

SILPAK R-3700-20

Translucent, Pourable Platinum Silicone System, Food Safe

Silpak R-3700-20 Liquid Silicone Rubber is a two-component, room temperature curing mold rubber. R-3700-20 silicone rubber is platinum activated, which, unlike tin-activated systems, do not shrink on cure or deteriorate over time. Molds made from R-3700-20 offer good chemical resistance, making them an appropriate choice when planning to cast polyesters, polyurethanes (plastic, foam, rubber), epoxies and more. It offers excellent release properties, making release agents unnecessary in many applications. Additives to vary the viscosity and cure time of the liquid rubber as well as hardness and color of the cured rubber are available.

Features

- Food Safe, Complies with 21CFR 177.2600
- Low viscosity
- Easy release properties
- High Tear Strength
- Cures at room temp or accelerate with heat
- Easy Mix ratios

Applications

This rubber system is used to make parts or molds used to cast the following:

- Polyester
- Epoxy
- Thermoplastics (polyvinyl)
- Urethane
- Any material where a release free casting is required
- Low melt metal (350°F)
- Wax
- Soap
- Plaster

Physical and Handling Properties

Property	Value
Color	White Translucent
Mix Ratio, by weight	1 Base : 1 Activator
Mix ratio by volume	1 Base : 1 Activator
Initial Viscosity, Base, cP	5000
Initial Viscosity, Activator, cP	6000
Initial Mixed Viscosity, at 77°F, cP	5500
Hardness, Shore A	25
Pour Time, min	15
Demold Time, (hr) @ 77°F	4-5
Specific Gravity	1.14
Specific Volume (in³/lb)	24.3
Tensile Strength, psi	480
Elongation, %	600
Tear Resistance (pli)	150
Shrinkage, in/in	0

Values listed above are typical and not intended for use in specifications.

Mold 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 **R-3700-20** rubber against a certain material, perform a small test cure on an identical surface. **R-3700-20** rubber 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 **R-3700-20** rubber 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. Carefully weigh Base and then Activator 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 R-3700-20. 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/vacuumping 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), it will cure to full harness in 4 to 5 hours. At higher temperatures, curing can be achieved faster. Curing below 60°F is not recommended.

Using the Mold

No release agent is necessary for casting most materials in molds made with R-3700-20, 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 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 mold as soon after mixing as possible. Demold when tack-free. The addition of up to 3% Part X by weight can be added to Part B to speed up demold time. Pour 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. Add up to 4% Part R to increase working time and demold 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 R-3700-20 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. For R-3700-20, the maximum time between layers is one hour. 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. A 5% addition of 50 cSt Silicone Fluid typically reduces hardness by 5 Shore A points.

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.

Food Use

Silpak R-3700-20 has been tested by an independent laboratory and found to comply with 21CFR 177.2600 (as published by the Code of Federal Regulations) for rubber articles intended for repeated use food contact surfaces in producing, manufacturing, packing, processing, preparing, treating, packaging, transporting, or holding food (subject to listed provisions in the code) **when accurately measured, thoroughly mixed, and fully cured.** Compliance with this regulation does not mean that this product is FDA approved—it is your responsibility as the user of these materials to comply with all applicable FDA requirements for approval and determine the suitability of the product for the intended use. Review this technical data bulletin for processing instructions. Prior to using accurately measured, thoroughly mixed, and fully cured silicone molds or parts for food applications, thoroughly wash the mold or part with a water and dishwashing detergent solution, rinse, and allow to dry. When applicable, thoroughly wash the mold or part in between batches.

Proper Use and Safety

Read all instructions and safety data sheets prior to use. Consult safety data sheets for all recommended safety precautions.

Storage & Shelf Life

Part A and B must be stored in their original, tightly closed containers to protect from moisture and foreign materials. Storage area should be maintained at temperatures between 60-90°F. Shelf life of materials when kept in unopened, sealed containers, at the recommended storage conditions, is six months. Containers should not be opened until ready or use. Once opened, storage life can be extended with the use of purging gas, such as nitrogen.

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