

PlatSil® 73-Series Silicone Rubbers Technical Bulletin

DESCRIPTION: PlatSil® 73-Series Liquid Silicone Rubbers are two-component, room temperature curing mold rubbers. PlatSil silicone rubbers are platinum-catalyzed, which, unlike tin-catalyzed systems, do not shrink on cure or deteriorate over time. Molds made from PlatSil rubbers offer good chemical resistance, making them a good choice when planning to cast polyesters, polyurethanes (plastic, foam, rubber), epoxies and more. PlatSil rubbers offer excellent release properties, making release agents unnecessary in many applications. Polytek offers additives to vary the viscosity and cure time of the liquid rubber, as well as hardness and color of the cured rubber.

MODEL PREPARATION: Porous models must be sealed to prevent the rubber from penetrating the surface. Seal porous models (e.g., wood or plaster) with wax, petroleum jelly, PVA, lacquer or paint to prevent penetration of the rubber into the pores of the material. Some surfaces (e.g., metals and glass) that contact the liquid rubber should be coated lightly with Pol-Ease® 2350 Release Agent or sprayed with Pol-Ease® 2500 Release Agent. Pol-Ease 2350 is both a sealer and release agent and must be allowed to dry before applying liquid rubber. Pol-Ease 2500 is an aerosol spray and does not need to dry before applying liquid rubber. If there is any question about the release properties of PlatSil rubbers against a certain material, perform a small test cure on an identical surface. PlatSil rubbers usually bond to cured silicone rubbers unless a release agent, like Pol-Ease 2500, is used. Do not use silicone-based release agents (e.g., Pol-Ease® 2300 Release Agent) on surfaces that contact liquid PlatSil rubbers since inhibition and/or adhesion may occur.

Once sealed and positioned for mold making, vent porous models from beneath to allow trapped air to escape and to prevent air from migrating into the rubber.

CURE INHIBITION: CAUTION! Contamination from amines, sulfur, tin compounds, polyester resins, some paints and some silicone rubbers may inhibit surface cure. Modeling clays containing sulfur are one example. If there is any question about the compatibility between the 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.

Read product labels to determine the correct mix ratio and if pre-mixing of Part A or Part B component is required. Carefully weigh Part B and then Part A in proper ratio into a clean mixing container. Accurate weighing is essential to obtain the optimum physical properties from the cured rubber. Mix thoroughly, scraping sides and bottom of the container.

To ensure a bubble-free mold, it may be necessary to deaerate the liquid rubber under vacuum at 28-29 inches mercury. Evaluate the need for vacuum on a case-by-case basis. Do not attempt to vacuum fast-setting PlatSil 73-

High-Performance Silicone Rubbers

Why Choose PlatSil® 73-Series Rubbers?

- Low viscosity for excellent reproduction of details and easy degassing
- Easy mix ratios; can use with dispensing machines
- Cure at room temperature or accelerate with heat
- Easy release properties; save on release agents
- High tear strength; fewer prematurely torn molds
- Good chemical resistance for longer mold life
- Low/zero shrinkage for better dimensional reproduction
- Range of hardness from A15 to A60

20. If vacuum is used, mix Parts A and B in a mixing container three to four times larger than the volume of rubber and deaerate until the mass of rubber rises and then collapses and continue for an additional two minutes. Pour the rubber as soon as possible after mixing/vacuuming for best flow and air bubble release.

If reinforcement of the rubber is needed (e.g., thin blanket molds), place open mesh nylon, dacron cloth, or TieTex® Fabric into the uncured rubber. Be sure that the fabric is not too close to the mold surface or the weave of the cloth may show through to the face of the mold.

At room temperature (~77°F), PlatSil 73-Series rubbers cure to full hardness in the specified demold time. At higher temperatures, they cure faster. At lower temperatures, more time may be needed to reach full hardness. Curing below 60°F is not recommended.

USING THE MOLD: No release agent is necessary for casting most materials in PlatSil 73-Series molds, but for longer mold life with epoxy, polyurethane or polyester resins, a barrier coat or release agent (e.g., Pol-Ease 2300 Release Agent or Pol-Ease 2500 Release Agent) is recommended. Properly cured PlatSil 73-Series molds last for years without deterioration.

ACCELERATING THE CURE: Cure time can be shortened with the addition of an Accelerator, such as PlatSil® 71/73 Part X Accelerator or by placing the curing rubber in a warm area (do not exceed 140°F). Weigh and add 71/73 Part X to Part B and mix. Then weigh and add Part A and mix thoroughly. Pour over a properly prepared model as soon after mixing as possible. Demold when tack-free. The addition of 1% Part X to the total mixed weight of Parts A+B

PHYSICAL PROPERTIES

| | 73-15 | 73-20 | 73-25 | 73-29 | 73-40 | 73-45 | 73-60 |
|---------------------------------------|-------------------|------------------|-------|--------|--------|--------|--------|
| Mix Ratio By Weight | 1A:1B | 1A:1B | 1A:1B | 1A:10B | 1A:10B | 1A:10B | 1A:10B |
| Shore Hardness | A15 | A22 | A25 | A30 | A40 | A45 | A60 |
| Pour Time (min) | 20 | 5 | 15 | 45 | 45 | 60 | 45 |
| Demold Time (hr) @ 77°F | 4-5 | 1 | 4-5 | 16 | 16 | 16 | 16 |
| Cured Color | White Translucent | Blue Translucent | Green | White | Yellow | Green | Blue |
| Mixed Viscosity (cP) | 2,500 | 3,000 | 6,000 | 15,000 | 25,000 | 35,000 | 40,000 |
| Specific Volume (in ³ /lb) | 25.0 | 25.0 | 24.3 | 25.0 | 22.0 | 21.3 | 21.3 |
| Specific Gravity | 1.10 | 1.10 | 1.14 | 1.10 | 1.26 | 1.30 | 1.30 |

decreases the pour time to ~1/3 the normal pour time. The addition of 2% decreases the normal pour time to ~1/4. The addition of 3% decreases the normal pour time to ~1/6. The demold time will also be reduced. Experiment on a small scale before making a larger mix.

RETARDING CURE SPEED: Cure time can be slowed with the addition of PlatSil® 71/73 Part R Retarder. Weigh and add 71/73 Part R to PlatSil Part A prior to mixing with Part B. Adding ~1% of 71/73 Part R to the total mixed weight of PlatSil A+B roughly doubles the pour time. Adding ~2% of 71/73 Part R triples the pour time. Do not use more than 4%, as the system may not cure at all.

THICKENING FOR BRUSH-ON: In order to make brush-on blanket molds, thicken PlatSil 73-Series rubbers by adding PlatThix liquid thickener (up to 5%, by weight) or Fumed Silica. When brushing on several layers of silicones, wait for the first layer to “gel” (i.e., not fully cured, but when the rubber has cured enough that application of a subsequent layer will not disturb the previous layer) before applying the next layer. Delamination can occur when too much time has passed in between layers; do not allow the layer to fully cure before applying the subsequent layer. Refer to the table below for estimated *maximum* elapsed time in between application of layers. Ambient and surface temperature can affect gel and cure times.

| BRUSH-ON APPLICATION: MAXIMUM ELAPSED TIME BETWEEN APPLICATION OF LAYERS | | | | | | | |
|--|-------|--------|-------|-------|-------|-------|-------|
| PlatSil® Product | 73-15 | 73-20 | 73-25 | 73-29 | 73-40 | 73-45 | 73-60 |
| Maximum Time Between Layers | 1 hr | 15 min | 1 hr | 3 hr | 3 hr | 3 hr | 3 hr |

Silicone Color Pigments can be used to vary the color of brushed layers to help ensure uniform coverage.

THINNING AND SOFTENING WITH SILICONE FLUID: Low-viscosity 50 cSt Silicone Fluid can be added to the mixed liquid rubber to thin the mix, but add sparingly since fluid addition results in some loss of strength, hardness and cure speed. If more than 10% fluid is added to the mix, then fluid may exude from the cured rubber. A 5% addition of 50 cSt Silicone Fluid to PlatSil 73-25, for example, will reduce hardness from Shore A25 to approximately Shore A20.

BARRIER COAT: A barrier coat is a fast-drying, lacquer-like primer, such as spray paint, that is sprayed into a silicone mold and allowed to dry prior to pouring liquid plastic or foam into the mold. Upon removing the cured plastic or foam casting from the mold, the barrier coat comes out on the casting resulting in a primed part. Using a barrier coat can extend mold life.

SHELF LIFE: For best results, store products in unopened containers at room temperature (60-90°F). Use products within six months. Tightly reseal containers after use.

CLEAN UP: Tools should be wiped clean before the rubber cures. Denatured ethanol is a good cleaning solvent, but it must be handled with extreme caution owing to its flammability and health hazards.

SAFETY: Before use, read product labels and Safety Data Sheets. Follow safety precautions and directions. Avoid contact with eyes and mucous membranes. Best method of cleanup is by wiping with paper towels and washing with waterless hand cleaner, then soap and water.

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

PlatSil® 71/73 Part X Accelerator - 0.25 lb, 1 lb, 8 lb, 40 lb

Retarder

PlatSil® 71/73 Part R Retarder - 0.25 lb, 1 lb, 8 lb, 40 lb

Sealers & Release Agents

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

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

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

PolyCoat Sealer & Release Agent - 1.5 lb, 8 lb

Pol-Ease® Mold Dressing - 40 lb

Pol-Ease® Mold Rinse - 40 lb

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

Thinner

Silicone Fluid 50 cSt - 2 lb, 8 lb, 40 lb

Thickeners

PlatThix Liquid Thickener 0.25 lb, 1 lb

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

Colors

Silicone Color Pigments - 4 oz, 1 lb

(Black - Blue - Fleshtone - Green - Red - White - Yellow)

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* |
| PlatSil® 73-15, PlatSil® 73-20, PlatSil® 73-25 Mix Ratio: 1A:1B | 2.0 | 1.0 | 1 pt | 1.0 | 1 pt |
| | 16.0 | 8.0 | 1 gal | 8.0 | 1 gal |
| | 80 | 40 | 5 gal | 40 | 5 gal |
| PlatSil® 73-29, PlatSil® 73-40, PlatSil® 73-45, PlatSil® 73-60 Mix Ratio: 1A:10B | 1.0 | 0.1 | 2 oz | 0.9 | 1 pt |
| | 9.0 | 0.9 | 1 pt | 8.1 | 1 gal |
| | 44 | 4.0 | 0.5 gal | 40 | 5 gal |
| | 550 | 50 | 6 gal | 500 | 55 gal |
| [†] Applies to 73-29 & 73-40 | 495 [†] | 45 [†] | 6 gal [†] | 450 [†] | 55 gal [†] |

*Volume measurements are approximate.