Polyurethane Foam Information and Instructions:

About Polyurethane Foams:

Our foams come in two mixes, soft foam and rigid foam. Both must be mixed accurately by weight in order for them to cure. The kit comes with two parts, Part "A" which is often the Polyol "side" and part "B" which is the "Isocyanate" side. Please see the information sheet and instructions on the can for details on safe handling for both.

A few years ago polyurethane foams were made with fluorocarbons, but environmental concerns and legislation have changed that. Now polyurethane is made so that it can be "Blown" with water. The result is a higher cost for the basic material and an inconsistent skin. If a good skin is required you can cast the foam into a latex skin or paint it afterwards. Paint urethane with urethane based paint. Urethane sticks to everything so don't get it where it doesn't belong. **Don't breath the vapors! Ever.**

Isocyanates are also hydroscopic, which means they will absorb moisture out of the air. Don't leave your containers open. Water contaminated polyurethane will have white streaks in it.

Soft Foams:

Soft foam is the same as polyurethane foams used in car seats and camping pads used by hikers, except that it is in liquid form rather than cut sheets. Liquid foam is difficult to get and therefore more expensive. It can be cast in molds or shaped later. It is a common practice to pour foam into containers and shape it later with an electric carving knife and or a pneumatic sanding disc. Some people save material costs by mixing chunks of store bought furniture foam with a liquid batch of A + B foam. Use soft foam to fill latex masks, and to make stunt props.

Rigid Foam:

Rigid foam is the same foam that is used for boat floatation, but with a slower mix time so you can mix it by hand. After it cures it can be cut and sculpted but will release dangerous gasses. Please refer to the safety section of this packet for details. Rigid polyurethane foam is often used in the movie industry for large sculpted decorations and props.

Mixing:

A mixing ratio is given on the can. Soft foam is usually a ration of 28 to 72 parts by weight, but this can change, so be sure to follow the instructions on the container. Rigid foam is often a ratio of 50 to 50 parts by weight. Often when mixing rigid foam, a person can measure by volume and it will be close enough. With either foam, if you don't get the mixture right you will either end up with a gooey mess or a very long cure time. A gram scale that measure to 1 gram seems to be accurate enough. We sell the scales or you can borrow one from the school laboratory or your local drug dealer. The temperature of the mold, the product and the air must be above 70 degrees Fahrenheit. Once, some friends of mine mixed up a big batch of foam and poured it into a mold that was sitting on a cold concrete floor. It never came up nor cured. They

could have solved the problem by placing the mold on a wooden table up off the ground and by keeping the heater on over night. On the other hand, mixing these foams on a hot day will cause them to "kick" too quickly and foam too much.

Molds:
Any kind of mold can be used to cast soft or rigid foam as long as the proper release agent is used. Silicone based release agents work well, but can't be painted. PVA works well but must be washed off. Rocket Release works well, and can be painted but is not the best. If you are casting polyurethane in a silicone mold, expect some deterioration of the mold as the polyurethane pulls chemicals out of the silicone mold. Mold life can be from one part to several hundred depending on the release agent used, the design of the mold and how long the part remains in the mold after it is cured. To foam a good skin on the foam, swirl the liquid foam around the inside of the mold before it starts to expand. Let the foam expand from the outside inward. Make sure the mold is well vented or it will split apart.

Painting:
Few paints stick to cured polyurethane. I personally will buy some clear polyurethane clear coat at the hardware store and mix tinting agent with it for color. Polyurethane will adhere to polyurethane and will be durable especially if given enough time to dry and form a chemical bond to the original part.

You can't mix tinting agents with polyurethane foam before it expands because the expansion will dilute the color, just like a balloon starts dark red but becomes pale as it expands. Also, tinting agents have the tendency to affect the curing time.

Please refer to MSDS documents for more specific safety information:

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