Technical Data Sheet

# SILASTIC™ RTV-3110 Mold-Making Base
# SILASTIC™ RTV-3112 Mold-Making Base
# SILASTIC™ RTV-3120 Mold-Making Base

General purpose silicone moldmaking rubbers.

## Features & Benefits

- Two-part RTV silicone rubbers
- Low mixed viscosity
- Adjustable cure times
- Easy to use
- Reproduce intricate details
- Works in a wide range of service temperatures

## Composition

- Condensation cure silicone RTV rubbers

## Applications

- Recommended for simple patterns with no undercuts
- SILASTIC™ RTV-3110 Mold-Making Base can be used where vacuum de-airing isn't always required
- Can be used in electronic potting and encapsulating applications

## Typical Properties

Specification Writers: These values are not intended for use in preparing specifications.

| Test | Property | Unit | SILASTIC™ RTV-3110 Mold-Making Base[1] | SILASTIC™ RTV-3112 Mold-Making Base[1] | SILASTIC™ RTV-3120 Mold-Making Base[1] |
|---|---|---|---|---|---|
| | **As supplied** | | | | |
| | Color | | White | White | Red |
| | Viscosity at 25°C (77°F) | poise | 130 | 280 | 280 |
| | Specific gravity at 25°C (77°F) | | 1.14 | 1.30 | 1.45 |
| | **Physical and mechanical properties, as cured** | | | | |
| | Useful temperature range | °C (°F) | -55 to 200 (-67 to 392) | -55 to 250 (-67 to 482) | -55 to 300 (-67 to 572) |
| | Tensile strength, die C | psi | 395 | 640 | 582 |
| | Elongation | percent | 170 | 127 | 128 |
| | Durometer hardness, Shore A | points | 45 | 58 | 56 |

1. Results were obtained using SILASTIC™ RTV-3010-S Catalyst at 10:1 base to catalyst ratio. Wide departures from normal 10:1 ratio may slightly alter physical properties such as hardness and elongation. Based on sample thickness of 125 mils, cured 24 hours at room temperature.

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## Typical Properties (Cont.)

| Test | Property | Unit | SILASTIC™ RTV-3110 Mold-Making Base | SILASTIC™ RTV-3112 Mold-Making Base | SILASTIC™ RTV-3120 Mold-Making Base |
|---|---|---|---|---|---|
| | **Electrical properties, as cured** | | | | |
| ASTM[2] D 150 | Dielectric constant at 25°C (77°F)<br>100 Hz<br>100 kHz | | <br>3.26<br>3.16 | <br>3.56<br>3.32 | <br>3.72<br>3.7 |
| ASTM D 150 | Dissipation factor at 25°C (77°F)<br>100 Hz<br>100 kHz | | <br>0.0056<br>0.0022 | <br>0.0135<br>0.0038 | <br>0.0103<br>0.003 |
| ASTM D 149 | Dielectric strength | volts/mil | 456 | 470 | 418 |
| ASTM D 257 | Volume resistivity | ohm-cm | 5.68 E+14 | 2.72 E+14 | 3.46 E+14 |

| Catalyst | Color | Consistency | Demold Time[3] | Cure Conditions |
|---|---|---|---|---|
| DOWSIL™ 4 Catalyst<br>(Fast rate, 200;1 ratio, no corrosion inhibitor) | Clear straw | Liquid | 10 minutes–2 ½ hours | Room temperature -<br>any thickness or in confined places |
| SILASTIC™ RTV-3000 F Catalyst<br>(Fast rate, 20:1 ratio, corrosion inhibitor) | Light tan | Paste | 25 minutes–2 hours | Room temperature -<br>any thickness or in confined spaces |
| SILASTIC™ RTV-3010-S Catalyst<br>(10:1 ratio, corrosion inhibitor) | Light blue | Paste | 7–12 hours | Room temperature -<br>any thickness or in confined spaces |

2. ASTM: American Society for Testing and Materials
3. Demold time varies based on the Dow RTV base used with the catalyst

## Description

SILASTIC™ RTV-3100 Series are pourable rubber bases that become firm, flexible silicone rubber when cured. There is a choice of three catalysts to select from in order to tailor your working times and cure rates. SILASTIC™ RTV-3100 Series:

- Is easily mixed and poured
- Cures at room temperature in any thickness
- Gives accurate reproduction of masters for moldmaking
- Provides a wide service temperature range

### Catalysts

A common catalyst concentration is 10:1 base to catalyst by weight, which assures more accurate measuring and mixing of catalyst. Varying the catalyst concentration will change the curing rate as indicated on Table 1. Decreasing the catalyst level will slow the cure and give longer working and demold times. Keep all catalyst containers tightly closed when not in use.

Note: A 10:1 mixing ratio is not recommended for DOWSIL™ 4 Catalyst or SILASTIC™ RTV-3000 F Catalyst. Do not use SILASTIC™ RTV-3010-S Catalyst or SILASTIC™ RTV-3000 F Catalyst when molding polyesters because the polyester can be inhibited. DOWSIL™ 4 Catalyst is recommended for polyester molds.

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**Table 1:** Base/Catalyst Ratios, Working Times and Demold Times

| | Base/Catalyst Mixing Ratio by Weight | Approximate Working Time | Approximate Demold Time |
|---|---|---|---|
| **SILASTIC™ RTV-3110 Base** | | | |
| **SILASTIC™ RTV-3010-S Catalyst** | 5:1 | 1 hour | 5 hours |
| | 10:1 | 2 hours | 7 hours |
| | 20:1 | 3 hours | 12 hours |
| **SILASTIC™ RTV-3000 F Catalyst** | 10:1 | 10 minutes | 27 minutes |
| | 20:1 | 40 minutes | 80 minutes |
| **DOWSIL™ 4 Catalyst** | 100:1 | 3 minutes | 10 minutes |
| | 200:1 | 5 minutes | 20 minutes |
| | 400:1 | 20 minutes | 2 hours |
| **SILASTIC™ RTV-3112 Base** | | | |
| **SILASTIC™ RTV-3010-S Catalyst** | 5:1 | 30 minutes | 6 hours |
| | 10:1 | 1 hour | 8 hours |
| | 20:1 | 2 hours | 12 hours |
| **SILASTIC™ RTV-3000 F Catalyst** | 10:1 | 12 minutes | 37 minutes |
| | 20:1 | 28 minutes | 100 minutes |
| **DOWSIL™ 4 Catalyst** | 100:1 | 2 minutes | 10 minutes |
| | 200:1 | 5 minutes | 20 minutes |
| | 400:1 | 15 minutes | 1½ hours |
| **SILASTIC™ RTV-3120 Base** | | | |
| **SILASTIC™ RTV-3010-S Catalyst** | 5:1 | 30 minutes | 6 hours |
| | 10:1 | 1 hour | 8 hours |
| | 20:1 | 2 hours | 12 hours |
| **SILASTIC™ RTV-3000 F Catalyst** | 10:1 | 8 minutes | 25 minutes |
| | 20:1 | 25 minutes | 1½ hours |
| **DOWSIL™ 4 Catalyst** | 100:1 | 2 minutes | 10 minutes |
| | 200:1 | 5 minutes | 30 minutes |
| | 400:1 | 15 minutes | 2½ hours |

## How to Use

### Substrate Penetration

The surface of the original should be clean and free of loose material. If necessary, and in particular with porous substrates, use a suitable release agent such as petroleum jelly or soap solution.

### Mixing

Thoroughly stir SILASTIC™ RTV-3100 Series bases before using, as filler separation may occur upon prolonged standing. Weigh the base and appropriate catalyst into a clean container, mix together until the catalyst is completely dispersed in the base. Hand or mechanical mixing can be used, but do not mix for an extended period of time or allow the temperature to exceed 35°C (95°F).

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## How to Use (Cont.)

**Mixing (Cont.)**
With the exception of SILASTIC™ RTV-3110 Base, it is strongly recommended that entrapped air be removed in a vacuum chamber, allowing the mix to completely expand and then collapse. A vacuum of at least 28 inches of mercury should be held until most bubbling has ceased. After an additional 1–2 minutes under vacuum, the mix should be inspected and if free of air bubbles, can then be used. A volume increase of 3–5 times will occur on vacuum de-airing the mixtures, so a suitably large container should be chosen.

Caution: Prolonged vacuum will remove volatile components from the mix and may result in poor thick section and non-typical properties.

Air entrapment can be minimized by mixing a small quantity of base and catalyst, then using a brush, painting the original with a thin layer. Leave at room temperature until the surface is bubble free and the layer has begun to cure. Mix a further quantity of base and catalyst and proceed as follows to produce a final mold.

**Pouring the Mixture and Curing**
Pour the mixed base and catalyst as soon as possible onto the original, avoiding air entrapment. The catalyzed material will cure to a flexible rubber and the mold can then be removed (see table of Typical Properties for details). If the working temperature is significantly lower than 23°C (73.4°F), the cure time will be longer. If the room temperature or humidity is very high, the working time of the catalyzed mixture will be reduced. The final mechanical properties will be reached within 7 days.

**Deep-section Cure**
SILASTIC™ RTV-3100 Series may depolymerize when overheated in total confinement. To minimize this effect, electrical pottings which must operate in total confinement at elevated temperatures must be given a graduated post cure which allows volatiles to escape. During the graduated post cure, the temperature should be increased approximately 25°C (77°F) per hour depending upon thickness of the potted section. A final bake of two to four hours at a temperature 50°C (122°F) degrees above the maximum operating temperature of the device is recommended.

**Use at High Temperatures**
Some molds produced from condensation cure silicone rubbers can degrade when exposed to temperatures above 150°C (302°F) over a period of time or when totally confined in storage at high ambient temperatures. This can result in softening and loss of elastic properties.

**Electronic Applications**
SILASTIC™ RTV-3100 Series can be used in electronic applications using the SILASTIC™ RTV-3010-S Catalyst or SILASTIC™ RTV-3000 F Catalyst. The cured rubbers exhibit good dielectric properties.

In potting with SILASTIC™ RTV-3100 Series, the part or assembly to be packaged is placed in a form with clearance at all points when sealing is necessary. This form may be made of paper, aluminum foil, metal or plastic.

A release agent may be used to aid in demolding.

When printed circuit boards and similar assemblies are to be dip coated, select the viscosity grade that will give the desired coating thickness.

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## How to Use (Cont.)

**Electronic Applications (Cont.)**

To apply SILASTIC™ RTV-3100 Series as a conformal coating, immerse parts in the catalyzed compound, withdraw them slowly, pausing just before the part leaves the dip tank to minimize stringing and hang on a rack to cure. Allow one to two hours between dips. Two dips in a low viscosity grade encapsulant are suggested for optimum protection.

For maximum assurance of void-free potting, pour the silicone RTV rubber, then apply a vacuum to facilitate the removal of air.

## Handling Precautions

PRODUCT SAFETY INFORMATION REQUIRED FOR SAFE USE IS NOT INCLUDED IN THIS DOCUMENT. BEFORE HANDLING, READ PRODUCT AND SAFETY DATA SHEETS AND CONTAINER LABELS FOR SAFE USE, PHYSICAL AND HEALTH HAZARD INFORMATION. THE SAFETY DATA SHEET IS AVAILABLE ON THE DOW WEBSITE AT DOW.COM, OR FROM YOUR DOW SALES APPLICATION ENGINEER, OR DISTRIBUTOR, OR BY CALLING DOW CUSTOMER SERVICE.

## Usable Life and Storage

Product should be stored at or below 32°C (89.6°F) in original, unopened containers.

## Limitations

This product is neither tested nor represented as suitable for medical or pharmaceutical uses.

Not intended for human injection. Not intended for food use.

## Health and Environmental Information

To support customers in their product safety needs, Dow has an extensive Product Stewardship organization and a team of product safety and regulatory compliance specialists available in each area.

For further information, please see our website, dow.com or consult your local Dow representative.

## Disposal Considerations

Dispose in accordance with all local, state (provincial) and federal regulations. Empty containers may contain hazardous residues. This material and its container must be disposed in a safe and legal manner.

It is the user's responsibility to verify that treatment and disposal procedures comply with local, state (provincial) and federal regulations. Contact your Dow Technical Representative for more information.

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