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, epoxide 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 for either one 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. Thixotropic Additive does not change cure time.

**PHYSICAL PROPERTIES**

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>SIDE A</th>
<th>SIDE B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific Gravity</td>
<td>1.16</td>
<td>Blue</td>
</tr>
<tr>
<td>Color</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hardness, Shore A</td>
<td>25-30</td>
<td></td>
</tr>
<tr>
<td>Working Time</td>
<td>30 to 40 minutes</td>
<td></td>
</tr>
<tr>
<td>De-mold Time</td>
<td>4 to 6 hours</td>
<td></td>
</tr>
<tr>
<td>Viscosity (mixed)</td>
<td>24,000 cps</td>
<td></td>
</tr>
<tr>
<td>Tensile Strength</td>
<td>600 psi</td>
<td></td>
</tr>
<tr>
<td>Tear Resistance</td>
<td>125 psi</td>
<td></td>
</tr>
<tr>
<td>Linear Shrinkage</td>
<td>4 days &lt; 4%</td>
<td></td>
</tr>
<tr>
<td>Temperature Range</td>
<td>-50º to 180ºC (-58 to 302)ºF</td>
<td></td>
</tr>
<tr>
<td>Coverage</td>
<td>approx 23 cu. in./lb. or 12.5 fl. oz/lb.</td>
<td></td>
</tr>
</tbody>
</table>

**MIXING**

Accurate measuring 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.

Thorough mixing is also essential. Mix components by hand or with a mixer (electric drill fitted with Squirrel® type mixer or similar) until color is uniform (no white 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 Marvin.
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 is damaged. There are two methods for bubble removal (de-airing).

First is the use of a vacuum chamber. (To purchase a vacuum chamber, see back of the product bulletin.)

- 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 alternative (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. Place 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).

**MOLD TYPES**

In simplest terms, almost all mold types 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.

**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, 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 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 casting “clean”. Fillers are laminated or even completely removed. 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: $695
- More info and how-to video on mold making is available at www.tapplastics.com

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.

**TIPS**

- When a silicone mold tears, it can be repaired with any common household silicone adhesive sealant.
- Certain casting mediums 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.
- When a silicone mold tears, it can be repaired with any common household silicone adhesive sealant.
- To repair a silicone mold, see Fig. 5. Silicone mold is cut along the center line and the two parts are separated. The mold is then placed in a vacuum chamber and pulled 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 onto the part.

In simplest terms, almost all molds can be introduced with a flexible mold. In simplest terms, almost all molds can be introduced with a flexible mold.