

Poly 74-Series Liquid Rubbers

Technical Bulletin

DESCRIPTION: Poly 74-Series Liquid Rubbers consist of two parts (A and B), which, after mixing, cure at room temperature to flexible, high-strength, mold rubbers. Poly 74-Series Rubbers make durable, easy-releasing molds for casting plasters and waxes without release agents. When Poly 74-Series molds are properly prepared, they are also excellent for casting concrete and various resins, such as epoxy, polyester, polyurethane and acrylic.

MODEL PREPARATION: Porous models, such as wood, plaster, stone, pottery or masonry must be sealed. Multiple coats of paste wax dried and buffed will seal most surfaces. Potters soap can be used as a sealer for plaster. Lacquer, paint, PVA, and Pol-Ease® 2350 Release Agent also work well as sealers for many surfaces. The properly-sealed model should then be coated with a release agent (e.g., Pol-Ease® 2300 Release Agent). Alternatively, PolyCoat, a sealer and semi-permanent release agent, can be used on most porous or non-porous models. Porous models must be vented from beneath to prevent trapped air from forming bubbles in the rubber.

Models made of sulfur-containing modeling clay (e.g., Roma Plastilina) should be sealed with shellac. [CAUTION: When shellac is used as the sealer, it must be thoroughly coated with release agent because polyurethane rubbers bond tenaciously to shellac.]

Non-porous models (e.g., metals, plasticine, wax, glazed ceramics, fiberglass and polyurethanes) should be coated with release agent such as Pol-Ease® 2300 Release Agent or PolyCoat.

If there is any question about the compatibility between the liquid mold rubber and the prepared model surface, perform a test cure on an identical surface to determine that complete curing and good release are obtained.

MIXING AND CURING: Before use, be sure that Parts A and B are at room temperature and that all tools are ready. Surface and air temperatures should be above 60°F during application and for the entire curing period.

Check mix ratio. Several Poly 74-Series Part Bs require stirring before use (i.e., 74-20, 74-29, 74-30 and 74-40). Weigh Part B into a clean metal or plastic mixing container and then weigh the appropriate amount of Part A into the same container. Mix thoroughly. Hand mixing with a Poly Paddle is best to avoid mixing air into the rubber. While mixing, scrape the sides and bottom several times to ensure thorough mixing. Pour the rubber as soon after mixing as possible for best flow and air bubble release. Vacuum degassing helps to provide bubble-free molds, but is usually not necessary.

Allow rubber to cure at room temperature, 77°F (25°C). Carefully demold after approximately 16 hours. Final cure properties are obtained in about seven days, but molds may be used with care after curing for 24-48 hours. Heat accelerates the cure -- low temperatures slow the cure. Avoid curing in areas where the temperature is below 60°F (15°C).

Flexible, High-Strength, Polyurethane Mold Rubbers

Why Choose Poly 74-Series Rubbers?

- Make durable, long-lasting molds owing to strength and elongation properties of cured rubber
- Pourable liquid rubbers that cure to soft to mid-range hardnesses
- Easily thickened for brush-on applications
- No release agents needed when casting many plasters, waxes and concretes
- Low-viscosity liquid rubbers capture detail from intricate masters

Both Parts A and B react with atmospheric moisture and, therefore, should be resealed or used up as soon as possible after opening. Before resealing, Poly Purge, a heavier-than-air, dry gas, can be sprayed into open containers to displace moist air and extend storage life. For 55-gallon drums of Parts A and B, affix Drierite® cartridges on the small bung during dispensing to protect product from moist air entering the drum.

SOFTENING THE RUBBER: Add Poly 74/75 Part C Softener to 74-Series products for a lower viscosity mix and a softer cured rubber. When Part C is used, cure time is longer and there is some loss of strength in the rubber and increased tendency to shrink after repeated castings. To soften Poly 74-30 to Shore A15, mix 1A:1B:1C by weight. The quantity of Part C required to soften other products varies and should be determined through experimentation.

ACCELERATING THE CURE: Cure time can be shortened with the addition of an Accelerator, such as Poly 74/75 Part X, or by adding heat. Part X is most useful when making brush-on molds to decrease the time needed between coats. By adding 3% Part X (by weight of the total mix) to 74-30 or 74-29, the working time is reduced to approximately 8 minutes -- in the time it takes to mix the next batch, the previous layer gels enough to apply the next coat. Demolding is possible in as little as 4 hours after the final layer is applied. Rapid curing with Part X allows a shell or mother mold to be made in the same day. Exercise caution when using Part X for poured molds since the rapid onset of gelling may trap air bubbles on or near the surface of the master. Heat also accelerates the cure. It is recommended not to exceed 140°F (60°C).

PHYSICAL PROPERTIES

	74-20	74-24	74-29/ 74-29 White	74-30/74-30 Clear /74-30 HT	74-40	74-41	74-44	74-45	74-55
Mix Ratio By Weight	1A:2B	1A:1B	1A:1B	1A:1B	2A:1B	1A:1B	2A:1B	1A:1B	4A:1B
Shore Hardness	A20	A25	A30	A30	A40	A40	A45	A45	A55
Pour Time (min)	30	20	30	25-30	20	20	20	30	15
Cured Color	Yellow	Amber	Black/ Off-White	Varies	Varies	Varies	Gray	Yellow	Amber
Mixed Viscosity (cP)	800	2,000	2,800	2,000	3,400	2,000	3,500	2,500	4,000
Specific Volume (in ³ /lb)	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5

THICKENING FOR BRUSH-ON: Add Poly Fiber II or Fumed Silica to mixed Parts A and B to thicken the liquid mix to a gel for application by brush or trowel.

USING THE MOLD: Typically, no release agent is necessary when casting plaster or wax in Poly 74-Series molds. For casting plaster: sponge, dip or spray the mold with Pol-Ease® Mold Rinse and then pour plaster on the wet mold to reduce air bubbles in the plaster and aid release. For casting resin, first spray the mold with Pol-Ease® 2300 Release Agent or PolyCoat. For casting concrete, use a form release, such as Pol-Ease® 2650 or 2601. Avoid solvent-containing releases since they can cause mold distortion (i.e., shrinkage or swelling).

After repeated casting with certain resins, plaster and concrete, molds may shrink slightly since these materials extract oils from the mold. The proper selection of release agent and/or barrier coat can minimize this effect. If shrinkage becomes evident, a light application of Pol-Ease® Mold Dressing can help to restore the mold to its original dimensions.

Poly 74-Series molds last many years if stored undistorted on a flat, non-porous surface in a cool, dry location out of direct sunlight. If occasional outdoor use is required, add 0.5% UV Additive to the total mix weight to reduce the characteristic surface degradation caused by sunlight. Never store Poly 74-Series molds outside as UV exposure will eventually degrade the rubber.

CLEAN UP: Wipe tools clean before the rubber cures. Denatured ethanol is a good cleaning solvent, but is highly flammable and must be handled with caution. Coat work surfaces with wax, Pol-Ease® 2300 Release Agent or PolyCoat so that cured rubber can be easily removed.

SAFETY: Before use, read product labels and Safety Data Sheets. Follow safety precautions and directions. Use only with adequate ventilation. 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, and then soap and water. In case of eye contact, flush with water for 15 minutes and call physician. Poly 74-Series products are not to be used where food or body contact may occur. Poly 74-Series rubbers burn readily when ignited.

SHELF LIFE: For best results, store products in unopened containers at room temperature (60-90°F/15-32°C). Use products within six months. Part Bs darken with age, but product performance is not affected.

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.

Accessories:

Accelerator

Poly 74/75 Part X Accelerator - 1 lb, 8 lb

Sealers & Release Agents

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

Pol-Ease® 2350 Release Agent - 1.5 lb, 26 lb

Pol-Ease® 2450 Release Agent - 1.5 lb, 30 lb

Pol-Ease® 2601 Release Agent - 2 lb, 40 lb

Pol-Ease® 2650 Release Agent (Silicone-Free) - 1.5 lb, 35 lb

Pol-Ease® 2500 Release Agent - 12-oz can, case of 12

PolyCoat Semi-Permanent Sealer/Release - 1qt, 1 gal

Pol-Ease® Mold Dressing - 40 lb

Pol-Ease® Mold Rinse - 40 lb

Poly PVA Solution (Green or Clear) - 2 lb, 40 lb

Softener

Poly 74/75 Part C Softener - 1 lb, 8 lb, 40 lb

Product Life Extender

Poly Purge Aerosol Dry Gas - 10-oz can, case of 12

Thickeners

Fumed Silica - 5-gal pail, bag (~10 lb)

Poly Fiber II - 1-gal pail, 5-gal pail, bag (15 lb)

UV Stabilizer

UV Additive - 4-oz bottle, 1-pint bottle (1 lb)

Reinforcement Material for Blanket Molds

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

PACKAGING

Product(s)	Kit Size (lb)	Part A		Part B	
		Weight (lb)	Volume*	Weight (lb)	Volume*
Poly 74-20 Mix Ratio: 1A:2B	6.0	2.0	1 qt	4.0	2 qt
	24.0	8.0	1 gal	16.0	2 gal
	120	40	5 gal	80	10 gal
	1,350	450	55 gal	900	110 gal
Poly 74-30, 74-30 Clear, 74-41, 74-45 Poly 74-24, 74-29, 74-29 White, 74-30 HT (not available in 4-lb kits) Mix Ratio: 1A:1B	4.0	2.0	1 qt	2.0	1 qt
	16.0	8.0	1 gal	8.0	1 gal
	80	40	5 gal	40	5 gal
	900	450	55 gal	450	55 gal
Poly 74-40, 74-44 Mix Ratio: 2A:1B	24.0	16.0	2 gal	8.0	1 gal
	120	80	10 gal	40	5 gal
	675	450	55 gal	225	27 gal
	1,350	900	110 gal	450	55 gal
Poly 74-55 Mix Ratio: 4A:1B	5.0	4.0	2 qt	1.0	1 pt
	20.0	16.0	2 gal	4.0	2 qt
	40	32.0	4 gal	8.0	1 gal
	100	80	10 gal	20.0	2.5 gal
	562.5	450	55 gal	112.5	14 gal

*Volume measurements are approximate. ^Only Poly 74-30, 74-30 Clear, 74-41 and 74-45 are available in 4-lb kits.