Polytek Development Corp.

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PT Flex Liquid Rubbers

Technical Bulletin

DESCRIPTION: PT Flex products are two-component, fast-setting polyurethane rubbers that cure at room temperature (RTV). Available in a variety of hardnesses, these products are excellent for prototyping and model making applications and for the casting of production parts, props, tools, and more.

BEFORE USE: Thoroughly read Safety Data Sheets, product labels and the "SAFETY" section in this Technical Bulletin.

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 rubber and the prepared model surface, perform a test cure on an identical surface to determine that complete curing and good release are obtained.

PRODUCT LINE FEATURES

- Room Temperature Curing (RTV)
- Easy 1A:1B mix formulations
- Low viscosity
- Reproduces fine detail
- Low shrinkage on cure
- Rapid demold time
- Castable in large masses

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. 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, 73°F (22.7°C). Carefully demold after the listed "demold time". Final cure properties are obtained in about seven days. Heat accelerates the cure and 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

PHYSICAL PROPERTIES

Product	PT Flex 20	PT Flex 50	PT Flex 60	PT Flex 70	PT Flex 85
Mix Ratio By Weight	1A:1B	1A:1B	1A:1B	1A:1B	1A:1B
Shore Hardness	A25	A50	A55	A70	A85
Pour Time, 1-lb mix	4 min.	4 min.	5 min.	4 min.	5 min.
Demold Time at 73°F	2 hr.	2 hr.	2 hr.	2 hr.	2 hr.
Demold Time at 158°F	30 min.	30 min.	30 min.	30 min.	30 min.
Specific Gravity	1.01	1.03	1.04	1.05	1.06
Cured Color	Tan	Yellow/Amber	Yellow/Amber	Yellow/Amber	Yellow/Amber
Initial Mixed Viscosity (cP)	975	600	760	800	1,200
Specific Volume (in^3/lb)	27	26.9	26.2	26.4	26.2
Shrinkage Upon Cure (in/in)	0.0050*	0.0020*	0.0025*	0.0046*	0.0016*
Tensile Strength (psi)	177	284	310	458	842
Elongation (%)	501	242	222	142	183
Tear Strength (pli)	46.7	57.2	71.0	148.7	194.2

*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).

opening. Before resealing, PolyPurge, a heavier-than-air, dry gas, can be sprayed into open containers to displace moist air and extend storage life.

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.

COLORS: Add PolyColor Dyes to PT Flex Liquid Rubber Part B before mixing with Part A to create unique rubber color. Add up to 0.5% PolyColor Dye of the total mixed weight when using PolyColor Black, Brown, Blue, Green, Red and Yellow. Add up to 2% PolyColor Dye of the total mixed weight when using PolyColor White and Fleshtone.

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 apply Pol-Ease® 2300 Release Agent or PolyCoat Sealer & Release Agent. For casting concrete, use a form release, such as Pol-Ease® 2650 or 2601 Release Agent. 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.

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

SAFETY: Before use, thoroughly read Safety Data Sheets and product labels. Follow safety precautions and directions.

Part A: Keep out of reach of children. Do not breathe fumes, vapors or mists. Use with adequate general or local exhaust ventilation to minimize exposure levels. If needed, a NIOSH-approved respirator with organic vapor cartridge may be used. If inhaled, remove person to fresh air and keep comfortable for breathing. Wear impervious gloves, such as butyl rubber or nitrile rubber. Wash thoroughly with soap and water after handling. If skin irritation occurs, get medical help. Wear eye protection, such as chemical safety glasses/googles. If in eyes, rinse cautiously with water for several minutes, removing contact lenses if present and easy to do. If eye irritation occurs, get medical help.

Part B: Keep out of reach of children. Avoid breathing fumes, vapors or mists. Use with adequate general or local exhaust ventilation to minimize exposure levels. If needed, a NIOSH-approved respirator with organic vapor cartridge may be used. Wear impervious gloves, such as butyl rubber or nitrile rubber. Wash thoroughly with soap and water after handling. Contaminated work clothing should not be allowed out of the workplace. Take off contaminated clothing and wash it before reuse. If skin irritation or rash occurs, get medical help. Wear eye protection, such as safety glasses/goggles. If in eyes, rinse cautiously with water for several minutes, removing contact lenses if present and easy to do. If eye irritation occurs, get medical help. If spilled, collect spillage and avoid release to the environment.

DISCLAIMER: The information in this bulletin and otherwise provided by Polytek® Development Corp. 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

Sealers & Release Agents
Pol-Ease® 2300 Release Agent
Pol-Ease® 2350 Release Agent
Pol-Ease® 2450 Release Agent
Pol-Ease® 2601 Release Agent
Pol-Ease® 2650 Release Agent
Pol-Ease® 2500 Release Agent
PolyCoat Sealer & Release Agent
Pol-Ease® Mold Dressing
Pol-Ease® Mold Rinse
Poly PVA Solution (Green or Clear)

Softener
Poly 74/75 Part C Softener

Product Life Extender
Poly Purge Aerosol Dry Gas

Thickeners
Fumed Silica
PolyFiber II

UV Stabilizer
UV Additive

Reinforcement Material
Tietex® Fabric

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