Product Information
Elastomeric Replication

Dow Corning® 3110, 3112, and 3120 RTV Rubbers

FEATURES
- Two-part RTV silicone rubber
- Low mixed viscosity
- Adjustable cure times

APPLICATIONS
- Recommended for simple patterns with no undercuts.
- Dow Corning® 3110 can be used where vacuum de-airing isn’t always required.
- Can be used in electronic potting and encapsulating applications.

BENEFITS
- Easy to use
- Reproduce intricate details
- Works in a wide range of service temperatures

COMPOSITION
- Condensation cure silicone RTV rubber

DESCRIPTION
Dow Corning® 3110, 3112, and 3120 RTV Rubbers 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. These RTV Rubbers:
- Are easily mixed and poured
- Cure at room temperature in any thickness
- Give accurate reproduction of masters for moldmaking
- Provide 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 I. 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.

HOW TO USE

Substrate Preparation
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 Dow Corning 3110, 3112 or 3120 Base 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).

Catalyst concentration can be increased as indicated in Table I. With the exception of Dow Corning 3110 RTV Rubber, 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.
## TYPICAL PROPERTIES

<table>
<thead>
<tr>
<th></th>
<th>Dow Corning® 3110 RTV Rubber¹</th>
<th>Dow Corning® 3112 RTV Rubber¹</th>
<th>Dow Corning® 3120 RTV Rubber¹</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>As supplied</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td>White</td>
<td>White</td>
<td>Red</td>
</tr>
<tr>
<td>Viscosity at 25°C (77°F), poise</td>
<td>130</td>
<td>280</td>
<td>280</td>
</tr>
<tr>
<td>Specific Gravity at 25°C (77°F)</td>
<td>1.14</td>
<td>1.30</td>
<td>1.45</td>
</tr>
</tbody>
</table>

### 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

### Electrical Properties, as cured

- **Dielectric Constant at 25°C (77°F) (ASTM D 150)**
  - 100 Hz: 3.26
  - 100 kHz: 3.16

- **Dissipation Factor at 25°C (77°F) (ASTM D 150)**
  - 100 Hz: .0056
  - 100 kHz: .0022

- **Dielectric Strength, Volts/mil (ASTM D 149)**
  - 456

- **Volume Resistivity, ohm-cm (ASTM D 257)**
  - 5.68E+14

¹Results were obtained using Dow Corning® S Tin NW 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 mm, cured 24 hours at room temperature.

### Specification Writers

*These values are not intended for use in preparing specifications. Please contact your local Dow Corning sales office or your Global Dow Corning Connection before writing specifications on this product.*

<table>
<thead>
<tr>
<th>Catalyst</th>
<th>Color Consistency</th>
<th>Demold Time¹</th>
<th>Cure Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (Fast rate, 200:1 ratio, no corrosion inhibitor)</td>
<td>Clear straw Liquid</td>
<td>10 minutes – 2 ½ hours Room temperature - any thickness or in confined places</td>
<td></td>
</tr>
<tr>
<td>F (Fast rate, 20:1 ratio, corrosion inhibitor)</td>
<td>Light tan Paste</td>
<td>25 minutes – 2 hours Room temperature – any thickness or in confined spaces</td>
<td></td>
</tr>
<tr>
<td>S Tin NW Catalyst (10:1 ratio, corrosion inhibitor)</td>
<td>Light blue Paste</td>
<td>7-12 hours Room temperature – any thickness or in confined spaces</td>
<td></td>
</tr>
</tbody>
</table>

¹Demold time varies based on the Dow Corning RTV base used with the catalyst.

### 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

*Dow Corning 3110, 3112, and 3120 RTV Rubbers 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
Table I: Base/Catalyst Ratios, Working Times and Demold Times

<table>
<thead>
<tr>
<th></th>
<th>Base/Catalyst Mixing Ratio by Weight</th>
<th>Approximate Working Time</th>
<th>Approximate Demold Time</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dow Corning® 3110 RTV Rubber</strong></td>
<td>5:1</td>
<td>1 hour</td>
<td>5 hours</td>
</tr>
<tr>
<td></td>
<td>10:1</td>
<td>2 hours</td>
<td>7 hours</td>
</tr>
<tr>
<td></td>
<td>20:1</td>
<td>3 hours</td>
<td>12 hours</td>
</tr>
<tr>
<td><strong>Dow Corning® S Tin NW Catalyst</strong></td>
<td>5:1</td>
<td>10 minutes</td>
<td>27 minutes</td>
</tr>
<tr>
<td></td>
<td>10:1</td>
<td>40 minutes</td>
<td>80 minutes</td>
</tr>
<tr>
<td><strong>Dow Corning® F Catalyst</strong></td>
<td>10:1</td>
<td>3 minutes</td>
<td>10 minutes</td>
</tr>
<tr>
<td></td>
<td>20:1</td>
<td>5 minutes</td>
<td>20 minutes</td>
</tr>
<tr>
<td><strong>Dow Corning® 4 Catalyst</strong></td>
<td>100:1</td>
<td>20 minutes</td>
<td>2 hours</td>
</tr>
<tr>
<td><strong>Dow Corning® 3112 RTV Rubber</strong></td>
<td>5:1</td>
<td>30 minutes</td>
<td>6 hours</td>
</tr>
<tr>
<td></td>
<td>10:1</td>
<td>1 hour</td>
<td>8 hours</td>
</tr>
<tr>
<td></td>
<td>20:1</td>
<td>2 hours</td>
<td>12 hours</td>
</tr>
<tr>
<td><strong>Dow Corning® S Tin NW Catalyst</strong></td>
<td>5:1</td>
<td>12 minutes</td>
<td>37 minutes</td>
</tr>
<tr>
<td></td>
<td>10:1</td>
<td>28 minutes</td>
<td>100 minutes</td>
</tr>
<tr>
<td><strong>Dow Corning® F Catalyst</strong></td>
<td>100:1</td>
<td>2 minutes</td>
<td>10 minutes</td>
</tr>
<tr>
<td></td>
<td>200:1</td>
<td>5 minutes</td>
<td>20 minutes</td>
</tr>
<tr>
<td></td>
<td>400:1</td>
<td>15 minutes</td>
<td>1½ hours</td>
</tr>
<tr>
<td><strong>Dow Corning® 3120 RTV Rubber</strong></td>
<td>5:1</td>
<td>30 minutes</td>
<td>6 hours</td>
</tr>
<tr>
<td></td>
<td>10:1</td>
<td>1 hour</td>
<td>8 hours</td>
</tr>
<tr>
<td></td>
<td>20:1</td>
<td>2 hours</td>
<td>12 hours</td>
</tr>
<tr>
<td><strong>Dow Corning® S Tin NW Catalyst</strong></td>
<td>100:1</td>
<td>8 minutes</td>
<td>25 minutes</td>
</tr>
<tr>
<td></td>
<td>200:1</td>
<td>25 minutes</td>
<td>1½ hours</td>
</tr>
<tr>
<td><strong>Dow Corning® F Catalyst</strong></td>
<td>1000:1</td>
<td>2 minutes</td>
<td>10 minutes</td>
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<tr>
<td></td>
<td>2000:1</td>
<td>5 minutes</td>
<td>30 minutes</td>
</tr>
<tr>
<td></td>
<td>4000:1</td>
<td>15 minutes</td>
<td>2½ hours</td>
</tr>
</tbody>
</table>

(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 150ºC (302ºF) 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**
*Dow Corning* 3110, 3112, and 3120 can be used in electronic applications using the S Tin NW or F catalysts. The cured rubbers exhibit good dielectric properties.

In potting with *Dow Corning* RTV Rubbers, 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. To apply *Dow Corning* RTV Rubbers as conformal coatings, 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. 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. Before handling, read product and safety data sheets and container labels for safe use, physical and health hazard information. The material safety data sheet is available on the *Dow Corning* website at dowcorning.com. You can also obtain a copy from your local *Dow Corning* sales representative or Distributor or by calling your local *Dow Corning* Global Connection.

**USABLE LIFE AND STORAGE**
When stored at or below 32°C (89.6°F) in the original unopened containers, *Dow Corning* 3110 has a usable life of 18 months from the date of production. *Dow Corning* 3112 and 3120 have a usable life of 24 months from the date of production. *Dow Corning* 4 and S Tin NW Catalysts have a usable life of 24 months; F catalyst has a usable life of...
12 months from the date of production.

PACKAGING INFORMATION
Please contact your local Dow Corning sales representative for the current container sizes available.

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

HEALTH AND ENVIRONMENTAL INFORMATION
To support Customers in their product safety needs, Dow Corning has an extensive Product Stewardship organization and a team of Product Safety and Regulatory Compliance (PS&RC) specialists available in each area.

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

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