Indication of Immediate Medical Attention/Special Treatment: If product gets in eyes, immediately flush with water.

5. Fire-Fighting Measures

Extinguishing Media: Use water fog, foam, carbon dioxide or dry chemical. Do not use solid water stream. Solid stream of water into hot product may cause violent steam generation or eruption.

Specific Hazards: Not classified as flammable or combustible. Product will burn under fire conditions. Combustion products include oxides of carbon and nitrogen and other toxic organic compounds.

Special Protective Equipment & Precautions for Fire-Fighters: Wear positive pressure, self-contained breathing apparatus and full-body protective clothing. Cool fire-exposed containers with water.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures: Remove all ignition sources. Clear non-emergency personnel from the area. Wear appropriate protective clothing to prevent eye and skin contact and avoid breathing vapors. Caution – spill area may be slippery.

Methods and Materials for Containment and Cleanup: Cover with an inert absorbent material and collect into an appropriate container for disposal. Avoid releases to the environment. Report spills and releases as required to appropriate authorities.

7. Handling and Storage

Safe Handling: Use with adequate ventilation. Avoid contact with the eyes, skin and clothing. Wash thoroughly after handling. Do not eat, drink or smoke in the work area. Keep container closed when not in use.

Safe Storage: Store in a cool, dry place. Store in original containers. Avoid getting moisture into containers. Keep containers tightly closed.

8. Exposure Controls/Personal Protection

Occupational Exposure Limits: None established.

Ventilation: Use with adequate general or local exhaust ventilation to minimize exposure levels.

Respiratory Protection: If needed, an approved respirator with organic vapor cartridges may be used. Respirator selection and use should be based on contaminant type, form and concentration.

Skin Protection: Wear impervious gloves, such as butyl rubber or nitrile rubber.

Eye Protection: Wear chemical safety goggles.

Other Protective Measures: Wear impervious clothing to prevent skin contact and contamination of personal clothing. An eye wash facility and washing facility should be available in the work area. Follow applicable regulations and good Industrial Hygiene practice.

9. Physical and Chemical Properties

Appearance: Pale yellow liquid

Odor: Mild

Odor Threshold: No data available

pH: No data available

Melting Point: No data available

Boiling Point: No data available

Flash Point: $\geq 200^{\circ}\text{F}$

Evap. Rate: ≤ 1

Upper/Lower Flammability Limits: No data available

Vapor Pressure: No data available

Vapor Density: No data available

Relative Density: No data available

Solubility: Negligible in water

Partition Coefficient: n-octanol/Water: No data available

Auto-Ignition Temp: No data available

Decomposition Temp: No data available

Viscosity: No data available

10. Stability and Reactivity

Reactivity: Not normally reactive.

Chemical Stability: Stable under recommended conditions.

Possibility of Hazardous Reactions: None known.
Conditions to Avoid: Avoid excessive heat and moisture.
Incompatible Materials: Avoid contact with strong acids, bases and strong oxidizing agents.
Hazardous Decomposition Products: Thermal decomposition will generate oxides of carbon, organic acids, and/or other toxic organic compounds.

11. Toxicological Information

Eye Contact: Causes serious eye irritation.
Skin Contact: May cause mild irritation.
Inhalation: Vapors and mists may cause mild respiratory irritation.
Ingestion: No information available.
Chronic Health Effects: No data available.
Acute Toxicity Values: No data available.
Skin Corrosion/Irritation: Components are not skin irritants.
Eye Damage/Irritation: Serious eye irritant.
Respiratory Irritation: Components are not classified as respiratory irritants.
Respiratory Sensitization: Components are not respiratory sensitizers.
Skin Sensitization: Components are not skin sensitizers.
Germ Cell Mutagenicity: Components are not mutagens.
Carcinogenicity: Components are not carcinogens.
Reproductive Toxicity: Components are not reproductive toxins.
Specific Target Organ Toxicity: Single Exposure: No data available.
Repeat Exposure: No data available.

12. Ecological Information

Ecotoxicity: This product is not classified as hazardous to the aquatic environment. Do not release into waterways.
Persistence and Degradability: No data available.
Bioaccumulative Potential: Not expected to bioaccumulate.
Mobility in Soil: No data available.

13. Disposal Considerations

Dispose according to local, state and federal regulations.
For U.S.: Upon disposal, this product is not a RCRA hazardous waste (per 40 CFR 261).

14. Transport Information

Not regulated for transport in any mode.
Emergency Shipping Information: CHEMTREC, 800-424-9300 or +1-703-527-3887

15. Regulatory Information

U.S. FEDERAL REGULATIONS:
CERCLA 103 Reportable Quantity: This product is not subject to reporting under CERCLA. Some states have more stringent reporting requirements. Report all spills in accordance with local, state, and federal regulations.

SARA TITLE III

Section 313 Toxic Chemicals: This product contains no chemicals subject to SARA Title III Section 313 Reporting requirements.
Section 302 Extremely Hazardous Substances (TPQ): None

EPA Toxic Substances Control Act (TSCA) Status: All of the components of this product are listed on TSCA.

STATE REGULATIONS:

California Proposition 65: This product does NOT contain substances known to the State of California to cause cancer and/or reproductive harm.

16. Other Information

Training Advice: All personnel using/handling this product should be trained in proper chemical handling and the need for and use of engineering controls and protective equipment.

Recommended Uses and Restrictions: This product is intended for industrial/professional use only.

SDS Revision Notes: New GHS Format August 7, 2018

Disclaimer: The information contained herein is considered accurate; however, Alumilite makes no warranty regarding the accuracy of the information. The user must determine the suitability of the product for the intended use and accept all risk and liability associated with that use.

1. Identification

Product Identifier: AlumiRes (RC-3) Tan Part B
Product Code(s): ALRC3B
Use: Component for Mold Making and Casting. For Industrial/Professional use only.
Manufacturer: Alumilite
 315 E. North Street Kalamazoo, MI 49007 USA
Phone Number: +1 800-447-9344 (9 a.m. to 5 p.m. EST)
Emergency Phone: CHEMTREC 800-424-9300 or +1 703-527-3887
E-mail: info@alumilite.com

2. Hazards Identification
GHS Classification:

Acute Toxicity - Inhalation Category 4
 Skin Irritation Category 2
 Eye Irritation Category 2B
 Respiratory Sensitization Category 1
 Skin Sensitization Category 1B
 Specific Target Organ Toxicity-Single Exposure Category 3
 Specific Target Organ Toxicity-Repeat Exposure Category 2
 Aspiration Toxicity 1

Label Elements: Danger


Hazard Phrases

H304 May be fatal if swallowed and enters airways.
 H315 Causes skin irritation.
 H317 May cause an allergic skin reaction.
 H320 Causes eye irritation.
 H332 Harmful if inhaled.
 H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
 H335 May cause respiratory irritation.
 H373 May cause damage to organs through prolonged and repeated exposure.

Precautionary Phrases

P261 Avoid breathing vapors or mists.
 P264 Wash thoroughly after handling.
 P271 Use only outdoors or in a well-ventilated area.
 P280 Wear protective gloves, protective clothing, eye protection, and face protection.
 P284 In case of inadequate ventilation, wear respiratory protection.
 P301+310 IF SWALLOWED: Immediately call POISON CENTER/doctor.
 P302+352 IF ON SKIN: Wash with plenty of soap and water.
 P305+351+338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P304+340 IF INHALED: If breathing is difficult, remove person to fresh air and keep comfortable for breathing.
 P312 Call POISON CENTER/doctor if you feel unwell.
 P331 Do NOT induce vomiting.
 P332+313 If skin irritation occurs: Get medical advice/attention.
 P337+313 If eye irritation persists: Get medical advice/attention.
 P342+311 If experiencing respiratory symptoms: Call a POISON CENTER/doctor.
 P362+364 Take off contaminated clothing and wash before reuse.
 P403+233 Store in a well-ventilated place. Keep container tightly closed.
 P405 Store locked up.
 P501 Dispose of contents and container in accordance with local, regional and national regulations.

Supplemental Information: Individuals sensitized to isocyanates should discontinue use. This is one part of a two-part system. Read and understand the hazard information on part B before using.

3. Composition/Information on Ingredients

Chemical Name	CAS #	%
Diphenylmethane-4,4' diisocyanate (MDI)	101-68-8	40-50
P-MDI	9016-87-9	25-35
Benzene, C-10-C13 Alkyl	129813-58-7	25-35

Other ingredients are not classified as health, physical or environmental hazards, or are present below cut-off/concentration limits.

4. First-Aid Measures

Eye Contact: Rinse thoroughly with water for at least 15 minutes, holding the eyelids open to be sure the material is washed out. Get prompt medical attention.
Skin Contact: Remove contaminated clothing. Wash contact area thoroughly with soap and water. Get medical attention if irritation or symptoms of exposure develop. Launder clothing before reuse. Discard items that cannot be decontaminated.
Inhalation: Remove person to fresh air. Give artificial respiration if needed. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.
Ingestion: Do NOT induce vomiting unless directed to do so by medical personnel. Get medical attention.
Most Important Symptoms/Effects: Causes skin and eye irritation. Vapors or mists may cause respiratory irritation. May cause allergic skin and/or respiratory reaction in sensitized persons. Symptoms include skin rash, wheezing, shortness of breath and other asthma symptoms.
Indication of Immediate Medical Attention/Special Treatment: Immediate medical attention is required for asthmatic symptoms or serious inhalation exposures. Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress. Persons sensitized to Diisocyanates should consult a physician before working with respiratory irritants or sensitizers.

5. Fire-Fighting Measures

Extinguishing Media: Use water fog, foam, carbon dioxide or dry chemical. Do not use solid water stream. Solid stream of water into hot product may cause violent steam generation or eruption.
Specific Hazards: Not classified as flammable or combustible. Product will burn under fire conditions.
Special Protective Equipment & Precautions for Fire-Fighters: Wear positive pressure, self-contained breathing apparatus and full-body protective clothing. Cool fire-exposed containers with water.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures: Remove all ignition sources. Clear non-emergency personnel from the area. Ventilate area. Wear appropriate protective clothing to prevent eye and skin contact and respiratory protection.
Methods and Materials for Containment and Cleanup: Cover with an inert absorbent material and collect into an appropriate container for disposal. Do not seal the container since CO₂ is generated on contact with moisture and dangerous pressure buildup can occur. Decontaminate floor area with a mixture of water (90%) plus household ammonia (8%), and detergent (2%).

7. Handling and Storage

Safe Handling: Avoid breathing vapors or mists. Use with adequate ventilation. Avoid contact with the eyes, skin and clothing. Wash

thoroughly after handling. Do not eat, drink or smoke in the work area. Keep container closed when not in use.

Safe Storage: Store indoors at temperatures between 55°F and 95°F (13°C and 35°C). Store in original, unopened containers. Protect from atmospheric moisture and water.

8. Exposure Controls/Personal Protection

Occupational Exposure Limits: For MDI:

OSHA PEL	0.02 ppm (C)
ACGIH TLV	0.005 ppm TWA

Ventilation: Use with adequate general or local exhaust ventilation to maintain exposure levels below the occupational exposure limits.

Respiratory Protection: If needed (i.e., ventilation is inadequate), use a NIOSH-approved air-purifying, tight-fitting, half-face respirator with organic vapor cartridges. Respirator selection and use should be based on contaminant type, form and concentration. For higher exposures or in an emergency, use a supplied-air respirator. Use respirators in accordance with OSHA's Respiratory Protection Standard (29 CFR 1910.134).

Skin Protection: Wear impervious gloves, such as butyl rubber or nitrile rubber.

Eye Protection: Wear chemical safety goggles/glasses.

Other Protective Measures: Wear impervious clothing to prevent skin contact and contamination of personal clothing. An eye wash and washing facility should be available in the work area. Follow good Industrial Hygiene practices.

9. Physical and Chemical Properties

Appearance: Clear amber liquid

Odor: Mild

Odor Threshold: Not determined

pH: Not applicable

Melting Point: No data available

Boiling Point: 200°C

Flash Point: >350°F (177°C) estimated

Evap. Rate: No data available

Flammable Limits: No data available

Vapor Pressure: ≤0.01 mm Hg @ 20°C

Vapor Density: No data available

Relative Density: No data available

Solubility: Insoluble in water

Partition Coefficient: n-octanol/Water: Reacts with water

Auto-Ignition Temp: No data available

Decomposition Temp: No data available

Viscosity: No data available

10. Stability and Reactivity

Reactivity: Diisocyanates react with many materials and the rate of reaction increases with temperature. Reaction with water generates carbon dioxide and heat.

Chemical Stability: Stable under recommended conditions.

Possibility of Hazardous Reactions: Elevated temperatures can cause hazardous polymerization. Polymerization can be catalyzed by strong bases or water. Reaction with water generates carbon dioxide, and results in heat and pressure buildup in closed systems.

Conditions to Avoid: Avoid moisture and temperatures below 55°F (13°C) and above 95°F (35°C) to protect product integrity.

Incompatible Materials: Avoid contact with water, acids, bases, alcohols and strong oxidizers.

Hazardous Decomposition Products: Possibly isocyanate vapor, carbon monoxide, nitrogen oxides, and carbon dioxide.

11. Toxicological Information

Eye Contact: Causes serious eye irritation. May cause temporary corneal injury.

Skin Contact: May cause irritation. Repeated skin contact may cause an allergic skin reaction. Animal studies indicate that skin contact with isocyanates may elicit respiratory sensitization.

Inhalation: At room temperature, vapors are minimal due to low volatility. Vapors or aerosols (e.g., generated during heating or spraying) may cause respiratory irritation and possibly pulmonary edema, or respiratory sensitization. For individuals sensitized to isocyanates, exposure may result in allergic respiratory reactions (e.g., coughing, wheezing, difficulty breathing).

Ingestion: Droplets of the product aspirated into the lungs through ingestion or vomiting may cause a serious chemical pneumonia.

Chronic Health Effects: Repeated or prolonged exposure to isocyanates may cause an allergic sensitization of the respiratory tract causing an asthma-like response upon re-exposure. Repeated overexposure to isocyanates has been associated with decreased lung function. Repeated or prolonged dermal contact with this product may cause allergic skin sensitization in some individuals. No test data. Product is not expected to be a mutagen or reproductive toxin.

Acute Toxicity Values: For MDI: Oral rat LD₅₀ >2,000 mg/kg; Skin rabbit LD₅₀ >9,400 mg/kg; Inhalation rat LC₅₀ 2.0 mg/L

Carcinogenicity: Relevant components are not listed as known or suspected carcinogens by NTP, IARC or OSHA.

Specific Target Organ Toxicity: Single Exposure: Classified as STOT-SE Category 3 for respiratory irritation. Repeat Exposure: Classified as STOT-RE 2. Tissue injury in the upper respiratory tract and lungs has been observed in laboratory animals after repeated excessive exposures to isocyanate aerosols.

Aspiration Toxicity: May be fatal if swallowed and enters airways.

12. Ecological Information

Ecotoxicity: No data available. Do not release into waterways.

Persistence and Degradability: No data available.

Bioaccumulative Potential: No data available.

Mobility in Soil: No data available.

13. Disposal Considerations

Dispose according to local, state and federal regulations. Upon exposure to moisture, product forms an inert, non-hazardous solid. In the U.S., this product is not a RCRA hazardous waste (per 40 CFR 261).

14. Transport Information

Not regulated for transport in any mode.

EMERGENCY SHIPPING: CHEMTREC, 800-424-9300 or +1-703-527-3887

15. Regulatory Information

U.S. FEDERAL REGULATIONS:

CERCLA Reportable Quantity: RQ for MDI is 5000 lb. Some States have more stringent requirements. Report spills in accordance with local and state regulations.

SARA TITLE III Section 311/312: Acute Health, Chronic Health

Section 313 Toxic Chemicals: This product contains the following chemicals subject to SARA Title III Section 313 Reporting requirements: Diphenylmethane-4,4'-diisocyanate CAS 101-68-8

EPA Toxic Substances Control Act (TSCA) Status: Components of this product are listed on the TSCA inventory.

STATE REGULATIONS:

California Proposition 65: This product is not known to contain substances known to the State of California to cause cancer and/or reproductive harm.

www.P65Warnings.ca.gov

16. Other Information

1. Identification

Product Identifier: Quick-Set Silicone Rubber Catalyst
Use: Component for silicone mold rubber. For Industrial/Professional use only.
Manufacturer: Alumilite
 315 E. North Street Kalamazoo, MI 49007 USA
Phone Number: +1 800-447-9344 (9 a.m. to 5 p.m. EST)
Emergency Phone: CHEMTREC 800-424-9300 or +1 703-527-3887
E-mail: info@alumilite.com

2. Hazards Identification

GHS Classification:
 Skin Irritation Category 1
 Eye Damage/Irritation Category 1
 Respiratory Sensitizer Category 1
 Skin Sensitizer Category 1
 Germ Cell Mutagenicity 2
 Toxic to Reproduction Category 1B
 Specific Target Organ Toxicity – Single Exposure Category 1

Label Elements: Danger



Hazard Phrases

H314 Causes severe skin burns and eye damage.
 H317 May cause an allergic skin reaction.
 H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
 H341 Suspected of causing genetic defects.
 H360 May damage fertility or the unborn child.
 H370 Causes damage to organs.

Precautionary Phrases

P201 Obtain special instructions before use.
 P260 Do not breathe mist or vapor.
 P264 Wash hands thoroughly after handling.
 P270 Do not eat, drink or smoke when using this product.
 P280 Wear protective gloves, clothing, eye and face protection.
 P284 In case of inadequate ventilation wear respiratory protection.
 P301+312 IF SWALLOWED: Call a poison center or doctor if you feel unwell.
 P303+361+353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
 P304+340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
 P305+351+338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P308+313 IF exposed or concerned: Get medical attention.
 P333+313 If skin irritation or rash occurs: Get medical advice/attention.
 P342+311 If experiencing respiratory symptoms: Call a POISON CENTER or doctor.
 P363 Wash contaminated clothing before reuse.
 P405 Store locked up.
 P501 Dispose of contents and container in accordance with local, regional and national regulations.

Supplemental Information: Avoid releases into the environment. Collect spillage.

3. Composition/Information on Ingredients

Chemical Name	CAS #	GHS Classification	%
Dibutyltin dilaurate	77-58-7	Skin Corr/Irrit 1 Eye Damage/Irrit 1 Skin Sens 1 Mutagenicity 2 Reproductive Tox 1B STOT-SE 1 Aquatic Acute 1 Aquatic Chronic 1	5-10
Nadic Methyl Anhydride	25134-21-8	Acute Tox-Oral 4 Acute Tox-Inhal 3 Skin 2, Eye 1, Respiratory Sensitizer 1, Skin Sensitizer 1	0-5
Other ingredients are not classified as health and/or environmental hazards, and/or are present below cut-off/concentration limits.			

4. First-Aid Measures

Eye Contact: Rinse thoroughly with water, holding the eyelids open to be sure the material is washed out. Remove contact lenses, if present and easy to do. Continue rinsing for 15 minutes. Get medical attention if irritation develops and persists.

Skin Contact: Wash contact area thoroughly with soap and water. Get medical attention if irritation develops and persists.

Inhalation: If breathing is difficult, remove person to fresh air. If experiencing difficulty breathing, call a poison center or doctor.

Ingestion: If swallowed, rinse mouth. Induce vomiting only with medical supervision.

Most Important Symptoms/Effects: Possible reproductive and/or organ damage.

Indication of Immediate Medical Attention/Special Treatment: No data available.

5. Fire-Fighting Measures

Extinguishing Media: Carbon dioxide, dry chemical, foams, or water spray.

Specific Hazards: Not classified as flammable. May generate formaldehyde in fire conditions.

Special Protective Equipment and Precautions for Fire-Fighters:

Wear SCBA & full-body protective suit. Cool hot containers with water.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures: Remove ignition sources. Clear non-emergency personnel from the area. Caution: spill area may be slippery. Avoid eye and skin contact.

Methods and Materials for Containment and Cleanup: Contain spill and prevent/minimize release to the environment. Collect and containerize material for disposal.

7. Handling and Storage

Safe Handling: Avoid contact with eyes, skin and clothing. Use in a ventilated area. Wash hands after handling.

Safe Storage: Store indoors at temperatures between 60 and 95°F. Store in original containers. Avoid getting moisture into containers. Keep containers tightly closed.

8. Exposure Controls/Personal Protection

Exposure Limits:

Tin, organic compounds	0.1 mg/m ³ OSHA PEL
	0.1 mg/m ³ TWA ACGIH TLV
	0.2 mg/m ³ STEL ACGIH TLV

Ventilation: Use with adequate general or local exhaust ventilation to maintain exposure levels below the occupational exposure limits.

Respiratory Protection: If needed (i.e., ventilation is inadequate), use a NIOSH-approved air-purifying, tight-fitting, half-face respirator with organic vapor cartridges. Respirator selection and use should be based on contaminant type, form and concentration. For higher exposures or in an emergency, use a supplied-air respirator. Use respirators in accordance with OSHA's Respiratory Protection Standard (29 CFR 1910.134).

Skin Protection: Wear impervious gloves, such as butyl rubber or nitrile rubber.

Eye Protection: Wear chemical safety goggles/glasses.

Other Protective Measures: Wear impervious clothing to prevent skin contact and contamination of personal clothing. An eye wash and washing facility should be available in the work area. Follow good Industrial Hygiene practices.

9. Physical and Chemical Properties

Appearance: Liquid, yellow

Odor: No data available

Odor Threshold: No data available

pH: Not applicable

Melting Point: No data available

Boiling Point: No data available

Flash Point: >200°F (93.3°C)

Evaporation Rate: No data available

Flammable Limits: No data available

Vapor Pressure: No data available

Vapor Density: No data available

Relative Density: 1.0 @ 25°C

Solubility: Insoluble in water

Partition Coefficient: n-octanol/Water: No data available

Auto-Ignition Temp: No data available

Decomposition Temp: No data available

Viscosity: 50-100 cP @ 25°C

10. Stability and Reactivity

Reactivity: Not normally reactive.

Chemical Stability: Stable under recommended conditions.

Possibility of Hazardous Reactions: None known.

Conditions to Avoid: Excessive heat.

Incompatible Materials: Possibly strong oxidizers.

Hazardous Decomposition Products: Thermal decomposition will generate formaldehyde and oxides of carbon and silicon.

11. Toxicological Information

Eye Contact: Causes serious eye damage.

Skin Contact: Causes severe skin burns and eye damage.

Inhalation: May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Ingestion: No data available.

Chronic Health Effects: Possible reproductive and immune system effects.

Acute Toxicity Values: For Nadic Methyl Anhydride, For LD50-Oral 914 mg/kg (rat). LD50-Inhalation 0.75 mg/L (rat). Dibutyltin dilaurate, LD50-Oral 2071 mg/kg (rat).

Germ Cell Mutagenicity: Dibutyltin dilaurate is suspected of causing genetic defects.

Carcinogenicity: Relevant components are not listed as known or suspected carcinogens by NTP, IARC or OSHA.

Reproductive Toxicity: Dibutyltin dilaurate may damage fertility or the unborn child.

Specific Target Organ Toxicity: Single exposure: Dibutyltin dilaurate causes damage to organs (immune system). Repeat exposure: No data available.

12. Ecological Information

Ecotoxicity: For dibutyltin dilaurate, EC50 Daphnia is 0.463 mg/l. Based on Summation Method, mixture is judged to be Hazardous to the Aquatic Environment (Acute Category 2, Chronic Category 2).

Persistence and Degradability: Dibutyltin dilaurate is not readily biodegradable.

Bioaccumulative Potential: No data available.

Mobility in Soil: No data available.

13. Disposal Considerations

Dispose according to local, regional and national regulations.

For U.S.: Upon disposal, these products are not RCRA hazardous waste (per 40 CFR 261).

14. Transport Information

U.S.: Not regulated as a hazardous material by US DOT for transportation by truck.

International shipments: UN3082, Environmentally hazardous substance, liquid, n.o.s. (dibutyltin dilaurate), 9, III. Containers ≤5 liters are exempted from IMDG and IATA regulations (see IATA SP A197 and IMDG 2.10.2.7).

Emergency Shipping Information: Call CHEMTREC, 800-424-9300 or +1-703-527-3887

15. Regulatory Information

U.S. FEDERAL REGULATIONS:

CERCLA 103 Reportable Quantity: Not subject to reporting under CERCLA. Some states have more stringent reporting requirements. Report all spills in accordance with local, state, and federal regulations.

SARA TITLE III:

Hazard Category for Section 311/312: Acute/Chronic
Section 313 Toxic Chemicals: Does not contain chemicals subject to SARA Title III Section 313 Reporting requirements.

Section 302 Extremely Hazardous Substances (TPQ): None

EPA Toxic Substances Control Act (TSCA) Status: All components are listed on TSCA.

STATE REGULATIONS:

California Proposition 65: This product does not contain substances known to the State of California to cause cancer and/or reproductive harm.

16. Other Information

Training Advice: All personnel using/handling these products should be trained in proper chemical handling and the need for and use of engineering controls and protective equipment.

Recommended Uses and Restrictions: For industrial or professional use only.

SDS Revision Notes: GHS Version, August 12, 2019

Disclaimer: The information contained herein is considered accurate; however, Alumilite makes no warranty regarding the accuracy of the information. The user must determine the suitability of the product for the intended use and accepts all risk and liability associated with that use.

1. Identification

Product Identifier: Quick-Set Silicone Rubber Base
Use: Component for silicone mold rubber. For Industrial/Professional use only.
Manufacturer: Alumilite
 315 E. North Street Kalamazoo, MI 49007 USA
Phone Number: +1 800-447-9344 (9 a.m. to 5 p.m. EST)
Emergency Phone: CHEMTREC 800-424-9300 or +1 703-527-3887
E-mail: info@alumilite.com

2. Hazards Identification

GHS Classification:
Reproductive Toxicity 2

Label Elements: Warning



Hazard Phrases

H361 Suspected of damaging fertility or the unborn child.

Precautionary Phrases

P202 Do not handle until all safety precautions have been read and understood.
 P280 Wear protective gloves/protective clothing/eye protection/face protection.
 P308+313IF exposed or concerned: Get medical advice/attention.
 P405 Store locked up.
 P501 Dispose of contents and container in accordance with local, regional and national regulations.

Supplemental Information: May cause mild eye and skin irritation. Avoid contact with eyes and mucous membranes.

3. Composition/Information on Ingredients

Chemical Name	CAS #	GHS Classification	%
Octamethylcyclotetrasiloxane	556-67-2	Reproductive Toxicity 2	<1

Ingredients are not classified as health and/or environmental hazards, and/or are present below cut-off/concentration limits.

4. First-Aid Measures

Eye Contact: Rinse thoroughly with water, holding the eyelids open to be sure the material is washed out. Get medical attention if irritation develops and persists.

Skin Contact: Wash contact area thoroughly with soap and water. Get medical attention if irritation develops and persists.

Inhalation: If breathing is difficult, remove person to fresh air. If experiencing difficulty breathing, call a doctor.

Ingestion: If swallowed, rinse mouth. Drink water. Induce vomiting only with medical supervision.

Most Important Symptoms/Effects: Mild eye irritation.

Indication of Immediate Medical Attention/Special Treatment: Not expected to be required.

5. Fire-Fighting Measures

Extinguishing Media: Carbon dioxide, dry chemical, foams, or water spray.

Specific Hazards: Not classified as flammable or combustible. May generate formaldehyde in fire conditions.

Special Protective Equipment and Precautions for Fire-Fighters: Wear SCBA & full-body protective suit. Cool hot containers with water.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures: Remove ignition sources. Clear non-emergency personnel from the area. Caution: spill area may be slippery. Avoid eye and skin contact.

Methods and Materials for Containment and Cleanup: Contain spill and prevent/minimize release to the environment. Collect and containerize material for disposal.

7. Handling and Storage

Safe Handling: Avoid contact with eyes, skin (especially mucous membranes) and clothing. Use in a ventilated area. Wash hands after handling.

Safe Storage: Store indoors at temperatures between 60 and 95°F. Store in original containers. Avoid getting moisture into containers. Keep containers tightly closed.

8. Exposure Controls/Personal Protection

Exposure Limits: No OSHA or ACGIH exposure limits apply.

Engineering Controls: Provide general exhaust.

Personal Protective Equipment: Wear eye protection (e.g., chemical safety glasses) and rubber (e.g., nitrile) gloves.

Other Protective Measures: An eyewash and washing facility should be available in the work area.

9. Physical and Chemical Properties

Appearance: Liquid, off-white

Odor: Mild

Odor Threshold: No data available

pH: Not applicable

Melting Point: No data available

Boiling Point: No data available

Flash Point: No data available

Evaporation Rate: No data available

Flammable Limits: No data available

Vapor Pressure: No data available

Vapor Density: No data available

Relative Density: ~1.3 @ 25°C

Solubility: Insoluble in water

Partition Coefficient: n-octanol/Water: No data available

Auto-Ignition Temp: No data available

Decomposition Temp: No data available

Viscosity: 15,000 cP - 20,000 cP @ 25°C

10. Stability and Reactivity

Reactivity: Not normally reactive.

Chemical Stability: Stable under recommended conditions.

Possibility of Hazardous Reactions: None known.

Conditions to Avoid: Excessive heat.

Incompatible Materials: Possibly strong oxidizers.

Hazardous Decomposition Products: Thermal decomposition will generate formaldehyde and oxides of carbon and silicon.

11. Toxicological Information

Eye Contact: May cause mild irritation.

Skin Contact: May cause mild irritation especially to mucous membranes.

Inhalation: Vapors or mists may cause mild respiratory irritation.

Ingestion: No data available.

Chronic Health Effects: None known.

Acute Toxicity Values: No data available.

Germ Cell Mutagenicity: Components are not known mutagens.

Carcinogenicity: Relevant components are not listed as known or suspected carcinogens by NTP, IARC or OSHA.

Reproductive Toxicity: Relevant components are classified as reproductive toxins.

Specific Target Organ Toxicity: Relevant components are not known or suspected toxins to specific target organs.

12. Ecological Information

Ecotoxicity: Not expected to be dangerous to aquatic organisms. Do not release into waterways.

Persistence and Degradability: No data available.

Bioaccumulative Potential: No data available.

Mobility in Soil: No data available.

13. Disposal Considerations

Dispose according to local, regional and national regulations.

For U.S.: Upon disposal, these products are not RCRA hazardous waste (per 40 CFR 261).

14. Transport Information

Not regulated for transport in any mode.

Emergency Shipping Information: Call CHEMTREC, 800-424-9300 or +1-703-527-3887

15. Regulatory Information

U.S. FEDERAL REGULATIONS:

CERCLA 103 Reportable Quantity: Not subject to reporting under CERCLA. Some states have more stringent reporting requirements. Report all spills in accordance with local, state, and federal regulations.

SARA TITLE III:

Hazard Category for Section 311/312: Chronic Health

Section 313 Toxic Chemicals: Contains no chemicals subject to SARA Title III Section 313 Reporting requirements.

Section 302 Extremely Hazardous Substances (TPQ): None

EPA Toxic Substances Control Act (TSCA) Status: All components are listed on TSCA.

STATE REGULATIONS:

California Proposition 65: These products do not contain substances known to the State of California to cause cancer and/or reproductive harm.

16. Other Information

Training Advice: All personnel using/handling these products should be trained in proper chemical handling and the need for and use of engineering controls and protective equipment.

Recommended Uses and Restrictions: Intended for industrial or professional use only.

SDS Revision Notes: GHS Format, August 13, 2019

Disclaimer: The information contained herein is considered accurate; however, Alumilite makes no warranty regarding the accuracy of the information. The user must determine the suitability of the product for the intended use and accepts all risk and liability associated with that use.

Alumilite Corporation

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