

PT Flex Liquid Rubbers - New & Improved

Technical Bulletin

DESCRIPTION: PT Flex Liquid Rubbers are flexible, fast-curing rubbers, for use in prototyping and model making applications. They are excellent for casting decorative objects, production parts, tools, models, patterns, duplicate masters and more. With the addition of PolyColor Dyes, PT Flex products can be used to cast parts of any color.

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.

ATTENTION: Do not mix with previous versions of PT Flex Liquid Rubber; the product name must include "New & Improved."

Fast-Curing, Pourable Polyurethane Casting Rubbers

Why Choose PT Flex Liquid Rubbers?

- Easy 1A:1B mix formulations
- Low viscosity
- Reproduces fine detail
- Low shrinkage on cure
- Rapid demold time
- Castable in large masses

Check mix ratio. Shake or stir Part B if directed by the product label. 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.

Allow rubber to cure at room temperature, 77°F (25°C). Carefully demold after the listed "demold time". Final cure properties are obtained in about seven days. Heat accelerates the cure -- low temperatures slow the cure. Avoid curing in areas where the temperature is below 60°F (15°C).

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.

PHYSICAL PROPERTIES

	PT Flex 20	PT Flex 50	PT Flex 60	PT Flex 70	PT Flex 85	PT Flex D60
Mix Ratio By Weight	1A:1B	1A:1B	1A:1B	1A:1B	1A:1B	2A:1B
Shore Hardness	A20	A50	A60	A70	A85	D60
Pour Time, 1-lb mix (min)	4	5	5	4	5	10
Demold Time at 78°F (hr)	2	2	2	2	2	16
Demold Time at 70°C (min)	30	30	30	30	30	ND
Specific Gravity	1.00	1.03	1.03	1.05	1.06	1.03
Cured Color	Tan	Yellow/Amber	Yellow/Amber	Yellow/Amber	Yellow/Amber	Amber
Initial Mixed Viscosity (cP)	520	450	600	700	750	3,000
Specific Volume (in ³ /lb)	27.5	26.9	26.9	26.4	26.2	26.9
Shrinkage Upon Cure (in/in)	0.0050*	0.0020*	0.0025*	0.0046*	0.0016*	0.0024*
Tensile Strength (psi)	250	250	345	730	1064	3140
Elastic Modulus (psi)	85	160	190	915	2700	52,020
Elongation (%)	770	200	235	175	250	130
Tear Strength (pli)	50	50	70	130	190	790

*Shrinkage is primarily caused by gelling while hot then cooling. Parts that cure with minimal temperature rise exhibit minimal strength.

To obtain the physical properties reported above, cure schedule is 16 hours at 140°F (60°C).

SOFTENING THE RUBBER: Add Poly 74/75 Part C Softener to PT Flex products for a lower viscosity mix and a softer cured rubber. When using Part C, cure time is longer and there is some loss of strength in the rubber and increased tendency to shrink after repeated castings. Perform small-scale experiments to determine the best amount of Part C to use.

ACCELERATING THE CURE: Poly 74/75 Part X Accelerator can be added to increase the speed of curing, but working time may be reduced dramatically. Heat also accelerates the cure. It is recommended not to exceed 140°F (60°C). Perform small-scale experiments to determine the best amount of Part X to use.

THICKENING FOR BRUSH-ON: Add PolyFiber 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 PT Flex 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.

PT Flex 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 PT Flex 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. PT Flex products are not to be used where food or body contact may occur. PT Flex 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 - 1 qt, 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)
- PolyFiber 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*
PT Flex 20, 50, 60, 70 & 85 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
PT Flex D60 Mix Ratio: 2A:1B	120	80	10 gal	40	5 gal

*Volume measurements are approximate.