

PlatSil® HTS-Series Silicone Rubbers Technical Bulletin

DESCRIPTION: PlatSil® HTS-Series Silicone Rubbers are two-part, room temperature curing (RTV), platinum-catalyzed silicone rubbers. These high-performance silicones exhibit incredibly high tear strength, tensile strength, and elongation properties; molds and parts made with these silicones stand up to the rigors of high-volume production environments and repetitive demolding or stretching. They also offer good chemical resistance, making these silicones a good mold choice when planning to cast polyesters, polyurethanes (plastic, foam, rubber), epoxies and more. PlatSil rubbers have excellent release properties, making release agents unnecessary in many mold making applications. Polytek offers additives to: vary the viscosity of the liquid rubber, reduce or speed up the cure and demold times, and alter the color of the cured rubber.

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

MODEL PREPARATION: Prior to pouring or applying liquid silicone, the model or surface must be properly prepared. 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 may 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

PRODUCT LINE FEATURES

- Excellent tear strength, tensile strength and elongation
- Stands up to the rigors of repetitive demolding and/or stretching
- Cure at room temperature or accelerate with heat
- Excellent release properties
- Good chemical resistance for longer mold life
- Do not shrink on cure and offer excellent dimensional stability

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. 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

PHYSICAL PROPERTIES

Product	HTS-25	HTS-25 FAST	HTS-40
Mix Ratio By Weight	1A:10B	1A:10B	1A:10B
Shore Hardness	A25	A25	A40
Pour Time	70 min.	15 min.	30 min.
Demold Time @ 77°F	24 hr.	3 hr.	24 hr.
Cured Color	Milky White	Milky White	Milky White
Mixed Viscosity (cP)	15,500	18,000	17,000
Specific Volume (in ³ /lb)	24.9	24.9	24.9
Specific Gravity	1.11	1.11	1.11
Elongation (%)	> 2,000	1,706	831
Tensile Strength (psi)	> 645	656	686
Die B Tear Strength (pli)	179.0	176.9	131.3
Die T Tear Strength (pli)	67	73.7	56.2

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 (~73°F), PlatSil HTS-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.

COLORING: PlatSil HTS-Series silicones can be easily pigmented; Silicone Color Pigments can be added separately or in combination to the liquid silicone to achieve any desired color. Pigments are available in Fleshstone, Black, Blue, Green, Red, White and Yellow. Add up to 1.0% of the total mixed weight of the silicone mix. Add to Part B before mixing with Part A.

USING THE MOLD: No release agent is necessary for casting most materials in cured PlatSil HTS-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 HTS-Series molds can 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. Experiment on a small scale before making a larger mix. Do not add more than 3% of the total mixed weight of the silicone.

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. Experiment on a small scale before making a larger mix. Do not add more than 4% of the total mixed weight of the silicone, as the system may not cure at all.

THICKENING FOR BRUSH-ON: In order to make brush-on blanket molds, thicken PlatSil HTS-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. Ambient and surface temperature can affect gel and cure times. 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.

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, thoroughly read Safety Data Sheets and product labels. Follow safety precautions and directions.

Part A: Keep out of reach of children. 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 victim to fresh air and keep at rest in a position comfortable for breathing. Wear impervious gloves, such as butyl rubber or nitrile rubber. Wash skin thoroughly with soap and water after handling. If skin irritation occurs, get medical attention. Wear eye protection, such as chemical 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 attention.

Part B: Keep out of reach of children. 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 victim to fresh air and keep at rest in a position comfortable for breathing. Wear impervious gloves, such as butyl rubber or nitrile rubber. Wash skin thoroughly with soap and water after handling. Wear eye protection, such as chemical safety glasses/goggles. If in eyes, rinse cautiously with water for several minutes, removing contact lenses if present and easy to do.

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:
PlatSil® 71/73 Part X Accelerator

Thinner:
Silicone Fluid 50 cSt

Retarder:
PlatSil® 71/73 Part R Retarder
Sealers & Release Agents
Pol-Ease® 2300 Release Agent
Pol-Ease® 2350 Sealer & Release Agent
Pol-Ease® 2500 Release Agent
PolyCoat Sealer & Release Agent
Pol-Ease® Mold Rinse
Poly PVA Solution

Thickeners:
PlatThix Liquid Thickener
Fumed Silica

Colors:
Silicone Color Pigments
(Black - Blue - Fleshstone - Green - Red - White - Yellow)

Reinforcement Material:
Tietex® Fabric