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TECHNICAL INFORMATION SHEET - POLYGEL®

SELF-THICKENING RTV LIQUID RUBBERS & PLASTICS, FOR BRUSH-ON OR SPRAYED MOLDS AND MOLD SHELLS
COVERED BY U.S. PATENT # 5,128,433

DESCRIPTION: Polygel® rubbers and plastics consist of two liquids, Part A and Part B, which after mixing one-to-one by weight or volume, immediately self-thicken and gel to a brushable or trowellable consistency, then cure overnight at room temperature to a flexible, tough RTV (room temperature vulcanizing) rubber or hard, strong plastic. They are ideal for molds and shells built up with a brush or spatula on vertical or overhead surfaces. Polygel® mold rubbers are recommended for evaluation as a mold material for plaster, cement and waxes as well as for limited casting with polyester, epoxy and polyurethane resins. Polygel® plastics are ideal for building mold shells (mother molds) over brushed or sprayed rubber molds. Polygel® products bond well to many surfaces and should be evaluated as adhesives and sealants. Polygel® 50 may be used to repair torn polyurethane molds and to bond such molds to backing material such as plywood.

POLYGEL® FEATURES:

Tough, with high strength	Good grease and oil resistance	Fast - one day molds
Easy 1:1 mix, by weight or volume	Good adhesion between coats	Good flow into fine detail
Long mold and shell storage life	Color coded mix indication	Good dimensional stability

Polygel® 40 yields the most liquid mix for best air bubble release and easiest brushing and cures to a Shore A Hardness of 40.
Polygel® 50 yields a thicker mix and cures to a tougher 50 Shore A Hardness. Polygel® 50 is a better adhesive than Polygel® 40.
Polygel® Spray 50 is designed for spray mold applications using meter-mix spray equipment such as the Model VS-3000 from Spray-Tech.
Polygel® Quick Spray 50 is a fast, sprayable mold rubber with a 1 minute working time and a 4-6 hour cure.
Polygel® Plastic 75 thickens to a paste with a 3 minute working time and cures to a hard plastic within about 8 hours.
Polygel® Shell is a sprayable plastic for creating mold shells, sprayed-up castings or surface hardcoats.

As the liquid components of Polygel® mold rubbers are stirred together, the mix changes color and thickens to a buttery, non-sag paste with a working time of about twenty minutes (1 minute for Quick Spray 50). A mold can be built up in two or three coats, each applied about one hour apart, so the mold can be finished in several hours. Polygel® Spray 50 and Quick Spray 50 can be sprayed continuously until the desired mold thickness is achieved. The rubber will cure overnight at room temperature (4-6 hours for Quick Spray 50) to a tough skin mold, which can be reinforced with fabric, if desired. They exhibit good adhesion to many Poly Urethane rubbers and may be used for repairing torn molds with fabric reinforcement. Polygel® mold rubbers are without equal for brushed or sprayed blanket molds and Polygel® plastics produce strong lightweight mold shells. Polygel® Spray 50, Polygel® Quick Spray 50 and Polygel® Shell sprayable plastic should be considered for larger surface area applications where brushing may be impractical.

MODEL PREPARATION: Porous models such as wood or plaster must be sealed to prevent penetration of the Polygel® into the pores of the material. Wax, lacquer, petroleum jelly, paint and most other coatings are suitable sealers. If shellac is used as the sealer, it must be thoroughly coated with release agent as Polygel® bonds tenaciously to shellac. Fresh, moist plaster must be sealed particularly well to insure a proper cure on the surface of the Polygel® mold. This may be accomplished with multiple coats of shellac or shellac coated with a Krylon spray. The sealed or non-porous model and other materials that will contact the Polygel® should then be sprayed or coated with a release agent such as Pol-Ease® 2300, which should be brushed out for thorough coverage. In every case where there is any question about the compatibility between the Polygel® and the prepared model surface, a test cure should be made on an identical surface to determine that complete curing and good release is obtained. Porous models must be vented from beneath to prevent trapped air from causing bubbles in the mold rubber. Polygel® plastics develop significant heat and should not be used directly over materials like petroleum jelly that could melt. Paste wax followed by Pol-Ease® 2300 is the best release combination for Polygel® plastics.

MIXING AND CURING: Parts A and B are ready to use from the container and should be at room temperature when mixed. Surfaces and air temperature should be above 60oF during application and for the entire curing period. Cool temperatures slow the cure while warm temperatures speed the cure.

Unopened containers are usable at least one year from date of shipment but both Parts A and B tend to absorb atmospheric moisture, thus should be used up as soon as possible after the container is opened. Once opened, containers should be resealed tightly.

Large air space and frequent opening of containers allows moisture in the air to spoil the Polygel® rapidly, sometimes causing the Part A to thicken and skin within a few days. Thickened Part A will not cure properly and should be discarded.

Weigh both parts into a suitable, clean container. Volume measurement can be used but is never as accurate as weighing. Stir together thoroughly, scraping the sides and bottom until a uniform mix is obtained. Carefully apply the mixed Polygel® over the dry, properly prepared model. When brushing Polygel® mold rubber, allow the first coat to cure enough so that the second coat will not disturb it (usually about an hour is adequate) then apply a second coat covering any thin spots in the first coat. Ideally a blanket mold should be at least 1/16 inch thick but not more than 1/4 inch, as too thick a layer of rubber causes difficulty turning a mold back on itself during demolding. Allow to cure 16 to 24 hours at room temperature prior to demolding or building the mother mold. Strength continues to develop for several more days. Polygel® Plastic-75 should be stirred rapidly and thoroughly. Most mixing should be accomplished in the ten seconds or so before the gelling begins while the mix is still liquid to minimize air entrapment. Mix only enough that can be applied during the working time. Polygel® Plastic-75 generates heat when mixed. Rubberized cotton gloves are recommended to ease handling of the hot container. Once mixed, dumping the thickened mix on the surface to be coated and quickly spreading into a thin layer will cool the mass and extend working time a minute or two. Do not try to demold Polygel® Plastic-75 until adequate cure time has elapsed as it may be somewhat brittle.

Polygel® Shell plastic is a rapid-setting liquid plastic designed for spray applications. Hand mixing this product is not recommended. When meter-mixed and sprayed one-to-one by volume, Polygel® Shell gells several seconds after contacting the surface being covered, then remains in a workable grease-like state for one minute. Shells or castings can be demolded in ~ 2 hours depending upon thickness and ambient temperature. Thicknesses less than 1/4" may require longer cure time. Polygel® Shell plastic can be sprayed to any desired thickness in one application. Thin, tough coatings can be applied to many surfaces such as carved foam. Mold shells should be approximately 1/4" thick. For additional strength, fiberglass strand or mat can be laid between layers of Polygel® Shell. For very large shell sections, supporting structures such as boards or metal rods can be attached to prevent warping or damage during use.

Rubber molds may be reinforced with open mesh cloth such as lightweight fiberglass cloth, cheese cloth or nylon. The fabric may be embedded in the second or third coat of rubber while tacky and covered with a subsequent coat which should be as fluid as possible for best penetration of the fibers of the cloth. Polygel® 40 is ideal for coating the cloth. The fabric should not be too close to the model surface or the weave pattern of the cloth may show through to the face of the mold.

LOW VISCOSITY RUBBER FOR FIRST COATS: For a bubble free first coat, Polygel® 40 should be used or Polygel® 50 may be thinned by combining with equal parts of Poly 74-30. This will yield a semi-liquid, easily brushable, mayonnaise consistency which allows bubbles to rise out. If Poly 74-30 is used to thin Polygel® rubbers, equal parts of Polygel® Part A and Poly 74-30 Part A must be combined and stirred together first, then equal parts of Polygel® Part B and Poly 74-30 Part B can be added and mixed in. Do not brush Polygel® 40 or 50 over Poly 74-30 as distortion can occur. If Poly 74-30 is used to begin with, the mold should be completed with Poly 74-30 thickened with Cab-O-Sil®.

THICKER MIXES FOR FILLING UNDERCUTS: Polygel® rubbers can be made even thicker by stirring Cab-O-Sil® into the mixed rubber.

USING THE MOLD: No release agent is necessary for casting plaster, cement or most waxes in Polygel® rubber molds, but with epoxy, polyurethane or polyester resins, a barrier coat or release agent is recommended. Polygel® rubber molds can be stored for many years in a cool, dark, dry place in a mother mold to maintain shape. Cured Polygel® rubber should not be exposed to sunlight or used in a prolonged contact with skin or foods.

If a Polygel® rubber mold is to be turned inside out like a sock, the outside surface must be lubricated with soapy water or petroleum jelly so it slides over itself easily. The shell or mother mold may be built of Polygel® plastics, plaster, polyester resin and fiberglass, Poly 15-6 or 1512X resin using Poly Fiber or fiberglass as described on page 18 in the Polytek® Moldmaking and Casting Methods and Materials Manual and Catalog. If the shell is built with Polygel® plastics or any other resin, be sure the rubber is thoroughly coated with paste wax then Pol-Ease® 2300 to prevent the plastic from sticking to the rubbber.

SAFETY and Cleanup: Before use, read product labels and Material Data Safety Sheet. Follow safety precautions and directions. Contact with uncured Polygel®. Avoid contact with skin and eyes. Use with adequate ventilation. Best method of cleanup is by wiping with disposable paper towels and washing with waterless hand cleaner, then soap and water. If solvents must be used, denatured ethyl alcohol is best, but should be handled with respect for health and flammability hazards.

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