Polytek Development Corp.

TECHNICAL BULLETIN

Polygel® Liquid Rubbers

U.S. Patent #5,128,433

Specially Formulated for Making Brush-On or Sprayed Molds

USES: Polygel® Liquid Rubbers are without equal for making brush-on or sprayed blanket molds. After mixing the A and B liquid components, Polygel products immediately develop a non-sag consistency, making them ideal for application to vertical or overhead surfaces. Sprayable Polygel products are best for large surface area applications where brushing may be impractical. Polygel rubber molds are suitable for casting plaster, concrete and waxes, as well as limited casting with polyester, epoxy and polyurethane resins. Since Polygel products bond well to many surfaces, they can also be used as adhesives and sealants.

DESCRIPTION: Polygel products consist of liquid Parts A and B, that after mixing 1A:1B by weight or volume, immediately thicken to a brushable or trowellable consistency. The working time varies, depending on which Polygel product, from1 to 20 minutes. To make molds with Polygel 35, 40 or 50, 2 to 3 coats of liquid rubber can be applied about 1 hour apart. To make molds with Polygel Spray 35, Spray 50 and Quick Spray 50, the liquid rubber can sprayed continuously until the desired mold thickness is achieved. Polygel 35 and Spray 35 cure in 6-8 hours at room temperature. Polygel 40, 50 and Spray 50 cure overnight to flexible, tough rubbers. Polygel Quick Spray 50 cures in 4-6 hours.

POLYGEL PRODUCT OPTIONS

Polygel® 35 - Brushable mix that cures to the softest, most elastic, Polygel rubber. Has a 15-minute working time. Cures to Shore A35 hardness in 6-8 hours.

Polygel® Spray 35 - Sprayable version of Polygel 35 designed for use with meter-mix spray equipment. Has a 10-minute working time. Cures to A35 in 6-8 hours.

Polygel® 40 - The most liquid mix for best air bubble release and easiest brushing. Has a 20-minute working time. Cures to A40 in 16 hours.

Polygel® 50 - A thicker mix that cures to a tough Shore A50 hardness. Has a 10-minute working time and a 16-hour cure time. Polygel 50 is a great adhesive for repairing polyurethane molds and bonding molds to backing material such as plywood.

Polygel® Spray 50 - Designed for spray application using meter-mix spray equipment. Has a 7-minute working time and a 16-hour cure time.

Polygel® Quick Spray 50 - A fast, sprayable rubber with a 1-minute working time and a 4 to 6-hour cure.

FEATURES

- Easy -- 1:1 mix by weight or volume
- Fast -- one-day, brush-on or sprayed molds
- Tough and strong
- Color-coded mix indication
- Good flow into fine detail
- Good dimensional stability

MODEL PREPARATION: Porous models (i.e., wood or plaster) must be sealed to prevent Polygel Liquid Rubber from penetrating 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 a release agent as Polygel rubber bonds tenaciously to shellac. Fresh, moist plaster must be sealed particularly well to ensure a proper cure on the surface of the Polygel mold. This can be accomplished with multiple coats of shellac, shellac coated with a Krylon® spray, or potter's soap. The sealed or non-porous model, and other materials that will contact the Polygel, should then be sprayed or coated with Pol-Ease® 2300 Release Agent, which should be brushed out for thorough coverage. If there is any question about the compatibility between the Polygel and the prepared model surface, perform a test cure on an identical surface to verify curing and good release. Porous models must be vented from beneath to prevent trapped air from causing bubbles in the mold rubber.

MIXING & CURING: Before use, be sure that Parts A and B are at room temperature and tools and molds or models are ready to go. Surfaces and air temperature should be above 60°F during application and for the entire curing period. Cool temperatures slow the cure; while warm temperatures speed the cure.

Weigh Parts A and B into a suitable, clean container. Volume measurement can be used; but, is never as accurate as weighing. Mix thoroughly, scraping the sides and bottom until the mix is uniform in color and consistency. Carefully apply the mixed Polygel over a dry, properly prepared model. When brushing Polygel, allow the first coat to cure enough so that the second coat will not disturb it (usually about 1 hour). Then apply a second coat being careful to cover any thin spots in the first coat. Do not allow prior layers to cure completely before applying subsequent coats. Ideally, a blanket mold should be at least 1/8-inch thick, but not more than 3/8-inch, since too thick a layer of rubber causes difficulty when turning a mold back on itself during demolding. Allow to cure at room temperature prior to demolding or building the mold shell. Strength continues to develop for several days.

Rubber molds can be reinforced with Tietex® Fabric, which is strong and wets out better than other fabrics. To reduce tearing, Tietex can be laminated at the top of a mold seam or strips can be laid around the perimeter of a mold. Embed the fabric in the second or third coat of rubber while it is still tacky and then cover with a subsequent coat of rubber, which should be as fluid as possible for best penetration of the fabric. Ensure that the Tietex is not too close to the model surface, so that the weave pattern does not show through to the face of the mold.

NOTE ON LAYERING DIFFERENT POLYGEL RUBBERS: Typically, brush-on molds should be completed with one product. For example, if the face coat is brushed with Polygel 40, then all subsequent coats should be with Polygel 40. In some cases, the initial coat can be brushed with lower-viscosity Polygel 35 or 40 for better detail, and the second (usually final) coat with thicker Polygel 50 to speed the mold making process. This technique is acceptable for molds that do not require long-term storage or use. When layering different products, oils can transfer from one rubber to another causing warping or curling of the mold. In extreme cases, a mold can distort enough that it will not fit in its shell.

THICKER MIXES FOR FILLING UNDERCUTS: If needed, Polygel Liquid Rubbers can be made even thicker by stirring fumed silica or Poly Fiber II into the mixed Parts A and B.

USING THE MOLD: No release agent is necessary for casting plaster, cement and waxes in Polygel rubber molds. But release agent or a barrier coat is recommended when casting epoxy, polyurethane or polyester resins. If a Polygel rubber mold is to be turned inside out like a sock, lubricate its outside surface with soapy water or petroleum jelly so that it slides over itself easily. The shell or mother mold can be made of plaster, polyester resin and fiberglass, or Polytek Liquid Plastics (e.g., Poly 15-6, 1511 or 1512X) filled with Poly Fiber II or fiberglass. (See Polytek Mold Making & Casting Manual & Catalog.) If the shell is built with Polytek Plastics or other resin, the rubber must be thoroughly coated with paste wax then Pol-Ease 2300 Release Agent, to prevent the plastic from sticking to the rubber. A plaster shell must be sealed with potter's soap, shellac, lacquer or wax to prevent mold distortion during storage or use.

Polygel molds can be stored for years in a cool, dark, dry place in a non-porous mother mold to maintain shape. Cured Polygel rubber should not be exposed to sunlight. Do not use Polygel rubbers in contact with skin or foods.

SAFETY: Before use, read product labels and Material Safety Data Sheets. Follow safety precautions and directions. Spray application of Polygel products should be conducted with suitable ventilation and personal protective equipment (i.e., respirators, gloves, coveralls). Contact with uncured products may cause eye, skin and respiratory irritation and dermal and/or respiratory sensitization. Avoid contact with skin and eyes. If skin contact occurs, remove with waterless hand cleaner or alcohol then soap and water. In case of eye contact, flush with water for 15 minutes and then seek medical attention. Use with adequate ventilation. Do not use Polygel products where food or body contact may occur. Polygel products burn readily when ignited.

STORAGE LIFE: At least six months in unopened containers stored at room temperature (60-90°F).

DISCLAIMER: The information in this bulletin and otherwise provided by Polytek is considered accurate. However, no warranty is expressed or implied regarding the accuracy of the data, the results to be obtained by the use thereof, or that any such use will not infringe any patent. Before using, the user shall determine the suitability of the product for the intended use and user assumes all risk and liability whatsoever in connection therewith.

Polygel® Packaging	
Product	Unit Weight
Polygel 35 Liquid Rubber Polygel 40 Liquid Rubber Polygel 50 Liquid Rubber	4 lb 16 lb 80 lb 900 lb
Polygel Spray 35 Liquid Rubber Polygel Spray 50 Liquid Rubber Polygel Quick Spray 50 Liquid Rubber	80 lb

ACCESSORIES

Fiberglass Mat
3 yd^2

Fumed Silica
5-gal pail, 10-lb bag

Poly Fiber II
3-lb pail

Pol-Ease® 2300 Release Agent
12-oz can, case of 12 cans

Poly Purge™
10-oz can, case of 12 cans

PolyColors - White, Red, Green, Yellow, Blue, Brown & Black
4-oz bottle (0.25 lb), 1.0 pint (1.0 lb)

Tietex® Fabric
10-ft sheet, 324-ft roll (40-in wide)

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