



# PRODUCT BULLETIN 8

## TAP Silicone RTV System

The most versatile moldmaking system available

## How to use TAP Silicone RTV System

### Why use TAP SILICONE RTV SYSTEM?

- Suitable for making: poured block molds, multi-part molds and brush-on molds
- 28 Shore A – flexible – good dimensional stability
- Good elongation and tear strength
- Low linear shrinkage
- Excellent long term retention of rubber properties
- Color contrast to visually ensure thorough mixing
- Thinner Additive for detailed skin coats
- Thixotropic Additive for brush on molds
- Cast parts that can be painted immediately
- Fast catalyst for mold cure of 4-6 hours

**TAP Silicone RTV System** is a complete mold making system that can be used to make virtually any type of mold. TAP Silicone RTV is a two component, tin catalyzed, room temperature cured silicone rubber. It is designed as a 28 Shore A mold rubber – meaning it is flexible, has good dimensional stability, and good elongation and tear strength. It has very low shrinkage, excellent long-term retention of rubber properties and accurate detail reproduction. It is excellent for casting cement, vinyl, wax, plaster, low-melt metals, urethane resins, epoxy resins and polyester resins. It is a safe product to use when directions are followed fully.

### System Components

**Side A (Base Component)** is an off-white liquid with medium viscosity of 29,000 cps. Since this is a tin or condensation cure system, inhibition is not common. The clay TAP carries will not affect the cure. Testing should always be done if there is any uncertainty.

**Side B (Blue Catalyst)** has a 4-6 hour de-mold time, allowing two-part molds to be completed in one day with no loss in mold properties. Mixing ratio is 10 parts side A to 1 part side B by weight, or 9-to-1 by volume. Catalyst should be shaken prior to measuring.

**Silicone Thinner** is a clear silicone fluid that can be added to reduce the viscosity of Silicone RTV. Ideal for creating a bubble free skin coat prior to adding a thick coat. Use no more than 10 parts of thinner to 100 parts of silicone by weight. The thinner will increase working time and decrease final hardness and tear strength.

**Thixotropic Additive** increases the viscosity of silicone from a slow flowing liquid up to a 'peanut butter' consistency paste. Recommended mix ratio is .5%-5% by weight, depending on the viscosity desired. Adding more than 5% will degrade the mold quality. The additive allows the silicone to be brushed on vertical surfaces and to be used for glove molds. The Thixotropic Additive does not change cure time.

### Physical Properties

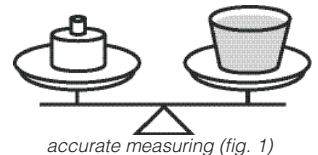
Mixed Ratio 10 parts Side A to 1 part Side B by weight or 9-to-1 by volume.

<b>Specific Gravity</b>	1.16
<b>Color (mixed)</b>	Blue
<b>Hardness,</b>	Shore A 25-30
<b>Working Time</b>	30 to 40 minutes
<b>De-mold</b>	4 to 6 hours
<b>Viscosity (mixed)</b>	24,000 cps
<b>Tensile Strength</b>	600 psi
<b>Tear Resistance</b>	125 ppi
<b>Linear Shrinkage</b>	4 days <.4%
<b>Coverage</b>	approx 23 cu. in./lb. or 12.5 fl. oz/lb.
<b>Temperature Range</b>	-50° to 150°C (-58 to 302)°F



### Mixing

Accurate measuring (fig. 1) is essential. Inaccurate measuring causes changes in the physical properties of the cured material. While a 10% ratio by weight of catalyst is ideal, the silicone will tolerate an 8-13% range.



accurate measuring (fig. 1)

Thorough mixing is also essential. Mix components by hand or with mixer (electric drill fitted with paint paddle attachment or similar) until color is uniform (no white or streaks). The most common cause of incomplete cure and mold failure is improper mixing. If you are using a TAP measuring container, look through the side and bottom of the cup to make sure mixing has removed all white streaks from the container.

### Releases

One of the great advantages of Silicone RTV is that it seldom needs a mold release. This not only eliminates steps in the mold making process, it also means parts are paintable directly from the mold without further preparation. However, there are exceptions and testing on an inconspicuous area is always recommended.

Silica based materials (such as some types of glass) and anything containing silicone are prone to bonding and will likely require a release.

When making a two-part mold, it is essential to use a release (which contains no silicone) between the two parts because silicone will bond to silicone. PVA, petroleum jelly, or wax mold release can be used. The key is to completely coat the surface before pouring the second layer of silicone.

### Bubble Removal

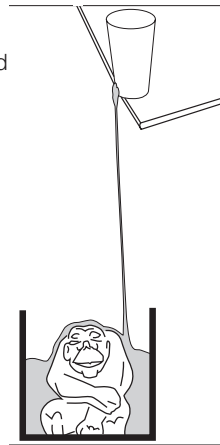
Since silicone RTV is a viscous liquid, thorough mixing introduces numerous bubbles, which do not quickly float to the surface. If bubbles are present where the silicone contacts the master, the surface reproduction will be deformed. There are two methods for bubble removal (de-airing)

First is the use of a vacuum chamber.

- Mix the base and catalyst in a container 4 to 5 times the volume of the material itself. The chamber recommended by TAP will hold a one-gallon container.
- Place the container in the chamber and pull a vacuum of 28 inches Hg. The material will foam up and then collapse.
- If the silicone looks like it will overflow, let a little air in the chamber to reduce the vacuum, and the rubber will drop. Then, continue the vacuum.
- After the silicone drops, it will continue to appear to "boil". Run the pump for 6 or 7 more minutes. Release the vacuum and pour rubber over part.

If a vacuum chamber is not available, there is an economical alter-

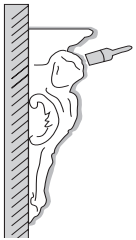
native (see fig. 2). Cut a 1/2" hole in the side of a paper cup, near the bottom of the cup. Place tape over the hole. Mix the silicone as usual and transfer to the paper cup. Suspend the cup at least 30" above the mold container. (Placing the cup on the edge of a table and the mold on the floor works well.) Remove the tape, and allow the silicone to flow into the corner of the mold and slowly fill the mold container. The silicone will flow in a very thin stream that will cause any entrapped bubbles to break before they reach the mold. If the mold has significant undercuts or detail, it might be advantageous to first brush a thin coat of silicone on the mold to ensure no bubbles are trapped against the surface. Any small bubbles that appear can be broken with an air gun at low pressure (15-30 psi).



Economical alternative (fig. 2)

## Mold Types

In simplest terms, almost all molds can be categorized either as pour-on (see fig. 3) or brush-on (see fig. 4). TAP RTV Silicone System can be used effectively for either type. See Product Bulletins 7a & 7c for details on constructing various mold types.



brush-on mold (fig. 4)

### Using the Additives

The Thinner and Thixotropic Additives give the TAP Silicone RTV System complete versatility.

Use the Thinner to improve flow characteristics, improve bubble release, and for making an initial 'skin coat'.

Thinned silicone will flow more easily into the intricate details of the master. Once the skin coat has gelled, a thicker coat can be added. Never use more than 10% of the thinner or the mold will be degraded. Use of the Thinner increases the working and cure time slightly.

Since the Thinner is a silicone fluid, it can also be used to rejuvenate a mold. Every casting removes some of the silicone release ability from the mold and eventually parts begin to stick. When sticking is first noticed, wipe the inside of the mold with a coat of the Thinner, then wipe off any excess. The Thinner will soak into the needed areas and restore the release properties. Never let the Thinner puddle and soak the mold.

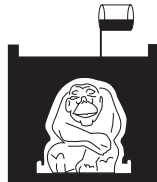
Use the Thixotropic Additive to create a spreadable paste that can even be applied to vertical surfaces. Once the 'skin coat' (mentioned above) has gelled, the thickened silicone can be spread on to the desired thickness making a glove or blanket mold in two easy steps. Use of the thickener allows molds to be made on location (i.e., the side of a building) when the master cannot be moved. The user can add .5%-5% Thickener to create the desired consistency. Greater than 5% is not recommended.

## Casting Mediums

**TAP Silicone RTV System** is compatible with any of the casting materials stocked in our stores. It is also excellent for cement, plaster, wax, vinyls and low-melt metals.

One of the great advantages of silicone over other mold types is the fact that a release agent is seldom required. However, release agents can extend mold life. This is especially important with polyester and epoxy castings, since they are harder on a mold than other casting mediums. **TAP's Pol-Ease 2300** is a good release agent that is extremely easy to use. However, if a part is to be painted, the Pol-Ease must be removed with a strong detergent prior to painting. PVA can also be used as a release. It is easily removed with plain water, leaving the cast part ready to paint. Fillers can be used with polyester, epoxy, and Quik-Cast, and they will improve the life of the mold since they reduce the amount of resin. Use fillers to produce incredible effects and dramatically reduce cost. Experiment with the possibilities!

With all casting materials, the cast part should be removed from the mold as soon as possible to prevent mold degradation from heat and chemical migration.



pour-on mold (fig. 3)

## Tips

- When a silicone mold tears, it can be repaired with any common household silicone adhesive sealant.
- Certain casting materials can degrade the mold. Chemical attack can be lessened by occasionally "baking out", the empty mold at 160-200°F for 2 hours.
- Casting unfilled polyester in flexible molds often produces tacky uncured surface. **Casting Craft Spray** can be applied to the finished piece to complete the surface cure.
- Clean-up of uncured silicone can be accomplished with mineral spirits, acetone, or MEK.
- **Pol-Ease 2300** is a fine release for casting. It should not be used when pouring the second part of a two part mold, because it contains silicone.
- Warm humid weather promotes a faster cure. Cold, dry weather inhibits cure. In cold dry weather a damp cloth draped over the curing mold hastens cure.
- Warm silicone to approximately 80°F—mixing is easier and curing accelerates.
- A glue gun is an excellent tool for attaching a model to its base and, also, for attaching and sealing a mold wall to the base.
- Even though a mold may be used in as little as 6 hours. The silicone continues to cure for 7 days. Molds produce better polyester castings after the 7 day cure.
- Store molds in a dark, dry area. Thin walled molds should be stored with model inside (or in their backup mold) to eliminate possible distortion.
- Vacuum chamber can be purchased at: **Wesco Enterprises, 3235 Monier Circle, Suite 1, Rancho Cordova, CA 95742. Phone: 916-635-1270. Fax: 916-635-2474.** Cost: Approx. \$999
- More info and how-to video on mold making is available at **tapplastics.com**

## WARNING

TAP Silicone RTV System contains only constituents that over many years have proved to be neither toxic nor aggressive. Catalyst may cause irritation upon eye contact. Follow all instructions for safe use. **KEEP OUT OF REACH OF CHILDREN.**

Keep Side A and Side B containers tightly closed when not in use to prevent reaction with moisture in air. TAP Silicone RTV System (Side A) shelf life is 6 months in original unopened containers when stored at 75° F. TAP Silicone RTV Catalyst (Side B - Blue) shelf life is 6 months in original unopened containers when stored at 75° F.

SDS available at **tapplastics.com**

## WARRANTY

TAP Products are manufactured to quality specifications, however they should be tested to determine their suitability for your application. Since we have no control over working conditions or methods, our liability does not exceed the value or replacement of this product. TAP Resin products are guaranteed for six months from date of purchase or nine months from code date on container.

View all of TAP's how-to videos on plastic, fiberglass, mold-making, window films, and more at:

[http://www.tapplastics.com/product\\_info/videos](http://www.tapplastics.com/product_info/videos)



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