



HANDLING GUIDE FOR SHORE A AND SHORE D POLYURETHANE ELASTOMER SYSTEMS

B.J.B. formulates its product lines to provide exceptional cured properties with good handling at room temperature. However a post cure with heat will provide maximum cured properties. These products are designed with safety curing agents and none of the products contain MOCA. Like all thermoset polyurethane casting systems they can react with atmospheric moisture to produce foaming during cure. We recommend reading this guide, the technical data sheet and the MSDS prior to using materials for best results.

CONTAINERS

It is recommended that if materials are to be stored after using a portion of a container, that a dry nitrogen blanket be applied prior to re-sealing the container. Dry nitrogen can be obtained from welding supply companies in different size cylinders. When blanketing from a gas cylinder, use a flexible rubber hose and lower the end of the hose close to the level of the material. Open the tank regulator and allow the nitrogen to flow over the surface of the material, giving adequate time to purge the air from the container before resealing the lid.

STORAGE

Store both resin and hardener components in an area where the temperature is between 70°-100°F (21°-38°C). When first using the material, a sample should be visually inspected to be sure no crystallization is present. Crystallization of either the resin or hardener can occur during shipment in cold weather. If the resin appears cloudy or the hardener becomes gummy, the component should be warmed to 120°-160°F (49° - 71°C) and stirred until the material returns to its proper smooth liquid consistency.

Drums or five-gallon pails should be stored on pallets to prevent cold flooring from lowering the material temperature.

MIXING

Use only metal or plastic mixing containers and spatulas. Paper tubs and wooden stir sticks have been known to contaminate the ingredients during mixing as they are porous and can absorb moisture in storage. Power mixing is advisable with the use of a "Jiffy Mixer"® or equivalent type of mixer. This type of mixer is designed to reduce the introduction of air during mixing provided there is enough material that the mixing head remains submerged in the liquid.

Cured urethane will generally not adhere to polyethylene mixing containers or spatulas. This allows them to be reused.

Accurate weighing of the resin and hardener components is a "must" for good results. Using package weights or proportioning by "eyeball" can result in failure. Mix until a thorough blend is achieved. With low viscosity liquids, this normally takes from 1 to 2 minutes. Heavier viscosities may require up to 3 minutes of mixing, particularly when mixing by hand. After the materials are thoroughly mixed, it is wise to transfer the material into a second pouring container and remix, because it is nearly impossible to mix the layer of resin or hardener which comes into contact with the container surface during weighing. In large use applications, it is advisable to consider automatic metering and mixing equipment.

DEAERATION

When air-free castings are required, the mixture should be placed in a vacuum chamber under 28-30 inches of mercury. Allow headroom in the container, as the material can expand to two or three times the original volume as the bubbles rise. It is recommended to have a viewing window so that material can be observed during degassing. Vacuum deaeration will also help strip a certain amount of moisture from the material, again allowing for bubble-free castings.

The use of an anti-foam agent may be required to assist in the vacuum degassing/deaeration of some material systems. Refer to individual product data sheets for the anti-foam of choice for the product to be processed. The anti-foam (often called surfactant) is designed to lower the surface tension of the mixed polyurethane material system by adding a very small amount (1-2 drops per 100 gms.) just prior to using vacuum.

MOLDS

Molds can be made from several different types of substrates including silicone RTV's, polyurethanes, epoxies, polyesters, wood, plaster and metal. Silicone RTV molds are the most common medium used for prototyping, art work, model kits, and short run production applications. Epoxy, polyester, and metal molds are generally associated with production tooling.

Material should be cast into dry, non-porous molds. Molds made of wood or plaster that contain moisture will cause foaming. The bubbles formed during the cure of the material are normally caused by moisture in the mold reacting with the polyurethane, which creates CO₂. This bubble formation is not entrapped air or malfunctioning of the polyurethane, but rather a gas caused by chemical reaction.

Release agents must be used when casting into a mold so the urethane can be removed without bonding. In most instances this process can be disregarded when using a silicone RTV mold. Many types of release agents are available for different application methods. It is advisable to contact a BJB technical representative for help in selecting the proper release for your application.

CURING

Demold time can be accelerated by heating the resin and hardener components and/or by heating the mold prior to mixing and casting. Work time is reduced when operating at greater than room temperature. Normal room temperature cure, 77°F (25°C), for seven days will develop a high percentage of physical properties. Your B.J.B. technical representative can recommend accelerated cure schedules. Typical physical properties are achieved after first gelling at room temperature, then post curing for sixteen hours at 180°F (82°C).

Some polyurethane systems can be cured directly by subjecting the liquid casting to a heat cure. Normally, this will increase the shrinkage. The least amount of shrinkage is encountered when the casting is gelled firmly at room temperature prior to heat curing.

Thickness (cross-section) and configuration of the casting will also influence the amount of shrinkage. Usually the shrinkage can be allowed for with the use of risers to act as reservoirs in a closed mold situation.

HAZARD POTENTIAL

Breathing of mist or vapor

Skin contact

Eye Contact

Improper Handling, such as spills, etc.

Disposal of Empty Containers

Fire and Heat

PREVENTIVE MEASURES

Mist or vapor can cause eye and skin irritation and possible allergenic respiratory reaction. Use only with adequate ventilation such as paint spray booth, fume hoods, exhaust fans, etc.

As contact with skin can cause irritation, avoid these occurrences by using appropriate protective rubber clothing, gloves, face shield, or other items as required.

Use goggles, face shield, safety glasses, or other items as required. In case of eye contact, immediately flush excessively with water and obtain medical aid at once.

Keep containers closed when not in use. Do not use in areas where spillage can be exposed to heat or open flame. For resin spills, soak up with absorbent compounds, place in an open container and dilute with a water-ethanol solution prior to discarding. For hardener spills, handle in a normal manner.

For resin containers only. When contents are used, do not tightly reseal empty containers because of the possible reaction with water to form gas pressure in a closed container.

Do not expose to high temperatures. Extinguish any fires with CO₂ or dry chemical type extinguishers.