

Development Corp.

### TinSil® 70 Series

#### High-Performance, Flexible, RTV Silicone Rubbers

**DESCRIPTION:** TinSil® 70 Series RTV Silicone Rubbers are condensation-cure, tin-catalyzed, flexible mold rubbers. TinSil products consist of a liquid Part B base and Part A accelerator, which, after mixing at the proper ratio by weight, cure at room temperature to rubber with a tough, knotty tear property. TinSil molds have easy release properties and are resistant to high temperatures. TinSil molds are excellent for casting polyesters, epoxy and polyurethane resins; waxes and many other materials.

As with other Polytek® elastomers, the last two digits in the product name indicate the approximate Shore A hardness of the cured rubber. Choose the hardness of the rubber based on the application.

- **TinSil 70-10 and 70-20** are soft and, therefore, best for delicate castings. **TinSil Gel-10**, a translucent version of 70-10, is useful for animatronics and special effects.
- **TinSil 70-25, 70-26 & 70-30** are Polytek's most popular and versatile, mid-range hardness, silicone rubbers. When long strogare life of the mold is required, 70-26 is the best choice.
- **TinSil 70-39** is firm and has excellent tear properties making it popular for casting polyurethane foams and plastic prototype parts.
- **TinSil 70-60** is stable at higher temperatures making it suitable for casting low melting metals. As a result of its high hardness, TinSil 70-60 has limited tear strength.

**MODEL PREPARATION:** Porous models such as wood or plaster should be sealed to prevent penetration of the rubber into the pores of the material. Wax, petroleum jelly, lacquer, paint and most other coatings are suitable sealers. The sealed or non-porous model and other materials that will contact the rubber should be sprayed or coated with a very light coat of Pol-Ease® 2350

Release Agent. Do not use Pol-Ease 2300 Release Agent on surfaces that contact liquid TinSil, since inhibition and/or adhesion can occur. Pol-Ease 2500 Release Agent can be used on sealed models or on cured silicone rubber to prevent additional liquid silicone from adhering. TinSil rubbers bond to cured silicone rubbers unless a parting agent is used. Modeling clays containing sulfur may inhibit curing. In every case where there is any question about the compatibility between the rubber and the prepared model surface, a test cure should be made on an identical surface to determine that complete curing and good release are obtained.

Porous models should be vented from beneath to prevent trapped air from causing bubbles in the rubber.

**MIXING & CURING:** Weigh proper amounts of Part B and then Part A into a clean mixing container. *Accurate weighing is essential to obtain optimum physical properties from the cured rubber.* Mix thoroughly, scraping sides and bottom of the container. To ensure a bubble-free mold, deaerate the liquid rubber under vacuum at 28-29 inches mercury until the mass of rubber rises and then collapses. Deaerate for additional 2 minutes. For vacuuming, use a mixing container 3 to 4 times larger than the volume of rubber.

To reach full hardness in the specified demold time, temperature should be above 77°F (25°C). At lower temperatures, more time may be needed to reach full hardness. Curing below 65°F (18°C) is not recommended.

TinSil products release alcohol while curing. Before casting polyurethanes in a TinSil mold, be sure that all alcohol has evaporated since alcohol inhibits surface cure of some polyurethanes. Exposure for 24 hours to a warm location in open air is often adequate, but the mold can be baked for four hours at 212°F (100°C) to speed alcohol evaporation.

	PHYSICAL PROPERTIES						
	<b>70-10 &amp; TinSil Gel-10</b>	<b>70-20</b>	<b>70-25</b>	<b>70-26</b>	<b>70-30</b>	<b>70-39</b>	<b>70-60</b>
Mix Ratio (By Weight)	1A:10B	1A:10B	1A:10B	1A:10B	2A:100B	1A:10B	5A:100B
Hardness, Shore A	10	20	25	27	30	40	60
Pour Time (min)	45	60	60	60	60	45	30
Demold Time @ 77°F (hr)	16	16	16	16	24	16	24
Color	Blue Milky Translucent	Blue	Blue	Green	Beige	Blue	Red
Mixed Viscosity (cP)	10,000	10,000	14,000	14,000	26,000	25,000	17,000
Specific Volume (in³/lb)	25.3	25.3	25.3	25.3	25.3	21.7	18
Specific Gravity	1.1	1.1	1.1	1.1	1.1	1.27	1.5
Shrinkage Upon Cure (%)	~0.3	~0.3	~0.3	~0.3	~0.3	~0.3	~0.8

Product	PACKAGING				
	Unit Weight (lb)	Size		Net Weight (lb)	
		A	B	A	B
<b>TinSil® 70-10, 70-20, 70-25, 70-26, 70-39</b> <b>TinSil Gel-10</b> Mix Ratio 1A:10B	1.0	4 oz	1 pt	0.1	0.9
	9.0	1 pt	1 gal	0.9	8.1
	44.0	1/2 gal	5 gal	4.0	40.0
	495	5 gal	55 gal	45.0	450
<b>TinSil® 70-30</b> Mix Ratio 2A:100B	1.02	1 oz	1 pt	0.02	1.0
	8.3	4 oz	1 gal	0.20	8.1
	40.8	1 pt	5 gal	0.80	40.0
	448.8	1 gal + 1 pt	55 gal	8.8	440
<b>TinSil® 70-60</b> Mix Ratio 5A:100B	1.05	1 oz	1 pt	0.05	1.0
	8.4	1/2 pt	1 gal	0.4	8.0
	42.0	1 qt	5 gal	2.0	40.0
	462	5 gal	55 gal	22.0	440

**USING THE MOLD:** No release agent is necessary for casting most materials in TinSil molds. For longer mold life, however, apply a barrier coat or Pol-Ease 2300 Release Agent to molds before casting epoxy, polyurethane or polyester resins. TinSil molds can be stored for a year or more, but as with most tin-catalyzed silicones, molds may eventually deteriorate and lose their elasticity. Molds made with excess catalyst may degrade from aging faster than silicone rubbers cured with less catalyst.

**FASTER CURES FOR RAPID DEMOLDING:** Use TinSil FastCat in place of any TinSil Part A to accelerate cure and shorten demold time. When using FastCat, the working time is shorter as well, so avoid over-catalyzing. FastCat can be used in a range of 2 to 6 parts per 100 parts B. At 2 parts FastCat to 100 parts B, the working time and demold time will be similar to that observed when using 10 parts of the appropriate TinSil Part A. At 3 parts FastCat per 100 parts TinSil B, the working time will be reduced to ~20-30 minutes, with <8-hour demold. Experiment with a small mix first to determine the best amount of FastCat to use. Use of FastCat can shorten the library life of cured TinSil rubber.

**BRUSH ON BLANKET MOLDS:** TinSil 70 Series rubbers can be thickened with TinThix liquid thickener or with Cab-O-Sil® for brushing on a blanket mold. TinThix is a liquid additive that can be mixed into the Part B (before mixing with Part A) to achieve varying levels of thixotropy.

Blanket molds can be reinforced by placing stretchy, open mesh nylon or dacron cloth into the uncured rubber. The fabric should not be too close to the mold surface or the weave of the cloth may show through to the face of the mold.

**THINNING AND SOFTENING WITH SILICONE FLUID:** The very low viscosity 50 cSt Silicone Fluid can be added sparingly to the mixed rubber to thin the mix with some loss of strength, hardness and cure speed. More than 10% fluid addition may exude from the cured rubber. A 10% addition to TinSil 70-20 will reduce hardness to approximately Shore A10-15.

**BARRIER COAT:** Barrier PF is a fast drying, lacquer-like primer that can be sprayed into a silicone mold and allowed to dry prior to pouring plastic. The plastic cures against the barrier coat and comes out on the plastic casting resulting in a pre-primed part. Using a barrier coat may extend mold life.

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

**WARNING!** Contact with uncured products may cause severe eye and skin irritation. Avoid contact with skin and eyes. Use only with adequate ventilation. Best method of cleanup is by wiping with paper towels and washing with waterless hand cleaner, then soap and water. If solvents must be used, denatured ethyl alcohol is best, but should be handled with respect for health and flammability hazards. TinSil products are not to be used where food or body contact may occur.

**STORAGE LIFE:** At least 6 months in unopened containers stored at room temperature (60-90°F). Tightly reseal opened containers.

**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
<b>Barrier PF</b> 1 qt (1.5 lb), 5 gal (35 lb)
<b>Cab-O-Sil®</b> 5 gal, 1 bag (10 lb)
<b>Pol-Ease® 2300 Release Agent</b> 12 oz can, case of 12 cans
<b>Pol-Ease® 2350 Release Agent</b> 1 qt (1.5 lb), 5 gal (26 lb)
<b>Pol-Ease® 2500 Release Agent</b> 12 oz can, case of 12 cans
<b>TinSil® FastCat</b> 4 oz, 1 pt (1 lb), 1 gal (8 lb)
<b>TinThix</b> 4 oz, 1 pt (1 lb)
<b>Silicone Fluid 50 cSt Grade</b> 1 qt (2 lb), 1 gal (8 lb), 5 gal (40 lb)