Shin-Etsu Silicone’s electrical, electronic and general industrial use RTV rubber, in liquid or paste form, has been developed primarily for the gluing, sealing, and potting of electrical and electronic equipment.

As electrical and electronic equipment becomes smaller, lighter, and more sophisticated, ever higher quality and performance is required of their structural components and materials. Shin-Etsu Silicone’s high-performance RTV rubber products can meet a wide variety of needs, offering outstanding heat and low-temperature resistance, weather resistance, and electrical properties.

Our wide range of products contributes to increased reliability of electrical and electronic equipment and communications equipment.

**Features of RTV Rubber**

- Curing properties
- Adhesion
- Electrical properties
- Weather resistance / Durability
- Chemical resistance
- Low-molecular-weight siloxane
- Various additives
- Primers

**Selection Guide**

**Performance Characteristics**

- **Curing properties**
- **Adhesion**
- **Electrical properties**
- **Weather resistance / Durability**
- **Chemical resistance**
- **Low-molecular-weight siloxane**
- **Various additives**
- **Primers**

**Contents**

- **Features of RTV Rubber**
- **Selection Guide**
- **Performance Characteristics**
- **Product Listing by Intended Use**
- **Product List**
- **Packaging and Colors**
- **Handling Precautions**
- **Directions for Usage**

**RTV**

RTV stands for Room Temperature Vulcanizing. RTV rubber changes from a liquid state to a solid (or elastic body) by a variety of curing methods. Our lineup features Shin-Etsu’s original products of different viscosities, with various distinctive properties. You can choose products that meet the needs of your specific application.
<table>
<thead>
<tr>
<th>Features of RTV Rubber</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Heat and cold resistance</strong>&lt;br&gt;They can be used at temperatures ranging from -50°C to +250°C. They remain flexible even when used continuously from -40°C to +180°C.</td>
<td><strong>Shock resistance</strong>&lt;br&gt;For applications such as vibration insulation of optical pickups.&lt;br&gt;After curing, they absorb shock and vibration, which prevents damage to electrical and electronic components, glass, and other delicate objects.</td>
</tr>
<tr>
<td><strong>Adhesion</strong>&lt;br&gt;Suitable for heat-dissipating seals of heat pipes.&lt;br&gt;They exhibit outstanding adhesive strength on numerous materials including metals, glass, and plastics. There are types available that suit a variety of different applications, substrates, and usage conditions. For certain substrates, the use of a primer is recommended.</td>
<td><strong>Oil and chemical resistance</strong>&lt;br&gt;For sealing and potting of equipment and sensors for automotive use.&lt;br&gt;Resistance to chemicals and oils is far better than that of organic rubber. Products include gasoline-resistant and engine-oil-resistant formulations.</td>
</tr>
<tr>
<td><strong>Electrical properties</strong>&lt;br&gt;For moisture-proof coating of electrodes and other applications.&lt;br&gt;Their ability to maintain stable electrical properties even through environmental changes such as temperature and humidity changes makes them ideal for insulation sealing applications in electrical and electronic equipment.</td>
<td><strong>Weather resistance</strong>&lt;br&gt;For sealing equipment used outdoors.&lt;br&gt;With superior resistance to ultraviolet rays, ozone and water, these products can be exposed to outdoor conditions for long periods of time resulting in little if any deterioration.</td>
</tr>
<tr>
<td><strong>Non-solvent formulations</strong>&lt;br&gt;For coating various substrates.&lt;br&gt;Non-solvent adhesives and coating agents are available. (There are also solvent types available.)</td>
<td><strong>Waterproof and airtight</strong>&lt;br&gt;Suitable for sealing various household ceramics.&lt;br&gt;After curing these products exhibit outstanding waterproof and airtight performance. They are ideal for sealing electronic parts and equipment that are vulnerable to moisture, and for sealing in the bathroom, kitchen, or wherever water is used.</td>
</tr>
</tbody>
</table>
### Types of curing reactions

Shown below are RTV rubbers of different reaction types, each with distinctive characteristics.

### Curing reaction types and characteristics of RTV rubbers

<table>
<thead>
<tr>
<th>Curing reaction</th>
<th>Characteristics</th>
<th>Generated gas</th>
<th>RTV classification</th>
<th>Handling classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condensation reaction</td>
<td>The curing reaction begins upon exposure to atmospheric moisture. Small quantities of gases are generated during curing.</td>
<td>Acetone, Alcohol, Oxime, Acetic acid</td>
<td>Acetone type, Alcohol type, Oxime neutral type, Acetic acid type</td>
<td>Room-temperature curing type</td>
</tr>
<tr>
<td>Addition reaction</td>
<td>Heating will accelerate the curing process with almost no curing shrinkage.</td>
<td>None</td>
<td>Addition type</td>
<td>Heat curing type Room-temperature curing type</td>
</tr>
<tr>
<td>UV reaction *1</td>
<td>Cures rapidly through exposure to UV rays.</td>
<td>None</td>
<td>UV type</td>
<td>—</td>
</tr>
</tbody>
</table>

* Data regarding the viscosity of individual products are not specification values.

*1 UV cure products require detailed explanation, so please contact the nearest Shin-Etsu Sales Department directly.

*2 Oxime gas: MEKO (Methyl ethyl ketoxime)

#### Viscosity (Flowability, workability)

| Viscosity classification: classified according to the standards shown below. Products may be suitable for applications other than those listed. To see the appearance, please refer to the photos on page 2. |
|---|---|---|
| Up to 25 Pa·s | Low viscosity | Coating |
| 25-50 Pa·s | Medium viscosity | Potting, sealing |
| 50-100 Pa·s | High viscosity | Sealing |
| Over 100 Pa·s | Paste | Sealing |

* Data regarding the viscosity of individual products are not specification values.
RTV rubbers each have their respective workability and storability characteristics, and are divided into one-component and two-component types.

### General properties of silicone rubber (comparison)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>One-component type</th>
<th>Two-component type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room-temperature-curing type</td>
<td>Blending</td>
<td>Heat-curing type</td>
</tr>
<tr>
<td>Deaeration(^1)</td>
<td>Unnecessary</td>
<td>Required</td>
</tr>
<tr>
<td>Deep-curing</td>
<td>Inferior</td>
<td>Excellent</td>
</tr>
<tr>
<td>Cure speed regulation</td>
<td>Impossible</td>
<td>Impossible</td>
</tr>
<tr>
<td>Accelerated curing</td>
<td>Impossible</td>
<td>Heating</td>
</tr>
<tr>
<td>Storability</td>
<td>Air tight, room-temperature storage</td>
<td>Refrigeration required</td>
</tr>
</tbody>
</table>

*1 Deaeration: the process of allowing a substance to stand, or degassing to remove interfused air bubbles that may degrade dielectric properties.

*2 Please refer to the handling precautions on page 31.

### Comparison with other resins

<table>
<thead>
<tr>
<th>Material</th>
<th>Linear expansion coefficient (1/\text{°C})</th>
<th>Tensile modulus of elasticity (\text{N/mm}^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silicone</td>
<td>(2.4 \times 10^{-4})</td>
<td>0.01-20</td>
</tr>
<tr>
<td>Epoxy</td>
<td>(5.8 \times 10^{-9})</td>
<td>2000-5000</td>
</tr>
<tr>
<td>Polyurethane</td>
<td>(1.2 \times 10^{-5})</td>
<td>70-3000</td>
</tr>
<tr>
<td>Acrylic</td>
<td>(1.0 \times 10^{-6})</td>
<td>(\text{N/mm}^2)</td>
</tr>
</tbody>
</table>

(Room temperature: 23°C)
The required curing time for room-temperature-curing types is dependent on the thickness of the rubber, the air temperature, and the relative humidity. Curing begins on the surface, so as the thickness increases, the curing time required for the inner portion increases accordingly. Generally, cure speed will accelerate as temperature and humidity rise. At 23°C / 50%RH*, surface curing normally begins after 1 to 60 minutes—a 2 mm sample will become a fully elastic body in about 24 hours. Please note that 3 days are required to achieve full mechanical strength, and about 7 days are required for the product to exhibit certain characteristics including electrical and adhesion properties.

* RH is the abbreviation for Relative Humidity. It is 100 times the value of the water vapor actually contained in the air divided by the saturated water vapor at that air temperature.

### Curing properties

#### Condensation cure type
(One-component type)

#### Relationship between cure speed and temperature and humidity

<table>
<thead>
<tr>
<th>KE-42 (acetic acid type)</th>
<th>KE-348 (acetone type)</th>
<th>KE-45 (oxime neutral type)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness of the cured section (mm)</td>
<td>Thickness of the cured section (mm)</td>
<td>Thickness of the cured section (mm)</td>
</tr>
<tr>
<td>Curing days</td>
<td>Curing days</td>
<td>Curing days</td>
</tr>
<tr>
<td>0</td>
<td>50˚C 100%RH</td>
<td>50˚C 80%RH</td>
</tr>
<tr>
<td>1</td>
<td>50˚C 80%RH</td>
<td>50˚C 60%RH</td>
</tr>
<tr>
<td>2</td>
<td>50˚C 60%RH</td>
<td>50˚C 50%RH</td>
</tr>
<tr>
<td>3</td>
<td>50˚C 50%RH</td>
<td>50˚C 40%RH</td>
</tr>
<tr>
<td>4</td>
<td>50˚C 40%RH</td>
<td>50˚C 30%RH</td>
</tr>
<tr>
<td>5</td>
<td>50˚C 30%RH</td>
<td>50˚C 20%RH</td>
</tr>
<tr>
<td>6</td>
<td>50˚C 20%RH</td>
<td>50˚C 10%RH</td>
</tr>
<tr>
<td>7</td>
<td>50˚C 10%RH</td>
<td>0˚C 95%RH</td>
</tr>
<tr>
<td>8</td>
<td>50˚C 0%RH</td>
<td>0˚C 85%RH</td>
</tr>
<tr>
<td>9</td>
<td>50˚C 5%RH</td>
<td>0˚C 75%RH</td>
</tr>
<tr>
<td>10</td>
<td>50˚C 0%RH</td>
<td>0˚C 60%RH</td>
</tr>
<tr>
<td>11</td>
<td>50˚C 5%RH</td>
<td>0˚C 50%RH</td>
</tr>
<tr>
<td>12</td>
<td>50˚C 0%RH</td>
<td>0˚C 25%RH</td>
</tr>
</tbody>
</table>

#### Cure speed

<table>
<thead>
<tr>
<th>KE-489 Series (alcohol type)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness of the cured section (mm)</td>
</tr>
<tr>
<td>KE4898</td>
</tr>
<tr>
<td>KE4897</td>
</tr>
<tr>
<td>KE4896</td>
</tr>
<tr>
<td>KE4895</td>
</tr>
<tr>
<td>KE4890</td>
</tr>
</tbody>
</table>

### Measuring cure speed

To measure the relationship between rubber thickness and cure time, a polyethylene container is filled with RTV rubber. The inside diameter of the container is 10 mm. The cure time will vary as the thickness of the cured part, temperature and humidity change.

* The data shown is that of typical products. Related products will exhibit similar tendencies.
General one-component addition cure products will cure in 30 minutes to 1 hour when heated to between 100°C and 150°C. They exhibit excellent deep-cure properties and cure uniformly, regardless of thickness. However, curing may be slower in spots where heat is not easily transmitted.

As the following chart shows, physical properties are achieved by heating to 100°C for 1 hour, but some products will not cure even after an hour if not heated to above 80°C.

Note: some products will cure at 80°C but will not possess adhesive strength.

Curing occurs after 5 minutes to 1 hour when heated to temperatures up to 150°C. The higher the curing temperature, the shorter the cure time. Please note that changing the amount of curing agent will not greatly affect cure speed.

Curing inhibition
When addition cure RTV rubber comes in contact with sulfur, phosphorous, nitrogen compounds and substances containing organometallic salts (such as amine-based epoxy curing agents, urethane isocyanates, sulfur vulcanized rubber and soldering flux) defective curing may occur at the point of contact. Please refer to the information about additives on page 14.
Performance Characteristics

**Adhesion**

With the exception of special materials such as polyolefin-based resins and fluoro-resins, condensation cure products exhibit superior adhesion to most materials.

**Condensation cure type**
*(one-component type)*

**Adhesion to various materials**

**KE-348 (acetone type)**

<table>
<thead>
<tr>
<th>Adherend</th>
<th>Adhesion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metal</td>
<td></td>
</tr>
<tr>
<td>Aluminum</td>
<td>○</td>
</tr>
<tr>
<td>Stainless steel</td>
<td>△</td>
</tr>
<tr>
<td>Iron</td>
<td>△</td>
</tr>
<tr>
<td>Chrome</td>
<td>○</td>
</tr>
<tr>
<td>Copper</td>
<td>○</td>
</tr>
<tr>
<td>Melamine-coated board</td>
<td>○</td>
</tr>
<tr>
<td>Vinyl-coated steel plate</td>
<td>○</td>
</tr>
<tr>
<td>Stone</td>
<td></td>
</tr>
<tr>
<td>Glass</td>
<td>○</td>
</tr>
<tr>
<td>Mortar</td>
<td>X</td>
</tr>
<tr>
<td>Tile face</td>
<td>○</td>
</tr>
<tr>
<td>Tile back</td>
<td>△</td>
</tr>
<tr>
<td>Plastic</td>
<td></td>
</tr>
<tr>
<td>Phenol</td>
<td>○</td>
</tr>
<tr>
<td>PVC (hard)</td>
<td>○</td>
</tr>
<tr>
<td>PVC (soft)</td>
<td>○</td>
</tr>
<tr>
<td>Epoxy</td>
<td>○</td>
</tr>
<tr>
<td>Acrylic</td>
<td>X</td>
</tr>
<tr>
<td>FRP</td>
<td>△</td>
</tr>
<tr>
<td>Rubber</td>
<td></td>
</tr>
<tr>
<td>Neoprene</td>
<td>X</td>
</tr>
<tr>
<td>Butyl rubber</td>
<td>X</td>
</tr>
<tr>
<td>Wood</td>
<td>○</td>
</tr>
<tr>
<td>Cedar</td>
<td></td>
</tr>
</tbody>
</table>

- ○: most suitable
- △: suitable
- △: will adhere, but caution required
- X: not suitable

**KE-489 Series (alcohol type)**

<table>
<thead>
<tr>
<th>Adherend Grade</th>
<th>KE-4898</th>
<th>KE-4897</th>
<th>KE-4896</th>
<th>KE-4895</th>
<th>KE-4890</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum</td>
<td>1.0</td>
<td>0.7</td>
<td>0.6</td>
<td>0.4</td>
<td>1.3</td>
</tr>
<tr>
<td>Stainless steel</td>
<td>0.7</td>
<td>0.5</td>
<td>0.4</td>
<td>0.2</td>
<td>1.2</td>
</tr>
<tr>
<td>Copper</td>
<td>0.8</td>
<td>0.5</td>
<td>0.4</td>
<td>0.3</td>
<td>1.4</td>
</tr>
<tr>
<td>Glass</td>
<td>1.0</td>
<td>0.6</td>
<td>0.5</td>
<td>0.4</td>
<td>1.3</td>
</tr>
<tr>
<td>Polycarbonate</td>
<td>0.7</td>
<td>0.5</td>
<td>0.3</td>
<td>0.2</td>
<td>0.3</td>
</tr>
<tr>
<td>ABS</td>
<td>0.8</td>
<td>0.5</td>
<td>0.3</td>
<td>0.2</td>
<td>1.4</td>
</tr>
<tr>
<td>Noryl</td>
<td>0.8</td>
<td>0.5</td>
<td>0.4</td>
<td>0.2</td>
<td>1.4</td>
</tr>
<tr>
<td>Epoxy</td>
<td>0.8</td>
<td>0.5</td>
<td>0.3</td>
<td>0.2</td>
<td>1.5</td>
</tr>
<tr>
<td>PBT</td>
<td>0.7</td>
<td>0.5</td>
<td>0.4</td>
<td>0.2</td>
<td>1.2</td>
</tr>
<tr>
<td>Acrylic</td>
<td>0.8</td>
<td>0.5</td>
<td>0.3</td>
<td>0.2</td>
<td>0.4</td>
</tr>
</tbody>
</table>

Curing conditions: 23±2°C / 50±5% RH for 7 days, measured in compliance with JIS K 6249. (Not specified values)

Tensile speed: 50 mm/min

**Change in adhesive strength over time**

KE-3475 / KE-347 / KE-348 (acetone type)

As shown in the graph, the adhesive strength increases as curing progresses. Although it varies depending on the thickness of the rubber, a cure time of at least 7 days is usually required to reach full adhesive strength.

Testing method: complies with JIS K 6249.

**Lap shear strength with various materials**

KE-3427/KE-3428 (acetone type)

<table>
<thead>
<tr>
<th>Lap shear strength MPa (cohesion break rate %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adherend</td>
</tr>
<tr>
<td>Glass</td>
</tr>
<tr>
<td>Aluminum</td>
</tr>
<tr>
<td>SUS</td>
</tr>
<tr>
<td>Copper</td>
</tr>
<tr>
<td>Iron</td>
</tr>
<tr>
<td>Brass</td>
</tr>
<tr>
<td>Acrylic</td>
</tr>
<tr>
<td>ABS</td>
</tr>
<tr>
<td>Epoxy</td>
</tr>
<tr>
<td>Nylon 6</td>
</tr>
<tr>
<td>Nylon66</td>
</tr>
<tr>
<td>Noryl</td>
</tr>
<tr>
<td>PVC (hard)</td>
</tr>
<tr>
<td>Polyester</td>
</tr>
<tr>
<td>PBT</td>
</tr>
<tr>
<td>Bakelite</td>
</tr>
<tr>
<td>Polystyrol</td>
</tr>
<tr>
<td>PPS</td>
</tr>
<tr>
<td>SPS</td>
</tr>
</tbody>
</table>

(Not specified values)
### KE-200 (two-component acetone type)

<table>
<thead>
<tr>
<th>Adherend</th>
<th>Lap shear strength MPa</th>
<th>Cohesion break rate %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epoxy</td>
<td>0.27</td>
<td>100</td>
</tr>
<tr>
<td>Polyester</td>
<td>0.32</td>
<td>100</td>
</tr>
<tr>
<td>PBT</td>
<td>0.16</td>
<td>0</td>
</tr>
<tr>
<td>PVC</td>
<td>0.25</td>
<td>100</td>
</tr>
<tr>
<td>Acrylic</td>
<td>0.14</td>
<td>0</td>
</tr>
<tr>
<td>Polycarbonate</td>
<td>0.30</td>
<td>100</td>
</tr>
<tr>
<td>Phenol</td>
<td>0.26</td>
<td>100</td>
</tr>
<tr>
<td>Nylon 66</td>
<td>0.27</td>
<td>100</td>
</tr>
<tr>
<td>Nylon 6</td>
<td>0.27</td>
<td>100</td>
</tr>
<tr>
<td>Iron</td>
<td>0.30</td>
<td>100</td>
</tr>
<tr>
<td>Copper</td>
<td>0.30</td>
<td>100</td>
</tr>
<tr>
<td>Stainless steel</td>
<td>0.28</td>
<td>100</td>
</tr>
</tbody>
</table>

(Not specified values)

Curing conditions: 23±2°C / 50±5% RH for 3 days.
Testing method: complies with JIS K 6249.

Cohesion break: a condition in which the materials do not separate at the surface, but break in the materials themselves, or in which all material is left on the surface.

### Lap shear strength with various materials

**Addition cure products exhibit superior adhesion to epoxy (non-amine-based) and aluminum. There are also products available that adhere to engineering plastics such as PBT and PPS.**

#### (one-component type)

<table>
<thead>
<tr>
<th>Adherend</th>
<th>KE-1820 Lap shear strength MPa (cohesion break rate %)</th>
<th>KE-1830 Lap shear strength MPa (cohesion break rate %)</th>
<th>FE-61 Lap shear strength MPa (cohesion break rate %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glass</td>
<td>2.7 (100)</td>
<td>2.5 (100)</td>
<td>0.90 (100)</td>
</tr>
<tr>
<td>Aluminum</td>
<td>2.5 (100)</td>
<td>2.5 (100)</td>
<td>0.90 (100)</td>
</tr>
<tr>
<td>Stainless steel</td>
<td>2.1 (100)</td>
<td>2.5 (100)</td>
<td>1.0 (100)</td>
</tr>
<tr>
<td>Nickel</td>
<td>2.1 (100)</td>
<td>2.0 (100)</td>
<td>0.90 (100)</td>
</tr>
<tr>
<td>Chrome</td>
<td>2.5 (100)</td>
<td>2.3 (100)</td>
<td>0.90 (100)</td>
</tr>
<tr>
<td>Copper</td>
<td>2.1 (100)</td>
<td>1.9 (100)</td>
<td>0.90 (100)</td>
</tr>
<tr>
<td>Epoxy</td>
<td>2.0 (100)</td>
<td>1.8 (100)</td>
<td>0.90 (100)</td>
</tr>
<tr>
<td>Polycarbonate</td>
<td>0.50 (0)</td>
<td>0.79 (0)</td>
<td>0.73 (50)</td>
</tr>
<tr>
<td>PBT</td>
<td>2.0 (100)</td>
<td>2.5 (100)</td>
<td>0.90 (100)</td>
</tr>
</tbody>
</table>

(Not specified values)

Testing method: complies with JIS K 6249.

**Testing the lap shear strength**

The silicone rubber is applied as shown in the figure. After curing, shear adhesion is measured using a tension tester.

- Curing conditions: condensation cure type 23±2°C / 50±5% RH for 7 days.
- Addition cure type 120°C for 1 hour.
- Silicone rubber thickness: 2 mm
- Adhesive surface: 10 x 25 mm
- Tensile speed: 50 mm/min
### Performance Characteristics

#### Electrical properties

<table>
<thead>
<tr>
<th>KE-4898</th>
<th>Conditions</th>
<th>Initial: 25°C</th>
<th>100°C/200h</th>
<th>200°C/200h</th>
<th>100°C/500h</th>
<th>200°C/500h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume resistivity</td>
<td>TΩ·m</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>40</td>
<td>50</td>
</tr>
<tr>
<td>Dielectric breakdown strength (1 mm)</td>
<td>kV</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Dielectric constant 50Hz</td>
<td></td>
<td>2.8</td>
<td>2.8</td>
<td>2.8</td>
<td>2.8</td>
<td>2.7</td>
</tr>
<tr>
<td>Dissipation factor 50Hz</td>
<td></td>
<td>2×10^3</td>
<td>2×10^3</td>
<td>2×10^3</td>
<td>2×10^3</td>
<td>2×10^3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>KE-4896</th>
<th>Conditions</th>
<th>Initial: 25°C</th>
<th>100°C/200h</th>
<th>200°C/200h</th>
<th>100°C/500h</th>
<th>200°C/500h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume resistivity</td>
<td>TΩ·m</td>
<td>50</td>
<td>50</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Dielectric breakdown strength (1 mm)</td>
<td>kV</td>
<td>24</td>
<td>24</td>
<td>24</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Dielectric constant 50Hz</td>
<td></td>
<td>2.8</td>
<td>2.8</td>
<td>2.7</td>
<td>2.7</td>
<td>2.7</td>
</tr>
<tr>
<td>Dissipation factor 50Hz</td>
<td></td>
<td>1×10^3</td>
<td>1×10^3</td>
<td>2×10^3</td>
<td>3×10^3</td>
<td>1×10^3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>KE-4890</th>
<th>Conditions</th>
<th>Initial: 25°C</th>
<th>100°C/200h</th>
<th>200°C/200h</th>
<th>100°C/500h</th>
<th>200°C/500h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume resistivity</td>
<td>TΩ·m</td>
<td>6</td>
<td>30</td>
<td>30</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Dielectric breakdown strength (1 mm)</td>
<td>kV</td>
<td>25</td>
<td>25</td>
<td>24</td>
<td>25</td>
<td>23</td>
</tr>
<tr>
<td>Dielectric constant 50Hz</td>
<td></td>
<td>3.4</td>
<td>3.3</td>
<td>3.4</td>
<td>3.3</td>
<td>3.4</td>
</tr>
<tr>
<td>Dissipation factor 50Hz</td>
<td></td>
<td>1×10^3</td>
<td>1×10^3</td>
<td>1×10^3</td>
<td>1×10^3</td>
<td>1×10^3</td>
</tr>
</tbody>
</table>

Testing method: complies with JIS K 6249.
Curing conditions: 23±2°C / 50±5% RH for 7 days.

#### Heat resistance

<table>
<thead>
<tr>
<th>KE-3417 (heat-resistant, acetone type)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Heat resistance</strong></td>
</tr>
<tr>
<td>Physical properties of rubber (300°C)</td>
</tr>
<tr>
<td>Deterioration (day count)</td>
</tr>
<tr>
<td>Initial</td>
</tr>
<tr>
<td>7days</td>
</tr>
<tr>
<td>14days</td>
</tr>
<tr>
<td>30days</td>
</tr>
<tr>
<td><strong>Heat resistance</strong></td>
</tr>
<tr>
<td>Shear adhesive strength (300°C)</td>
</tr>
<tr>
<td>MPa</td>
</tr>
<tr>
<td>Deterioration (day count)</td>
</tr>
<tr>
<td>Initial</td>
</tr>
<tr>
<td>7days</td>
</tr>
<tr>
<td>14days</td>
</tr>
<tr>
<td>30days</td>
</tr>
</tbody>
</table>

Testing method: complies with JIS K 6249.
(Not specified values)

<table>
<thead>
<tr>
<th>KE-1204 (A/B)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parameter</strong></td>
</tr>
<tr>
<td>Conditions</td>
</tr>
<tr>
<td>Initial: 25°C</td>
</tr>
<tr>
<td>Volume resistivity</td>
</tr>
<tr>
<td>Dielectric breakdown strength (1 mm)</td>
</tr>
<tr>
<td>Dielectric constant 50Hz</td>
</tr>
<tr>
<td>1MHz</td>
</tr>
<tr>
<td>Dissipation factor 50Hz</td>
</tr>
<tr>
<td>1MHz</td>
</tr>
</tbody>
</table>

Testing method: complies with JIS K 6249.
Conditions used to produce the test specimen: 100°C for 30 min.

### Chemical resistance
Weather resistance and durability

KE-45 (Oxime neutral type) – Results of outdoor exposure testing

Physical properties of rubber

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Hardness Durometer A</th>
<th>Tensile strength MPa</th>
<th>Elongation at break %</th>
<th>Estimated luminous intensity J/m²</th>
<th>Estimated precipitation mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial</td>
<td>30</td>
<td>2.3</td>
<td>350</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1 month</td>
<td>35</td>
<td>2.0</td>
<td>370</td>
<td>1.60x10⁷</td>
<td>9.13x10⁷</td>
</tr>
<tr>
<td>3 months</td>
<td>34</td>
<td>2.0</td>
<td>330</td>
<td>5.46x10⁷</td>
<td>2.81x10⁶</td>
</tr>
<tr>
<td>6 months</td>
<td>37</td>
<td>2.0</td>
<td>360</td>
<td>1.44x10⁸</td>
<td>7.74x10⁶</td>
</tr>
<tr>
<td>1 year</td>
<td>37</td>
<td>2.0</td>
<td>320</td>
<td>3.00x10⁸</td>
<td>1.63x10⁶</td>
</tr>
<tr>
<td>2 years</td>
<td>37</td>
<td>1.8</td>
<td>310</td>
<td>5.87x10⁸</td>
<td>3.33x10⁷</td>
</tr>
</tbody>
</table>

Testing method: complies with JIS K 6249.

* The PH-11M-2AT actinometer was used in the tests.

Adhesion

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Maximum tensile stress N/mm²</th>
<th>Cohesion break rate %</th>
<th>Estimated luminous intensity J/m²</th>
<th>Estimated precipitation mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial</td>
<td>0.70</td>
<td>100</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1 month</td>
<td>0.67</td>
<td>100</td>
<td>1.70x10⁷</td>
<td>9.39x10⁷</td>
</tr>
<tr>
<td>3 months</td>
<td>0.69</td>
<td>100</td>
<td>6.75x10⁷</td>
<td>3.98x10⁸</td>
</tr>
<tr>
<td>6 months</td>
<td>0.71</td>
<td>100</td>
<td>1.72x10⁸</td>
<td>9.71x10⁹</td>
</tr>
<tr>
<td>1 year</td>
<td>0.70</td>
<td>100</td>
<td>3.01x10⁹</td>
<td>1.70x10⁹</td>
</tr>
<tr>
<td>2 years</td>
<td>0.71</td>
<td>100</td>
<td>5.82x10⁹</td>
<td>3.37x10⁹</td>
</tr>
</tbody>
</table>

Testing method: complies with JIS A 1439.

* The PH-11M-2AT actinometer was used in the tests.

KE-348 (acetone type) – Adhesion after outdoor submersion in water

<table>
<thead>
<tr>
<th>Adherend</th>
<th>Primer</th>
<th>Measurement parameter</th>
<th>Submersion time (days)</th>
<th>Maximum tensile stress N/mm²</th>
<th>Elongation at break %</th>
<th>Cohesion break rate %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glass</td>
<td>None</td>
<td>Before submersion</td>
<td>—</td>
<td>0.66</td>
<td>230</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>After 7 days</td>
<td>—</td>
<td>0.58</td>
<td>280</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>After 30 days</td>
<td>—</td>
<td>0.49</td>
<td>222</td>
<td>100</td>
</tr>
<tr>
<td>JIS aluminum</td>
<td>C</td>
<td>Before submersion</td>
<td>—</td>
<td>0.72</td>
<td>250</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>After 7 days</td>
<td>—</td>
<td>0.68</td>
<td>230</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>After 30 days</td>
<td>—</td>
<td>0.68</td>
<td>240</td>
<td>100</td>
</tr>
</tbody>
</table>

Testing method: complies with JIS A 1439.

* The PH-11M-2AT actinometer was used in the tests.

KE-3423 (acetone type) – Ozone resistance

We tested deterioration in an ozone atmosphere. There is little deterioration even in adverse environments.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Deterioration time</th>
<th>Start</th>
<th>200</th>
<th>400</th>
<th>600</th>
<th>800</th>
<th>1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>KE-3423</td>
<td>Hardness Durometer A</td>
<td>20</td>
<td>21</td>
<td>20</td>
<td>18</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Elongation at break %</td>
<td>120</td>
<td>110</td>
<td>100</td>
<td>80</td>
<td>80</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Tensile strength MPa</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>0.2</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Curing conditions: 23±2°C / 50±5% RH × 7 days
Deterioration conditions: 23°C / 100 ppm × 1000 h

KE-1830 – Adhesive durability

<table>
<thead>
<tr>
<th>Test conditions</th>
<th>Tensile shear adhesive strength MPa (cohesion break rate %)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PBT</td>
</tr>
<tr>
<td>Initial</td>
<td>2.5 (100)</td>
</tr>
<tr>
<td>Gasoline immersion</td>
<td>25°C / 100h</td>
</tr>
<tr>
<td>Pressure-cooker test</td>
<td>121°C / 50h</td>
</tr>
<tr>
<td></td>
<td>121°C / 100h</td>
</tr>
<tr>
<td>Antifreeze</td>
<td>121°C / 24h</td>
</tr>
<tr>
<td>Salt water spray (JIS Z 2371)</td>
<td>35°C / 24h</td>
</tr>
<tr>
<td>High temperature test</td>
<td>150°C / 100h</td>
</tr>
<tr>
<td>Ozone resistance (80 ppm)</td>
<td>40°C / 300h</td>
</tr>
<tr>
<td>Shock resistance test 1000 cycles</td>
<td>between -55°C and 150°C, 1 hr each</td>
</tr>
</tbody>
</table>

(Not specified values)
### KE-42AL (acetic acid type) – Chemical resistance

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Aqueous solution concentration</th>
<th>External appearance</th>
<th>Hardness Durometer A</th>
<th>Tensile strength MPa</th>
<th>Elongation at break %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric acid</td>
<td>5</td>
<td>No abnormality detected (NAD)</td>
<td>26</td>
<td>2.5</td>
<td>400</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td></td>
<td>27</td>
<td>2.2</td>
<td>440</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td></td>
<td>24</td>
<td>2.0</td>
<td>370</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>Surface adhesion</td>
<td>25</td>
<td>2.5</td>
<td>500</td>
</tr>
<tr>
<td>Hydrochloric acid</td>
<td>5</td>
<td>NAD</td>
<td>25</td>
<td>2.5</td>
<td>450</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td></td>
<td>26</td>
<td>2.2</td>
<td>430</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td></td>
<td>26</td>
<td>1.3</td>
<td>240</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td></td>
<td>23</td>
<td>1.3</td>
<td>310</td>
</tr>
<tr>
<td>Nitric acid</td>
<td>5</td>
<td>NAD</td>
<td>26</td>
<td>2.4</td>
<td>520</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td></td>
<td>21</td>
<td>1.7</td>
<td>450</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>Surface adhesion</td>
<td>20</td>
<td>0.9</td>
<td>250</td>
</tr>
<tr>
<td>Acetic acid</td>
<td>100</td>
<td>Surface adhesion</td>
<td>27</td>
<td>2.5</td>
<td>510</td>
</tr>
<tr>
<td>Casein soda</td>
<td>0.5</td>
<td>NAD</td>
<td>24</td>
<td>2.3</td>
<td>440</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td>27</td>
<td>2.5</td>
<td>450</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td></td>
<td>21</td>
<td>2.0</td>
<td>550</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td></td>
<td>24</td>
<td>3.0</td>
<td>460</td>
</tr>
<tr>
<td>Ammonia</td>
<td>5</td>
<td>NAD</td>
<td>22</td>
<td>1.8</td>
<td>330</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td></td>
<td>22</td>
<td>1.9</td>
<td>380</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td></td>
<td>22</td>
<td>2.3</td>
<td>370</td>
</tr>
<tr>
<td>Pyidine</td>
<td>5</td>
<td>NAD</td>
<td>23</td>
<td>2.3</td>
<td>540</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td></td>
<td>21</td>
<td>1.8</td>
<td>530</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td></td>
<td>20</td>
<td>1.7</td>
<td>510</td>
</tr>
<tr>
<td>Carbon disulfide</td>
<td>–</td>
<td>NAD</td>
<td>26</td>
<td>2.5</td>
<td>410</td>
</tr>
</tbody>
</table>

Curing conditions: 23°C ± 2°C / 50% ± 5% RH ¥ 7 days
Immersion conditions: 23°C ¥ 40 days

### KE-3423 (acetic acid type) – Chemical resistance (coefficient of volumetric expansion)

This was a test of the volumetric expansion of a cured specimen immersed in chemical solutions. The specimen did not dissolve, but did swell.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Item</th>
<th>Gasoline</th>
<th>Engine oil</th>
<th>Gear oil</th>
<th>ATF</th>
</tr>
</thead>
<tbody>
<tr>
<td>KE-3423</td>
<td>%</td>
<td>490</td>
<td>7.4</td>
<td>17</td>
<td>9.1</td>
</tr>
</tbody>
</table>

Shape: 30 × 30 × 2 (mm)
Curing conditions: 23°C ± 2°C / 50% ± 5% RH ¥ 7 days
Immersion conditions: 23°C ¥ 40 h

---

**Silicone and solubility parameter value**

Relationship of solubility parameter values (SP values) of solvents and the expansion coefficient of rubber

Fluorosilicone rubber in particular exhibits outstanding resistance to solvents, but silicone rubber also exhibits superior solvent resistance to that of other rubbers.
Low-molecular-weight (LMW) siloxane

What is LMW siloxane?
The figure at right shows the chemical formula of low-molecular-weight siloxane, a nonreactive cyclic dimethyl polysiloxane (generally D3-D10), which is volatile and therefore sublimates into the atmosphere both during and after curing. As shown below, LMW siloxane has been reported to cause electrical contact failure under certain conditions.

Reduced LMW siloxane products (products that offer an answer to the problem of electrical contact failure)
These are products formulated with reduced levels of LMW siloxane, which has been shown to cause electrical contact failure under certain conditions.

Our products are basically $\sum D_n$ (n=3–10): below 300 ppm or below 500 ppm. Electrical contact failure can occur under the conditions shown below, and while these products are not an absolute remedy, we do recommend the use of reduced LMW siloxane products for electrical and electronic applications. (For information about these products, please refer to pp. 20–21.)

Comparison of LMW siloxane concentration in common products and reduced LMW siloxane products (uncured extraction data)

<table>
<thead>
<tr>
<th>$D_n$</th>
<th>KE-45 (Common products)</th>
<th>KE-3490 (Reduced LMW siloxane products)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>10$&gt;$</td>
<td>10$&gt;$</td>
</tr>
<tr>
<td>4</td>
<td>500</td>
<td>10$&gt;$</td>
</tr>
<tr>
<td>5</td>
<td>260</td>
<td>10$&gt;$</td>
</tr>
<tr>
<td>6</td>
<td>240</td>
<td>10$&gt;$</td>
</tr>
<tr>
<td>7</td>
<td>220</td>
<td>10$&gt;$</td>
</tr>
<tr>
<td>8</td>
<td>160</td>
<td>50</td>
</tr>
<tr>
<td>9</td>
<td>170</td>
<td>50</td>
</tr>
<tr>
<td>10</td>
<td>220</td>
<td>60</td>
</tr>
<tr>
<td>$\sum D_n$ (n=3–10)</td>
<td>1770</td>
<td>160</td>
</tr>
</tbody>
</table>

KE-3490 is a reduced LMW siloxane product, with $\sum D_n$ controlled to below 300 ppm. (Not specified values)

It has already been noted that various substances may lead to contact failure. Contact failure may be caused by organic materials such as human body oils and organic gases, or inorganic materials such as hydrogen sulfide and ammonia gas. Electric and electronic manufacturers report that LMW siloxane can cause contact failure in the low-voltage, low-current range.

Relationship of load conditions to contact reliability

Effects of load on contact reliability (micro-relay)

<table>
<thead>
<tr>
<th>Load</th>
<th>Presence of Si accretion at point of contact (Y/N)</th>
<th>Contact resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 DC1V 1mA</td>
<td>N</td>
<td>No increase measured</td>
</tr>
<tr>
<td>2 DC1V 36mA</td>
<td>N</td>
<td>Occasional increase of several ohms</td>
</tr>
<tr>
<td>3 DC3.5V 1mA</td>
<td>N</td>
<td>No increase measured</td>
</tr>
<tr>
<td>4 DC5.6V 1mA</td>
<td>Y</td>
<td>No increase measured</td>
</tr>
<tr>
<td>5 DC12V 1mA</td>
<td>Y</td>
<td>Increase of several ohms, up to infinity</td>
</tr>
<tr>
<td>6 DC24V 1mA</td>
<td>Y</td>
<td>Around 1500 times, readings of infinity were seen; at 3000 times, all were infinity</td>
</tr>
<tr>
<td>7 DC24V 35mA</td>
<td>Y</td>
<td>Around 3000 times, readings of infinity were seen; at 4500 times, all were infinity</td>
</tr>
<tr>
<td>8 DC24V 100mA</td>
<td>Y</td>
<td>No increase measured</td>
</tr>
<tr>
<td>9 DC24V 200mA</td>
<td>Y</td>
<td>No increase measured</td>
</tr>
<tr>
<td>10 DC24V 1A</td>
<td>Y</td>
<td>No increase measured</td>
</tr>
<tr>
<td>11 DC24V 4A</td>
<td>Y</td>
<td>No increase measured</td>
</tr>
</tbody>
</table>

[Test conditions] Switching frequency: 1 Hz; temp.: room temperature; contact force: 13 g
Presented by: The Institute of Electronics, Information and Communication Engineers (corporation), Yoshimura and Itoh EMC76-41 Feb. 18, 1977.

Mechanisms of contact failure

Cyclic dimethyl polysiloxane vapor
Formation of insulators
Functions as an abrasive
Contact failure
Abraction

Dimethyl polysiloxane HO-[Si(CH$_3$)$_x$O]$_n$-H with a degree of polymerization between 200 and 1000 is used among the prime ingredients of RTV silicone rubber, but the dimethyl polysiloxane derived in the normal manufacturing process does contain ring structures in trace amounts. Because this cyclic dimethyl polysiloxane is nonreactive and volatile, there is sublimation during and sometimes after curing. As shown in the figure above, this sublimated cyclic dimethyl polysiloxane can be a mechanism of contact failure under certain conditions.
### Various additives

1. **Additives used to regulate cure speed**
   In certain applications and working conditions, you may want to control the cure time of two-component RTV. In such cases, please use a cure accelerator or cure retardant. These agents are all effective when added in small amounts.

   **[Precautions]**
   - Be sure to add the prescribed curing agent in the standard, measured amount. Without the addition of the curing agent, the product will not cure, even with the addition of cure accelerators of retardants.
   - Always measure accurately. If a cure accelerator is added in excessive amounts, the product may cure during blending, while excessive amounts of a cure retardant can slow curing to such an extent that the product may not be completely cured even after several days.
   - Additives for condensation cure products and those for addition cure products cannot be used in combination. For example, if a condensation cure type additive is mistakenly added to an addition cure RTV rubber, a faulty cure will result.

   * Please contact the nearest Shin-Etsu Sales Department for details.

2. **Diluents**
   Use RTV Thinner or KE-1204 Thinner as a diluent if you want to reduce the viscosity of the curing agent. For example, by adding 10% RTV Thinner, the viscosity can be reduced by about half. However, excessive amounts of RTV Thinner or KE-1204 Thinner will have adverse effects on the physical properties, so please refer to the figure at right regarding additive quantities. We recommend 10% or below as a standard additive quantity. RTV Thinner and KE-1204 Thinner contain no organic solvents such as toluene or xylene.

### Additive quantity and viscosity change

#### KE-66: Condensation cure type
- **Wetter No.5 (25°C)**

#### KE-66: Condensation cure type
- **Wetter No. 5 (40°C)**

#### KE-1212 (A/B/C): Addition reaction type
- **Control Agent No.6-10 (25°C)**

#### KE-1212 (A/B/C): Addition cure type
- **Control Agent No. 6-10 (20°C)**

### Effects of diluents on various properties
- Base resin viscosity → reduction (major effect)
- Workable time (cure time) → extension (slight effect)
- Hardness, tensile strength → reduction (major effect)
- Elongation → enhancement (slight effect)

* When used with an addition cure product, a small quantity of RTV Thinner can greatly reduce viscosity, but with a degradation of physical properties. If possible, KE1204 Thinner should be used with addition reaction products.

### Relationship of quantity of added diluent and various physical properties
3. Barrier coat
Shin-Etsu Barrier Coat No. 6 is a low viscosity liquid, and can thus be brushed on or applied as a spray. Applying it to the base form can prevent curing inhibition and the mutual adhesion of RTV rubbers. Please note that Shin-Etsu Barrier Coat No. 6 does not have adhesive properties and therefore cannot be used as an adhesion primer.

4. Curing inhibitors of addition cure RTV
Curing inhibitors include such substances as sulfur, phosphorus, nitrogen compounds, water, and organometallic salts. In addition, condensation cure RTV rubber may act as a curing inhibitor.

[Specific examples of curing inhibitors]
- Organic rubbers (natural rubber, and synthetic rubbers such as chloroprene rubber, nitrile rubber, and EPDM)
- Soft PVC resins
- Amine-cured epoxy resins
- Rubber clay and oil clay
- Isocyanates of urethane resins
- Condensation cure RTV rubber
- Some vinyl tape adhesives, glues, paints (polyester-based paints, etc.), waxes, soldering flux, and pine gum

### Primers

#### Primer selection standards

<table>
<thead>
<tr>
<th>Substrates</th>
<th>Grade</th>
<th>KE-41</th>
<th>KE-42</th>
<th>KE-44</th>
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○: Adheres without primer  ×: Won’t adhere even with primer  MT, C, D-2, U, T: name of optimal primer (e.g. U = Primer U)

Primers are pre-treatment agents. The application of a primer on some substrates will ensure better adhesion.

[Method of application]
1. Eliminate moisture, oil, and dirt from the area to be treated.
2. Apply to the adherend with a brush or soft cloth.
3. Air-dry, and allow primer to dry completely before continuing with the next process.

[Precautions]
- Be sure to adequately prepare the substrate surface prior to application. Inadequate preparation may lead to poor adhesion.
- Adhesive strength will vary depending on the materials and surface condition of the adherend. We recommend testing a small sample before full application.
- Always provide adequate ventilation when working.
- Primers fall under the category of UN Hazardous Materials. (See p. 26 for details.) They should never be used near open flame or in high temperature conditions. Primers should be stored in a sealed container in a cool, dark place away from flame.
## Product Listing by Intended Use

### One-component RTV rubber

<table>
<thead>
<tr>
<th>Primary application and characteristics</th>
<th>Grade</th>
<th>Cure type (by-product gas)</th>
<th>Brief description</th>
<th>Intended use</th>
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<tbody>
<tr>
<td>General electrical purpose</td>
<td>KE-3423</td>
<td>Condensation cure (acetone)</td>
<td>Low viscosity, reduced low-molecular-weight (LMW) siloxane</td>
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<td>KE-348</td>
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<td>KE-3495</td>
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<td>KE-4895</td>
<td>Condensation cure (alcohol)</td>
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<td>KE-4898</td>
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<td></td>
<td>KE-1056</td>
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<td>KE-1151</td>
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<td>Thixotropic gel, excellent low-temperature resistance</td>
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<td>KE-1820</td>
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<td>KE-1825</td>
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<td>KE-1831</td>
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<td>KE-1833</td>
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<td>Excellent adhesion to PPS, heat resistant</td>
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<td>KE-1842</td>
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<td>KE-1884</td>
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### Non-flammable (UL certified product *)

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<th>Intended use</th>
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<tbody>
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<td>KE-40RTV</td>
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<tr>
<td>KE-4890</td>
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### Conductivity

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### Super heat resistance

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<td>KE-3417+</td>
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<td>KE-3418+</td>
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### Oil- and solvent-resistance

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<td>X-32-1619</td>
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<td>Oil- and solvent-resistant, low viscosity</td>
<td></td>
<td>25</td>
</tr>
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</table>

*1 See p. 27 for details about UL certified products.  *2 MIL standard: certified to MIL-A-46146A.  *3 Cannot be used as an insulator.  LMW: low-molecular-weight
<table>
<thead>
<tr>
<th>Primary application and characteristics</th>
<th>Grade</th>
<th>Cure type</th>
<th>Brief description</th>
<th>Intended use</th>
<th>Page</th>
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<tbody>
<tr>
<td>Plastic adhesion</td>
<td>KE-3427</td>
<td>Condensation cure (acetone)</td>
<td>Adheres to plastics</td>
<td>○</td>
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<tr>
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<td>KE-3428</td>
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<td>Adheres to plastics</td>
<td>○</td>
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<td>General industrial purpose</td>
<td>KE-41</td>
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<td>High viscosity</td>
<td>○</td>
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<td>KE-42</td>
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<td>Paste</td>
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<td>KE-44</td>
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<td>○</td>
<td>18</td>
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<tr>
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<td>KE-455</td>
<td>Condensation cure (oxime)</td>
<td>Solvent/diluent type</td>
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<td>Two-component (three-component) RTV rubber</td>
<td>KE-103</td>
<td>Addition cure</td>
<td>Transparent rubber, will cure at room temperature</td>
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<tr>
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<td>KE-108</td>
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<td>Transparent rubber, will cure at room temperature</td>
<td>○</td>
<td>22</td>
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<tr>
<td></td>
<td>KE-119</td>
<td>Condensation cure (alcohol)</td>
<td>Potting, high hardness</td>
<td>○</td>
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<td></td>
<td>KE-66</td>
<td>Condensation cure (alcohol)</td>
<td>Potting, self-bonding</td>
<td>○ ○</td>
<td>20, 22</td>
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<td>KE-200</td>
<td>Condensation cure (acetone)</td>
<td>Rapid-cure potting, self-bonding, reduced LMW siloxane</td>
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<td>KE-1800T (A/B)</td>
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<td>KE-1031 (A/B)</td>
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<td>KE-1051J (A/B)</td>
<td>Addition cure</td>
<td>Transparent gel, high viscosity, will cure at room temperature</td>
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<td>KE-1052 (A/B)</td>
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<td>KE-106</td>
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<td>Transparent rubber, high hardness</td>
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<td>KE-109 (A/B)</td>
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<td>Self-bonding</td>
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<td>Non-flammable (UL certified product*4)</td>
<td>KE-1204 (A/B)</td>
<td>Addition cure</td>
<td>Reduced LMW siloxane</td>
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<tr>
<td></td>
<td>KE-1204 (AL/BL)</td>
<td>Addition cure</td>
<td>Low viscosity, reduced LMW siloxane</td>
<td>○</td>
<td>22</td>
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<tr>
<td></td>
<td>KE-1281 (A/B)</td>
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<td>Adhesive, low hardness, reduced LMW siloxane</td>
<td>○ ○</td>
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<td>KE-1800 (A/B/C)</td>
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<td>Adhesive, high hardness</td>
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<td>KE-1801 (A/B/C)</td>
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<td>Adhesive, high hardness</td>
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<td>KE-1802 (A/B)</td>
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<td>Adhesive, high hardness</td>
<td>○</td>
<td>20</td>
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<td>Foaming</td>
<td>KE-513 (A/B)</td>
<td>Condensation cure (hydrogen)</td>
<td>Filling, foaming, triple-volume foam</td>
<td>○</td>
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<td></td>
<td>KE-521 (A/B)</td>
<td>Addition cure (hydrogen)</td>
<td>Filling, foaming, triple-volume foam</td>
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<td>Thermal conductivity</td>
<td>KE-1861 (A/B)</td>
<td>Addition cure</td>
<td>Adhesive, Thermal conductivity (1 W/m·K)</td>
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*1 See p. 27 for details about UL certified products.
LMW: low-molecular-weight
### Sealing – General industrial purpose

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<th>Grade</th>
<th>KE-45</th>
<th>KE-44</th>
<th>KE-441</th>
<th>KE-445</th>
<th>KE-45S</th>
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<tbody>
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<td>Cure type (by-product gas)</td>
<td>Condensation (oxime)</td>
<td>Condensation (oxime)</td>
<td>Condensation (oxime)</td>
<td>Condensation (oxime)</td>
<td>Condensation (oxime)</td>
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<tr>
<td>Brief description</td>
<td>Paste</td>
<td>High viscosity</td>
<td>Low viscosity</td>
<td>Low viscosity</td>
<td>Solvent/diluent type</td>
</tr>
<tr>
<td>Appearance</td>
<td>Consistency</td>
<td>Paste</td>
<td>Viscous liquid</td>
<td>Liquid</td>
<td>Liquid</td>
</tr>
<tr>
<td>Color</td>
<td>See p. 28</td>
<td>See p. 28</td>
<td>See p. 28</td>
<td>See p. 28</td>
<td>See p. 28</td>
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<td>Viscosity</td>
<td>Pa·s</td>
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<td>1.04</td>
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<td>Durometer A</td>
<td>30</td>
<td>25</td>
<td>20</td>
<td>25</td>
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<td>2.0</td>
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<td>Elongation at break</td>
<td>%</td>
<td>350</td>
<td>300</td>
<td>280</td>
<td>200</td>
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<tr>
<td>Volume resistivity</td>
<td>TΩ·m</td>
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<td>5</td>
<td>5</td>
<td>5</td>
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<tr>
<td>Dielectric breakdown strength*</td>
<td>kV</td>
<td>23</td>
<td>20</td>
<td>20</td>
<td>25</td>
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<tr>
<td>Dielectric constant</td>
<td>50 Hz</td>
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<td>2.8</td>
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<td>Dissipation factor</td>
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<td>5x10⁻³</td>
<td>5x10⁻³</td>
<td>5x10⁻³</td>
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<td>0.21</td>
<td>0.21</td>
<td>0.21</td>
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<td>Tack-free time</td>
<td>min</td>
<td>6</td>
<td>40</td>
<td>60</td>
<td>20</td>
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<tr>
<td>Lap shear strength</td>
<td>MPa</td>
<td>1.0 (aluminum)</td>
<td>1.2 (aluminum)</td>
<td>1.0 (aluminum)</td>
<td>0.3 (aluminum)</td>
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</table>

Data: Relationship between cure speed and temperature and humidity (KE44, 45, 441, 42) – p. 6  *Measured by 1mm
Outdoor exposure testing (KE45) – p. 11
Chemical resistance (KE42AL) – p. 12

### Sealing – General electrical purpose

(One-component)

<table>
<thead>
<tr>
<th>Grade</th>
<th>KE-40RTV</th>
<th>KE-42</th>
<th>KE-41</th>
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</thead>
<tbody>
<tr>
<td>Cure type (by-product gas)</td>
<td>Condensation (oxime)</td>
<td>Condensation (acetic acid)</td>
<td>Condensation (acetic acid)</td>
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<tr>
<td>Brief description</td>
<td>UL certified product</td>
<td>Paste</td>
<td>High viscosity</td>
</tr>
<tr>
<td>Appearance</td>
<td>Consistency</td>
<td>Paste</td>
<td>Viscous liquid</td>
</tr>
<tr>
<td>Color</td>
<td>See p. 28</td>
<td>See p. 28</td>
<td>See p. 28</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Pa·s</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Density</td>
<td>g/cm³</td>
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<td>1.05</td>
</tr>
<tr>
<td>Hardness</td>
<td>Durometer A</td>
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<td>28</td>
</tr>
<tr>
<td>Tensile strength</td>
<td>MPa</td>
<td>2.9</td>
<td>2.0</td>
</tr>
<tr>
<td>Elongation at break</td>
<td>%</td>
<td>200</td>
<td>400</td>
</tr>
<tr>
<td>Volume resistivity</td>
<td>TΩ·m</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Dielectric breakdown strength*</td>
<td>kV</td>
<td>25</td>
<td>22</td>
</tr>
<tr>
<td>Dielectric constant</td>
<td>50 Hz</td>
<td>3.9</td>
<td>3.0</td>
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<td>Dissipation factor</td>
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<td>Lap shear strength</td>
<td>MPa</td>
<td>1.0 (aluminum)</td>
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</table>

*Measured by 1mm  (Not specified values)

Data: Relationship between cure speed and temperature and humidity (KE348) – p. 6  *Measured by 1mm
Change in adhesive strength over time (KE3475, 347, 348) – p. 8
Adhesion after outdoor submersion in water (KE348) – p. 11

(Not specified values)
### Sealing – General electrical purpose (one-component)

<table>
<thead>
<tr>
<th>Grade</th>
<th>KE-1820</th>
<th>KE-1825</th>
<th>KE-1830</th>
<th>KE-1831</th>
<th>KE-1833</th>
<th>KE-1842</th>
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<td>Cure type</td>
<td>Addition</td>
<td>Addition</td>
<td>Addition</td>
<td>Addition</td>
<td>Addition</td>
<td>Addition</td>
</tr>
<tr>
<td>Brief description</td>
<td>High viscosity</td>
<td>Paste</td>
<td>High viscosity</td>
<td>Non-flammable UL V-0 certified product</td>
<td>Good adhesion to PPS, heat resistant</td>
<td>Low hardness</td>
</tr>
<tr>
<td>Appearance</td>
<td>Consistency</td>
<td>Paste</td>
<td>Paste</td>
<td>High viscosity</td>
<td>Paste</td>
<td>High viscosity liquid</td>
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<td>Color</td>
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<td>Opaque white</td>
<td>Light gray</td>
<td>Black</td>
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<td>Viscosity</td>
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<td>—</td>
<td>110</td>
<td>200</td>
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<td>1h / 120°C</td>
<td>1h / 120°C</td>
<td>1h / 120°C</td>
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<td>40</td>
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<td>3.3</td>
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<td>600</td>
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<td>5×10⁻³</td>
<td>5×10⁻³</td>
<td>5×10⁻³</td>
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*Measured by 1mm

### Sealing/General electrical purpose (two-component)

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<td>Translucent, adhesive, high strength</td>
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<td>0.6 (Bakelite)</td>
<td>1.7 (polycarbonate)</td>
<td>1.7 (polycarbonate)</td>
<td>1.7 (polycarbonate)</td>
<td>1.5 (PBT)</td>
</tr>
<tr>
<td>Name of curing agent</td>
<td>CAT-118-BL</td>
<td>CAT-RC</td>
<td>KE1800B (KE1800C)</td>
<td>KE1800B (KE1800C)</td>
<td>KE1800B (KE1800C)</td>
<td>—</td>
</tr>
<tr>
<td>Blend ratio</td>
<td>100 / 5</td>
<td>100 / 2</td>
<td>100 / 10 / 2</td>
<td>100 / 10 / 2</td>
<td>100 / 10 / 2</td>
<td>100 / 100</td>
</tr>
</tbody>
</table>

*Measured by 1mm

*Testing method: complies with JIS K 6249. [Conversion to old JIS units] Viscosity: 10 P=1 Pa·s; Strength: 10 kgf/cm²=0.98 MPa; Volume resistivity: 10¹⁰ Ω·cm=1 T Ω·m
### Sealing/reduced low-molecular-weight siloxane types

<table>
<thead>
<tr>
<th>Grade</th>
<th>KE-4898</th>
<th>KE-4897</th>
<th>KE-4896</th>
<th>KE-4895</th>
<th>KE-4890</th>
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<tbody>
<tr>
<td>Cure type (by-product gas)</td>
<td>Condensation (alcohol)</td>
<td>Condensation (alcohol)</td>
<td>Condensation (alcohol)</td>
<td>Condensation (alcohol)</td>
<td>Condensation (alcohol)</td>
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<tr>
<td>Brief description</td>
<td>Condensation (alcohol)</td>
<td>Condensation (alcohol)</td>
<td>Condensation (alcohol)</td>
<td>Condensation (alcohol)</td>
<td>Condensation (alcohol)</td>
</tr>
<tr>
<td>Appearance</td>
<td>Paste</td>
<td>High viscosity</td>
<td>Medium viscosity</td>
<td>Low viscosity</td>
<td>UL certified product</td>
</tr>
<tr>
<td>Consistency</td>
<td>Paste</td>
<td>High viscosity</td>
<td>Medium viscosity</td>
<td>Low viscosity</td>
<td>Paste</td>
</tr>
<tr>
<td>Color</td>
<td>See p. 28</td>
<td>See p. 28</td>
<td>See p. 28</td>
<td>See p. 28</td>
<td>See p. 28</td>
</tr>
<tr>
<td>Viscosity Pa·s</td>
<td>—</td>
<td>100</td>
<td>50</td>
<td>5</td>
<td>—</td>
</tr>
<tr>
<td>Density 23°C g/cm³</td>
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<td>1.06</td>
<td>1.04</td>
<td>1.04</td>
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<td>40</td>
<td>38</td>
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<td>Tensile strength MPa</td>
<td>2.2</td>
<td>2.0</td>
<td>1.7</td>
<td>1.5</td>
<td>2.0</td>
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<tr>
<td>Elongation at break %</td>
<td>360</td>
<td>200</td>
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<td>140</td>
<td>200</td>
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<td>Volume resistivity TΩ·m</td>
<td>30</td>
<td>50</td>
<td>50</td>
<td>90</td>
<td>6</td>
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<tr>
<td>Dielectric breakdown strength* kV</td>
<td>25</td>
<td>24</td>
<td>20</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Dielectric constant 50Hz</td>
<td>2.8</td>
<td>2.8</td>
<td>2.8</td>
<td>2.8</td>
<td>3.4</td>
</tr>
<tr>
<td>Dissipation factor 50Hz</td>
<td>1×10⁻³</td>
<td>1×10⁻³</td>
<td>1×10⁻³</td>
<td>1×10⁻³</td>
<td>4×10⁻³</td>
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<tr>
<td>Thermal conductivity W/m·K</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>0.33</td>
</tr>
<tr>
<td>Tack-free time min</td>
<td>6</td>
<td>12</td>
<td>12</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>Lap shear strength MPa</td>
<td>0.8 (aluminum)</td>
<td>0.8 (aluminum)</td>
<td>0.8 (aluminum)</td>
<td>0.5 (aluminum)</td>
<td>1.3 (aluminum)</td>
</tr>
<tr>
<td>LMW content ΣD₃~D₁₀ ppm</td>
<td>&lt; 300</td>
<td>&lt; 300</td>
<td>&lt; 300</td>
<td>&lt; 300</td>
<td>&lt; 300</td>
</tr>
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* Measured by 1mm
LMW: low-molecular-weight

### One-component room-temperature cure

<table>
<thead>
<tr>
<th>Grade</th>
<th>KE-3490</th>
<th>KE-3494</th>
<th>KE-3498</th>
<th>KE-3497</th>
<th>KE-3495</th>
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</thead>
<tbody>
<tr>
<td>Cure type (by-product gas)</td>
<td>Condensation (acetone)</td>
<td>Condensation (acetone)</td>
<td>Condensation (acetone)</td>
<td>Condensation (acetone)</td>
<td>Condensation (acetone)</td>
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<tr>
<td>Brief description</td>
<td>UL certified product</td>
<td>UL certified product</td>
<td>Paste</td>
<td>Medium viscosity</td>
<td>Low viscosity</td>
</tr>
<tr>
<td>Appearance</td>
<td>Paste</td>
<td>Medium viscosity</td>
<td>Paste</td>
<td>Medium viscosity</td>
<td>Low viscosity</td>
</tr>
<tr>
<td>Consistency</td>
<td>Gray</td>
<td>Gray</td>
<td>See p. 28</td>
<td>See p. 28</td>
<td>See p. 28</td>
</tr>
<tr>
<td>Color</td>
<td>See p. 28</td>
<td>See p. 28</td>
<td>See p. 28</td>
<td>See p. 28</td>
<td>See p. 28</td>
</tr>
<tr>
<td>Viscosity Pa·s</td>
<td>—</td>
<td>50</td>
<td>—</td>
<td>40</td>
<td>4.5</td>
</tr>
<tr>
<td>Density 23°C g/cm³</td>
<td>1.18</td>
<td>1.40</td>
<td>1.07</td>
<td>1.07</td>
<td>1.03</td>
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<tr>
<td>Hardness Durometer A</td>
<td>43</td>
<td>35</td>
<td>45</td>
<td>35</td>
<td>30</td>
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<tr>
<td>Tensile strength MPa</td>
<td>2.5</td>
<td>2.5</td>
<td>3.9</td>
<td>3.0</td>
<td>1.1</td>
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<td>Elongation at break %</td>
<td>350</td>
<td>250</td>
<td>480</td>
<td>250</td>
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<td>Volume resistivity TΩ·m</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Dielectric breakdown strength* kV</td>
<td>28</td>
<td>25</td>
<td>25</td>
<td>24</td>
<td>20</td>
</tr>
<tr>
<td>Dielectric constant 50Hz</td>
<td>3.3</td>
<td>3.5</td>
<td>3.0</td>
<td>3.0</td>
<td>2.8</td>
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<td>Dissipation factor 50Hz</td>
<td>1×10⁻²</td>
<td>1×10⁻²</td>
<td>1×10⁻³</td>
<td>3×10⁻³</td>
<td>3×10⁻³</td>
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<tr>
<td>Thermal conductivity W/m·K</td>
<td>0.25</td>
<td>0.42</td>
<td>0.21</td>
<td>0.21</td>
<td>0.21</td>
</tr>
<tr>
<td>Tack-free time min</td>
<td>6</td>
<td>8</td>
<td>1</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td>Lap shear strength MPa</td>
<td>1.5 (aluminum)</td>
<td>1.5 (aluminum)</td>
<td>1.5 (aluminum)</td>
<td>0.7 (aluminum)</td>
<td>0.3 (aluminum)</td>
</tr>
<tr>
<td>LMW content ΣD₃~D₁₀ ppm</td>
<td>&lt; 300</td>
<td>&lt; 300</td>
<td>&lt; 300</td>
<td>&lt; 300</td>
<td>&lt; 300</td>
</tr>
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* Measured by 1mm
LMW: low-molecular-weight
(Not specified values)
## Sealing/reduced low-molecular-weight siloxane types

<table>
<thead>
<tr>
<th>Grade</th>
<th>KE-3418²</th>
<th>KE-3417²</th>
<th>KE-3427</th>
<th>KE-3428</th>
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</thead>
<tbody>
<tr>
<td>Cure type (by-product gas)</td>
<td>Condensation (acetone)</td>
<td>Condensation (acetone)</td>
<td>Condensation cure (acetone)</td>
<td>Condensation cure (acetone)</td>
</tr>
<tr>
<td>Brief description</td>
<td>Can not be used as an insulator</td>
<td>Can not be used as an insulator</td>
<td>Adheres to plastics</td>
<td>Adheres to plastics</td>
</tr>
<tr>
<td>Appearance</td>
<td>Consistency</td>
<td>Can not be used as an insulator</td>
<td>Can not be used as an insulator</td>
<td>Adheres to plastics</td>
</tr>
<tr>
<td></td>
<td>Color</td>
<td>Black</td>
<td>Black</td>
<td>Gray</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Pa·s</td>
<td>—</td>
<td>45</td>
<td>55</td>
</tr>
<tr>
<td>Density 23°C</td>
<td>g/cm³</td>
<td>—</td>
<td>1.09</td>
<td>1.05</td>
</tr>
<tr>
<td>Hardness Durometer A</td>
<td>—</td>
<td>45</td>
<td>35</td>
<td>24</td>
</tr>
<tr>
<td>Tensile strength MPa</td>
<td>—</td>
<td>2.0</td>
<td>1.4</td>
<td>0.4</td>
</tr>
<tr>
<td>Elongation at break %</td>
<td>—</td>
<td>200</td>
<td>200</td>
<td>260</td>
</tr>
<tr>
<td>Volume resistivity TΩ·m</td>
<td>1×10¹⁰</td>
<td>0.2</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Dielectric breakdown strength*¹ kV</td>
<td>5</td>
<td>5</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>Dielectric constant 50Hz</td>
<td>—</td>
<td>10.5</td>
<td>2.8</td>
<td>2.8</td>
</tr>
<tr>
<td>Dissipation factor 50Hz</td>
<td>—</td>
<td>8×10⁻²</td>
<td>2×10⁻³</td>
<td>2×10⁻³</td>
</tr>
<tr>
<td>Thermal conductivity W/m·K</td>
<td>0.33</td>
<td>0.25</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Tack-free time min</td>
<td>5</td>
<td>12</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Lap shear strength MPa</td>
<td>1.4 (aluminum)</td>
<td>0.8 (aluminum)</td>
<td>0.4 (aluminum)</td>
<td>1.3 (aluminum)</td>
</tr>
<tr>
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<td>&lt;300</td>
<td>&lt;300</td>
<td>&lt;300</td>
<td>&lt;300</td>
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*¹ Measured by 1mm
*² KE-3417 and KE-3418 are not suitable for use as insulators.

(Not specified values)

---

### Product List

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<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cure type (by-product gas)</td>
<td>Condensation (acetone)</td>
<td>Condensation (acetone)</td>
<td>Condensation (acetone)</td>
<td>Addition</td>
<td>Addition</td>
<td>Addition</td>
<td>Addition</td>
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<tr>
<td>Brief description</td>
<td>Reduced ultra-low-molecular-weight siloxane product, UL certified, electrode coating material</td>
<td>Conductive</td>
<td>Conductive</td>
<td>Low-temperature curing</td>
<td>Low-temperature curing</td>
<td>Low-temperature curing</td>
<td>Adhesive, low hardness, UL certified product</td>
</tr>
<tr>
<td>Appearance</td>
<td>Consistency</td>
<td>Low viscosity</td>
<td>Paste</td>
<td>Paste</td>
<td>High viscosity</td>
<td>Low viscosity</td>
<td>Medium viscosity</td>
</tr>
<tr>
<td></td>
<td>Color</td>
<td>Gray</td>
<td>Black</td>
<td>Black</td>
<td>White</td>
<td>Opaque white</td>
<td>White</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Pa·s</td>
<td>20</td>
<td>—</td>
<td>—</td>
<td>100</td>
<td>12</td>
<td>55</td>
</tr>
<tr>
<td>Density 23°C</td>
<td>g/cm³</td>
<td>1.32</td>
<td>1.09</td>
<td>1.88</td>
<td>1.14</td>
<td>1.03</td>
<td>1.22</td>
</tr>
<tr>
<td>Curing conditions, standard cure time</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>1h / 120°C</td>
<td>1h / 120°C</td>
<td>1h / 120°C</td>
<td>1h / 100°C</td>
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<tr>
<td>Hardness Durometer A</td>
<td>50</td>
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<td>85</td>
<td>36</td>
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<td>35</td>
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<tr>
<td>Tensile strength MPa</td>
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<td>2.0</td>
<td>2.9</td>
<td>2.9</td>
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<tr>
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<td>30</td>
<td>230</td>
<td>160</td>
<td>230</td>
<td>140</td>
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<td>Volume resistivity TΩ·m</td>
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<td>2¹</td>
<td>0.002¹</td>
<td>10</td>
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<td>Dielectric breakdown strength² kV</td>
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<td>25</td>
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<td>25</td>
<td>27</td>
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<td>Dielectric constant 50 Hz</td>
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<td>—</td>
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<td>3.1</td>
<td>3.1</td>
<td>3.1</td>
<td>3.5</td>
</tr>
<tr>
<td>Dissipation factor 50 Hz</td>
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<td>—</td>
<td>—</td>
<td>1×10⁻³</td>
<td>1×10⁻³</td>
<td>1×10⁻³</td>
<td>1×10⁻³</td>
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<td>Thermal conductivity W/m·K</td>
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<td>—</td>
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<td>Tack-free time min</td>
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<td>5</td>
<td>2</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>7³</td>
</tr>
<tr>
<td>Lap shear strength MPa</td>
<td>0.4 (aluminum)</td>
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<td>1.0 (aluminum)</td>
<td>2.0 (aluminum)</td>
<td>0.8 (aluminum)</td>
<td>1.6 (aluminum)</td>
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<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>100 / 100</td>
</tr>
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<td>&lt;300</td>
<td>&lt;300</td>
<td>&lt;100</td>
<td>&lt;100</td>
<td>&lt;100</td>
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</table>

*¹ KE-3491, KE-3492: unit = Ω·m
*² KE-3417 and KE-3418 are not suitable for use as insulators.

(Not specified values)

---

*Testing method: complies with JIS K6249.*

[Conversion to old JIS units] Viscosity: 10 P=1 Pa·s; Strength: 10 kgf/cm²=0.98 MPa; Volume resistivity: 10¹³ Ω·cm=1 TΩ·m
## Potting (rubber)

### Two-component room-temperature cure

<table>
<thead>
<tr>
<th>Grade</th>
<th>KE-119</th>
<th>KE-66</th>
<th>KE-103</th>
<th>KE-108</th>
<th>KE-200</th>
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</thead>
<tbody>
<tr>
<td>Cure type (by-product gas)</td>
<td>Condensation (alcohol)</td>
<td>Condensation (alcohol)</td>
<td>Addition</td>
<td>Condensation (alcohol)</td>
<td>Condensation (acetone)</td>
</tr>
<tr>
<td>Brief description</td>
<td>High hardness</td>
<td>Self-bonding</td>
<td>Transparent, room-temperature cure</td>
<td>Transparent, room-temperature cure</td>
<td>Reduced LMW siloxane, rapid cure</td>
</tr>
<tr>
<td>Appearance</td>
<td>Consistency</td>
<td>Low viscosity</td>
<td>Low viscosity</td>
<td>Low viscosity</td>
<td>Liquid</td>
</tr>
<tr>
<td></td>
<td>Color</td>
<td>Reddish brown</td>
<td>Light gray</td>
<td>Colorless transparent</td>
<td>Colorless transparent</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Pa·s</td>
<td>17</td>
<td>5</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>Density 23°C</td>
<td>g/cm³</td>
<td>1.47</td>
<td>1.25</td>
<td>0.97</td>
<td>0.98</td>
</tr>
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<td>Curing conditions, standard cure time</td>
<td>72h / 23°C</td>
<td>72h / 23°C</td>
<td>72h / 23°C</td>
<td>72h / 23°C</td>
<td>72h / 23°C</td>
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<tr>
<td>Hardness</td>
<td>Durometer A</td>
<td>68</td>
<td>40</td>
<td>24</td>
<td>31</td>
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<tr>
<td>Tensile strength</td>
<td>MPa</td>
<td>5.0</td>
<td>1.5</td>
<td>0.2</td>
<td>—</td>
</tr>
<tr>
<td>Elongation at break</td>
<td>%</td>
<td>100</td>
<td>140</td>
<td>100</td>
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<td>Volume resistivity</td>
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<td>25</td>
<td>20</td>
<td>23</td>
</tr>
<tr>
<td>Dielectric constant 50 Hz</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Dissipation factor 50 Hz</td>
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<td></td>
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<tr>
<td>Thermal conductivity</td>
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<td>2.0</td>
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<td>3.0</td>
<td>6.0</td>
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<tr>
<td>Lap shear strength</td>
<td>MPa</td>
<td>—</td>
<td>0.6 (copper)</td>
<td>0.6 (Bakelite)</td>
<td>—</td>
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<td>Name of curing agent</td>
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<td>CAT-RP</td>
<td>CAT-RC</td>
<td>CAT-103</td>
<td>CAT-108</td>
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<td>Blend ratio</td>
<td>100 / 10</td>
<td>100 / 2</td>
<td>100 / 5</td>
<td>100 / 5</td>
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<tr>
<td>LMW content ΣD3–D10 ppm</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>&lt; 500</td>
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</table>

Data: Adhesion to various materials (KE200) — p. 8  
*1 Measured by 1mm  
*2 Not a reduced LMW siloxane product

### Two-component heat cure

<table>
<thead>
<tr>
<th>Grade</th>
<th>KE-1204 (A/B)</th>
<th>KE-1204 (AL/BL)</th>
<th>KE-1031 (A/B)</th>
<th>KE-106</th>
<th>KE-109 (A/B)</th>
<th>KE-1281 (A/B)</th>
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<td>Cure type</td>
<td>Addition</td>
<td>Addition</td>
<td>Addition</td>
<td>Addition</td>
<td>Addition</td>
<td>Addition</td>
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<td>Brief description</td>
<td>UL certified product, low hardness, reduced LMW siloxane</td>
<td>Transparent, adhesive</td>
<td>Transparent, high strength</td>
<td>Transparent, adhesive</td>
<td>UL certified product, low hardness, reduced LMW siloxane</td>
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<td>Appearance</td>
<td>Consistency</td>
<td>Liquid</td>
<td>Liquid</td>
<td>Liquid</td>
<td>Liquid</td>
<td>Liquid</td>
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<tr>
<td></td>
<td>Color</td>
<td>A: reddish brown / B: light gray</td>
<td>A: reddish brown / B: light gray</td>
<td>A/B: colorless transparent</td>
<td>Colorless transparent</td>
<td>A/B: colorless transparent</td>
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<tr>
<td>Viscosity</td>
<td>Pa·s</td>
<td>A: 6 / B: 4</td>
<td>A: 4 / B: 2</td>
<td>A: 1 / B: 0.7</td>
<td>3.5</td>
<td>A: 1 / B: 1</td>
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<tr>
<td>Density 23°C</td>
<td>g/cm³</td>
<td>1.54</td>
<td>1.52</td>
<td>0.97</td>
<td>1.02</td>
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<td>Curing conditions, standard cure time</td>
<td>15min / 100°C</td>
<td>15min / 100°C</td>
<td>2h / 80°C</td>
<td>30min / 150°C</td>
<td>1h / 100°C</td>
<td>1h / 100°C</td>
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<tr>
<td>Hardness</td>
<td>Durometer A</td>
<td>70</td>
<td>65</td>
<td>20</td>
<td>56</td>
<td>25</td>
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<td>Tensile strength</td>
<td>MPa</td>
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<td>3.0</td>
<td>0.4</td>
<td>8.0</td>
<td>1.5</td>
</tr>
<tr>
<td>Elongation at break</td>
<td>%</td>
<td>70</td>
<td>80</td>
<td>150</td>
<td>100</td>
<td>150</td>
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<td>Volume resistivity</td>
<td>TΩ·m</td>
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<td>2</td>
<td>0.1</td>
<td>3</td>
<td>5</td>
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<td>Dielectric breakdown strength*1</td>
<td>kV</td>
<td>27</td>
<td>27</td>
<td>20</td>
<td>23</td>
<td>24</td>
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<tr>
<td>Dielectric constant 50 Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Dissipation factor 50 Hz</td>
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<td></td>
<td></td>
<td></td>
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<td>Thermal conductivity</td>
<td>W/m·K</td>
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<td>0.29</td>
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<td>0.15</td>
<td>0.15</td>
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<td>Workable time 23°C</td>
<td>h</td>
<td>8.0</td>
<td>8.0</td>
<td>4.0</td>
<td>2.0</td>
<td>8.0</td>
</tr>
<tr>
<td>Lap shear strength</td>
<td>MPa</td>
<td>—</td>
<td>—</td>
<td>0.1 (aluminum)</td>
<td>—</td>
<td>0.2 (aluminum)</td>
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<tr>
<td>Name of curing agent</td>
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<td></td>
<td></td>
<td>CAT-RG</td>
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<td>Blend ratio</td>
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<td>100 / 100</td>
<td>100 / 100</td>
<td>100 / 100</td>
<td>100 / 100</td>
<td>100 / 100</td>
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<tr>
<td>LMW content ΣD3–D10 ppm</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>&lt; 500</td>
</tr>
</tbody>
</table>

Data: Relationship between cure speed and time (KE1204) — p. 7  
*1 Measured by 1mm  
*2 Not a reduced LMW siloxane product  
LMW: low-molecular-weight

### Testing method: complies with JIS K 6249.  
[Conversion to old JIS units]  
Viscosity: 10 P=1 Pa·s; Strength: 10 kgf/cm²=0.98 MPa; Volume resistivity: 10°Ω·cm=1 TΩ·m

---

**Product List**

- UL certified product, low hardness, reduced LMW siloxane
- Transparent, adhesive
- Transparent, high strength
- Transparent, adhesive
- UL certified product, low hardness, reduced LMW siloxane

---

[Not specified values]
### Potting (gel)

<table>
<thead>
<tr>
<th>Grade</th>
<th>One-component heat cure</th>
<th>Two-component room-temperature cure</th>
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</thead>
<tbody>
<tr>
<td>KE-1056</td>
<td>KE-1151</td>
<td>KE-1051J (A/B)</td>
</tr>
<tr>
<td><strong>Cure type</strong></td>
<td>Addition</td>
<td>Addition</td>
</tr>
<tr>
<td><strong>Brief description</strong></td>
<td>Low-temperature-resistant, transparent gel</td>
<td>Low-temperature-resistant, thixotropic gel</td>
</tr>
<tr>
<td><strong>Appearance</strong></td>
<td>Consistency</td>
<td>Color</td>
</tr>
<tr>
<td>KE-1056</td>
<td>KE-1151</td>
<td>FE-57</td>
</tr>
<tr>
<td><strong>Appearance</strong></td>
<td>Consistency</td>
<td>Color</td>
</tr>
<tr>
<td>KE-1056</td>
<td>KE-1151</td>
<td>FE-57</td>
</tr>
<tr>
<td><strong>Appearance</strong></td>
<td>Consistency</td>
<td>Color</td>
</tr>
</tbody>
</table>

- *1 1000 mPa·s = 1 Pa·s
- *2 Hardness (penetration) – see figure below.
- *3 Testing temperature: 23°C
- *4 Measured by 1mm

---

**Hardness (penetration)**

Because the modulus of elasticity of silicone gel is less than 10⁵ N/mm², it cannot be measured with common sclerometers.

Hardness (penetration) is usually measured as illustrated in the figure below. Furthermore, there is a correlation between penetration and modulus of elasticity.
## Coating

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Cure type (by-product gas)</td>
<td>Condensation (acetone)</td>
<td>Condensation (acetone)</td>
<td>Condensation (acetone)</td>
<td>Condensation (alcohol)</td>
<td>Condensation (acetone)</td>
<td>Addition</td>
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<td>Brief description</td>
<td>Reduced LMW siloxane product</td>
<td>Low viscosity</td>
<td>Reduced LMW siloxane product</td>
<td>Reduced LMW siloxane product</td>
<td>Reduced LMW siloxane product</td>
<td>Low viscosity, low hardness</td>
<td>Reduced LMW siloxane, low-temperature curing</td>
</tr>
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<td>Appearance</td>
<td>Consistency</td>
<td>Color</td>
<td>Viscosity Pa·s</td>
<td>Density 23°C g/cm³</td>
<td>Curing conditions, standard cure time</td>
<td>Hardness</td>
<td>Tensile strength MPa</td>
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<td></td>
<td>Consistency</td>
<td>Color</td>
<td>Pa·s</td>
<td>g/cm³</td>
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<td></td>
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</tr>
<tr>
<td></td>
<td>Consistency</td>
<td>Low viscosity</td>
<td>Low viscosity</td>
<td>Low viscosity</td>
<td>Low viscosity</td>
<td>Low viscosity</td>
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<tr>
<td></td>
<td>Color</td>
<td>Straw-colored transparent</td>
<td>See p. 28</td>
<td>See p. 28</td>
<td>See p. 28</td>
<td></td>
<td></td>
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<tr>
<td>Consistency</td>
<td>Viscosity</td>
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<td>4.5</td>
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<td>1.03</td>
<td>1.04</td>
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<td>—</td>
<td>—</td>
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<td>1h / 120°C</td>
<td>1h / 120°C</td>
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<tr>
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<td>Durometer A</td>
<td>20</td>
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<td>30</td>
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<td>50</td>
<td>10</td>
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<td>Tensile strength</td>
<td>MPa</td>
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<td>1.0</td>
<td>1.1</td>
<td>1.5</td>
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<tr>
<td>Elongation at break</td>
<td>%</td>
<td>140</td>
<td>200</td>
<td>200</td>
<td>140</td>
<td>180</td>
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<td>2.80</td>
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<td>60</td>
<td>100</td>
<td>60</td>
<td>20</td>
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<tr>
<td>Diellectic breakdown strength</td>
<td>kV</td>
<td>25</td>
<td>22</td>
<td>20</td>
<td>20</td>
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<td>2.9</td>
<td>2.9</td>
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<td>1.4 × 10⁻³</td>
<td>1.4 × 10⁻³</td>
<td>1.4 × 10⁻³</td>
<td>1.4 × 10⁻³</td>
<td>1.4 × 10⁻³</td>
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<td>Thermal conductivity</td>
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<td>0.21</td>
<td>0.21</td>
<td>—</td>
<td>0.4</td>
<td>—</td>
</tr>
<tr>
<td>Tack-free time</td>
<td>min</td>
<td>5</td>
<td>5</td>
<td>11</td>
<td>11</td>
<td>6</td>
<td>—</td>
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<tr>
<td>Lap shear strength</td>
<td>MPa</td>
<td>0.3 (aluminum)</td>
<td>0.4 (aluminum)</td>
<td>0.3 (aluminum)</td>
<td>0.5 (aluminum)</td>
<td>0.4 (aluminum)</td>
<td>0.2 (aluminum)</td>
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<td>LMW content</td>
<td>ΣD³–D₁₀ ppm</td>
<td>&lt; 300</td>
<td>—³</td>
<td>&lt; 300</td>
<td>&lt; 300</td>
<td>ΣD³–D₁₀ &lt; 300²</td>
<td>—³</td>
</tr>
</tbody>
</table>

*1 Measured by 1mm  
*2 KE3442G is a high-grade product, ΣDn (n=3~20) < 300 ppm  
*3 Not a reduced LMW siloxane product  
LMW: low-molecular-weight  
(Not specified values)

## Thermally conductive types

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<tbody>
<tr>
<td>Cure type (by-product gas)</td>
<td>Condensation (acetone)</td>
<td>Condensation cure (acetone)</td>
<td>Condensation cure (acetone)</td>
<td>High viscosity</td>
<td>High viscosity</td>
<td>Reduced LMW siloxane product, UL certified</td>
<td>Adhesive, thermally conductive</td>
</tr>
<tr>
<td>Brief description</td>
<td>Reduced LMW siloxane product</td>
<td>Reduced LMW siloxane product, UL certified</td>
<td>Reduced LMW siloxane product, UL certified</td>
<td>High viscosity</td>
<td>High viscosity</td>
<td>Reduced LMW siloxane product, UL certified</td>
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<td>Paste</td>
<td>Medium viscosity</td>
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<td>White</td>
<td>White</td>
<td>Gray</td>
<td>Gray</td>
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<td>Viscosity</td>
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<td>1h / 120°C</td>
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<td>%</td>
<td>70</td>
<td>30</td>
<td>30</td>
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<td>50 Hz</td>
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<td>5.9</td>
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<td>50 Hz</td>
<td>2 × 10⁻³</td>
<td>4.7 × 10⁻³</td>
<td>4.0 × 10⁻³</td>
<td>1.6 × 10⁻³</td>
<td>2.0 × 10⁻³</td>
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<td>Thermal conductivity</td>
<td>W/m·K</td>
<td>1.6</td>
<td>1.9</td>
<td>2.4</td>
<td>0.83</td>
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<td>Tack-free time</td>
<td>min</td>
<td>1</td>
<td>7</td>
<td>4</td>
<td>—</td>
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<td>MPa</td>
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<td>1.0 (aluminum)</td>
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<td>Name of curing agent</td>
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<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Blend ratio</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

*1 Measured by 1mm  
*2 Workable time (23°C : h)  
*3 Not a reduced LMW siloxane product  
LMW: low-molecular-weight  
(Not specified values)
### Foams

<table>
<thead>
<tr>
<th>Grade</th>
<th>Two-component room-temperature cure KE-513 (A/B)</th>
<th>KE-521 (A/B)</th>
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<tbody>
<tr>
<td>Cure type (by-product gas)</td>
<td>Condensation (hydrogen)</td>
<td>Addition (hydrogen)</td>
</tr>
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<td>Brief description</td>
<td>Triple-volume foaming</td>
<td>Triple-volume foaming</td>
</tr>
<tr>
<td>Appearance Consistency</td>
<td>Low viscosity</td>
<td>Low viscosity</td>
</tr>
<tr>
<td>Color</td>
<td>A: white / B: black</td>
<td>A: black / B: white</td>
</tr>
<tr>
<td>Viscosity Pa·s</td>
<td>A: 4 / B: 6</td>
<td>A: 8 / B: 3</td>
</tr>
<tr>
<td>Density 23°C g/cm³</td>
<td>Approx. 0.5</td>
<td>Approx. 0.5</td>
</tr>
<tr>
<td>Curing conditions, standard cure time</td>
<td>24h / 23°C</td>
<td>24h / 23°C</td>
</tr>
<tr>
<td>Hardness Durometer A</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Tensile strength MPa</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Elongation at break %</td>
<td>110</td>
<td>120</td>
</tr>
<tr>
<td>Volume resistivity TΩ·cm</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Dielectric breakdown strength*1 kV</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Dielectric constant 50 Hz</td>
<td>2.6</td>
<td>2.2</td>
</tr>
<tr>
<td>Dissipation factor 50 Hz</td>
<td>2×10⁻³</td>
<td>5×10⁻³</td>
</tr>
<tr>
<td>Thermal conductivity W/m·K</td>
<td>0.22</td>
<td>0.23</td>
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<tr>
<td>Workable time 23°C h</td>
<td>0.2</td>
<td>0.15</td>
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<tr>
<td>Blend ratio</td>
<td>100:10</td>
<td>100:100</td>
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*1 Measured by 1mm (Not specified values)

### Oil- and solvent-resistant types (fluorosilicone)

<table>
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<tr>
<th>Grade</th>
<th>One-component room-temperature cure FE-123</th>
<th>FE-61</th>
<th>One-component heat cure X-32-1619</th>
<th>FE-57</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cure type (by-product gas)</td>
<td>Condensation (acetic acid)</td>
<td>Addition</td>
<td>Addition</td>
<td>Addition</td>
</tr>
<tr>
<td>Brief description</td>
<td>Oil- and solvent-resistant</td>
<td>Oil- and solvent-resistant</td>
<td>Oil- and solvent-resistant</td>
<td>Oil- and solvent-resistant gel</td>
</tr>
<tr>
<td>Appearance Consistency</td>
<td>Paste</td>
<td>Medium viscosity</td>
<td>Low viscosity</td>
<td>Low viscosity</td>
</tr>
<tr>
<td>Color</td>
<td>See p. 28</td>
<td>Light gray</td>
<td>Light gray</td>
<td>Light brown</td>
</tr>
<tr>
<td>Viscosity Pa·s</td>
<td>—</td>
<td>60</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>Density 23°C g/cm³</td>
<td>1.34</td>
<td>1.43</td>
<td>1.46</td>
<td>1.28</td>
</tr>
<tr>
<td>Curing conditions, standard cure time</td>
<td>—</td>
<td>1h / 120°C</td>
<td>1h / 120°C</td>
<td>2h / 125°C</td>
</tr>
<tr>
<td>Hardness Durometer A</td>
<td>40</td>
<td>25</td>
<td>25</td>
<td>—</td>
</tr>
<tr>
<td>Tensile strength MPa</td>
<td>2.5</td>
<td>1.7</td>
<td>1.1</td>
<td>—</td>
</tr>
<tr>
<td>Elongation at break %</td>
<td>250</td>
<td>170</td>
<td>130</td>
<td>—</td>
</tr>
<tr>
<td>Volume resistivity TΩ·cm</td>
<td>0.1</td>
<td>2.0</td>
<td>2.0</td>
<td>20</td>
</tr>
<tr>
<td>Dielectric breakdown strength*1 kV</td>
<td>17</td>
<td>18</td>
<td>18</td>
<td>—</td>
</tr>
<tr>
<td>Dielectric constant 50 Hz</td>
<td>8.0</td>
<td>6.5</td>
<td>6.5</td>
<td>7.0</td>
</tr>
<tr>
<td>Dissipation factor 50 Hz</td>
<td>3×10⁻³</td>
<td>1×10⁻³</td>
<td>1×10⁻²</td>
<td>1×10⁻²</td>
</tr>
<tr>
<td>Thermal conductivity W/m·K</td>
<td>0.17</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Tack-free time min</td>
<td>5</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Lap shear strength MPa</td>
<td>1.0 (aluminum)</td>
<td>0.6 (aluminum)</td>
<td>0.2 (aluminum)</td>
<td>—</td>
</tr>
</tbody>
</table>

*1 Measured by 1mm (Not specified values)

---

Testing method: complies with JIS K 6249.

[Conversion to old JIS units] Viscosity: 10 P≈1 Pa·s; Strength: 10 kgf/cm²=0.98 MPa; Volume resistivity: 10¹²Ω·cm=1 TΩ·m
### Primers

<table>
<thead>
<tr>
<th>Grade</th>
<th>RTV type compatibility</th>
<th>Intended substrate</th>
<th>Characteristics</th>
<th>Drying time 23°C (min)</th>
<th>Usage amount (g/m²)</th>
<th>Packaging</th>
<th>UN No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primer C</td>
<td>One-component condensation cure type</td>
<td>Glass, enamel, tile, porcelain, metal, plastic</td>
<td>Straw-colored transparent liquid, volatile oil</td>
<td>15</td>
<td>35</td>
<td>100g (bottle)</td>
<td>250g (square can)</td>
</tr>
<tr>
<td>Primer MT</td>
<td>One-component condensation cure type</td>
<td>Stone, mortar, slate, concrete</td>
<td>Colorless transparent liquid, toluene, isopropanol</td>
<td>30</td>
<td>200</td>
<td>100g (bottle)</td>
<td>250g (square can)</td>
</tr>
<tr>
<td>Primer T</td>
<td>One- and two-component condensation cure types</td>
<td>Plastic</td>
<td>Colorless transparent liquid, toluene, isopropanol</td>
<td>15</td>
<td>50</td>
<td>100g (bottle)</td>
<td>250g (square can)</td>
</tr>
<tr>
<td>Primer D2</td>
<td>One-component condensation cure type</td>
<td>Fluorine paint, PVC, plastic</td>
<td>Colorless transparent liquid, ethanol</td>
<td>30</td>
<td>100</td>
<td>100g (bottle)</td>
<td>250g (square can)</td>
</tr>
<tr>
<td>Primer U</td>
<td>One-component condensation cure type</td>
<td>Plastic, metal</td>
<td>Colorless transparent liquid, volatile oil</td>
<td>15</td>
<td>30</td>
<td>100g (bottle)</td>
<td>250g (square can)</td>
</tr>
<tr>
<td>Primer S</td>
<td>One- and two-component condensation cure types</td>
<td>Metals</td>
<td>Colorless transparent liquid</td>
<td>30</td>
<td>35</td>
<td>100g (bottle)</td>
<td>250g (square can)</td>
</tr>
<tr>
<td>Primer No. 4</td>
<td>One- and two-component addition cure types</td>
<td>Plastic, metal</td>
<td>Aliphatic hydrocarbon</td>
<td>40</td>
<td>35</td>
<td>100g (bottle)</td>
<td>—</td>
</tr>
</tbody>
</table>

Data: primer selection standards – p. 15; preparation and usage – p. 30

### Curing agents

<table>
<thead>
<tr>
<th>Grade</th>
<th>Compatible base resin</th>
<th>Consistency and appearance</th>
<th>Packaging</th>
<th>UN No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAT-103</td>
<td>KE-103</td>
<td>Colorless transparent liquid</td>
<td>50g (bottle)</td>
<td>1kg (can)</td>
</tr>
<tr>
<td>CAT-RG</td>
<td>KE-106</td>
<td>Colorless transparent liquid</td>
<td>100g (bottle)</td>
<td>1kg (can)</td>
</tr>
<tr>
<td>CAT-108</td>
<td>KE-108</td>
<td>Colorless or straw-colored liquid</td>
<td>50g (bottle)</td>
<td>1kg (can)</td>
</tr>
<tr>
<td>CAT-118-BL</td>
<td>KE-118</td>
<td>Blue, transparent liquid</td>
<td>50g (bottle)</td>
<td>1kg (can)</td>
</tr>
<tr>
<td>CAT-RC</td>
<td>KE-66</td>
<td>Colorless transparent liquid</td>
<td>50g (bottle)</td>
<td>1kg (can)</td>
</tr>
<tr>
<td>CAT-RP</td>
<td>KE-119</td>
<td>Light blue liquid</td>
<td>100g (bottle)</td>
<td>1kg (can)</td>
</tr>
<tr>
<td>CX-200</td>
<td>KE-200</td>
<td>Blue liquid</td>
<td>100g (bottle)</td>
<td>1kg (can)</td>
</tr>
<tr>
<td>KE-1800B</td>
<td>KE-1800 KE-1801 KE-1802</td>
<td>Colorless transparent</td>
<td>100g (bottle)</td>
<td>1kg (can)</td>
</tr>
<tr>
<td>KE-1800C</td>
<td>KE-1800 KE-1801 KE-1802</td>
<td>Colorless or straw-colored</td>
<td>25g (bottle)</td>
<td>—</td>
</tr>
</tbody>
</table>
### Diluents, Additives, and Coatings

<table>
<thead>
<tr>
<th>Category</th>
<th>Diluent</th>
<th>Additive</th>
<th>Coating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade</td>
<td>Thinners</td>
<td>Cure accelerator</td>
<td>Cure retardant</td>
</tr>
<tr>
<td>Characteristics</td>
<td>Colorless transparent liquid</td>
<td>Colorless transparent liquid</td>
<td>Colorless transparent liquid</td>
</tr>
<tr>
<td>Compatible base resin</td>
<td>Two-component condensation cure type</td>
<td>Two-component addition cure type</td>
<td>Two-component condensation cure type</td>
</tr>
<tr>
<td>Usage amount</td>
<td>As needed per application (&lt;10%)</td>
<td>0.1 - 0.5%</td>
<td>Up to 1%</td>
</tr>
<tr>
<td>Effect</td>
<td>Can be used to adjust viscosity, but will also change general physical properties.</td>
<td>Can be used to adjust viscosity if used in the proportions shown above.</td>
<td>Greatly reduces cure time. Please note that workable time will also decrease proportionately.</td>
</tr>
<tr>
<td>Precautions</td>
<td>Excessive amounts will adversely affect physical properties. Be sure to measure 1204 Thinner accurately.</td>
<td>Additives for condensation cure products and addition cure products differ, and cannot be used interchangeably. With cure accelerators and retardants, always accurately measure the specified curing agent and add the standard amount.</td>
<td>Cannot be used as an adhesive primer.</td>
</tr>
<tr>
<td>Packaging</td>
<td>1 kg (can)</td>
<td>1 kg (can)</td>
<td>100g (bottle)</td>
</tr>
<tr>
<td>UN No.</td>
<td>NON</td>
<td>NON</td>
<td>NON</td>
</tr>
</tbody>
</table>

**Data:** Relationship of quantity of added diluent and various physical properties — p. 14 Barrier Coat No. 6 — p. 15

**UL listing** General silicone rubbers correspond to UL 94HB, but the following products are UL registered.

**Approved products [File no. E48923]**

| Shin-Etsu grade | Reaction type | Reaction type | Reaction type | Reaction type | Reaction type | Reaction type | Reaction type | Reaction type | Reaction type | Reaction type | Reaction type | Reaction type | Reaction type | Reaction type | Reaction type | Reaction type | Reaction type | Reaction type | Reaction type | Reaction type | Reaction type | Reaction type | Reaction type | Reaction type | Reaction type | Reaction type | Reaction type |
|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| KE-3494         | Condensation (acetone) | KE-3494 | BK, GY | 94V-0 (1.5 mm) | 94V-1 (0.75 mm) |
| KE-3490         | Condensation (acetone) | KE-3490 | BK, GY | 94V-0 (3.0 mm) | 94V-1 (1.0 mm) |
| KE-3497T        | Condensation (acetone) | KE-3497T | WT | 94V-0 (2.0 mm) | 94V-1 (0.8 mm) | 94V-1 (0.9 mm) |
| KE-3497W        | Condensation (acetone) | KE-3497W | WT | 94H-1 (0.75 mm) |
| KE-347          | Condensation (acetone) | KE-347 | CL, WT | 94HB (0.75 mm) |
| KE-4890         | Condensation (acetone) | KE-4890 | ALL* | 94V-0 (0.75 mm) |
| KE-40RTV        | Condensation (acetone) | KE-40RTV | WT, GY | 94V-0 (0.75 mm) |
| KE-45           | Condensation (acetone) | KE-45 | ALL* | 94HB (1.5 mm) |
| KE-441          | Condensation (acetone) | KE-441 | WT, RD, TL | 94HB (1.0 mm) |
| KE-1831         | Addition | KE-1831 | BK | 94V-0 (0.75 mm) |
| KE-1867         | Addition | KE-1867 | GY | 94V-0 (0.8-2.2 mm) |
| KE-200          | Condensation (acetone) | KE-200 | BL | 94HB (1.5 mm) |
| KE-1204 (A/B)   | Condensation (acetone) | KE-1204 | BN | 94V-0 (0.89 mm) |
| KE-1281 (A/B)   | Condensation (acetone) | KE-1281 | NC | 94V-1 (0.8 mm) |
| KE-1800         | Addition | KE-1800 | WT | 94V-0 (3.0 mm) | 94V-1 (1.5 mm) |
| KE-1802         | Addition | KE-1802 | BK | 94V-0 (3.0 mm) | 94V-1 (0.75 mm) |

Figures within brackets ( ) indicate minimum thickness.
* For product colors listed as ALL, refer to packaging and colors — p. 28, 29
# One-component RTV rubber (room-temperature cure type)

<table>
<thead>
<tr>
<th>Grade</th>
<th>100 g × 20 tubes</th>
<th>330 ml × 20 cartridges</th>
<th>1 kg × 10 cans</th>
<th>UN No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>KE-3417</td>
<td>○</td>
<td>○</td>
<td></td>
<td>UN-1993</td>
</tr>
<tr>
<td>KE-3418</td>
<td>○</td>
<td>○</td>
<td></td>
<td>Not applicable</td>
</tr>
<tr>
<td>KE-3423</td>
<td>○</td>
<td>○</td>
<td></td>
<td>Not applicable</td>
</tr>
<tr>
<td>KE-3424G</td>
<td>○ ^1</td>
<td>○</td>
<td></td>
<td>UN-1993</td>
</tr>
<tr>
<td>KE-3427</td>
<td>○</td>
<td>○</td>
<td></td>
<td>Not applicable</td>
</tr>
<tr>
<td>KE-3428</td>
<td>○</td>
<td>○</td>
<td></td>
<td>Not applicable</td>
</tr>
<tr>
<td>KE-3466</td>
<td>○ ^6</td>
<td>○</td>
<td></td>
<td>Not applicable</td>
</tr>
<tr>
<td>KE-3467</td>
<td>○ ^6</td>
<td>○</td>
<td></td>
<td>Not applicable</td>
</tr>
<tr>
<td>KE-347*</td>
<td>○ ○ ○</td>
<td>○</td>
<td></td>
<td>UN-1993</td>
</tr>
<tr>
<td>KE-3475*</td>
<td>○ ○ ○</td>
<td>○</td>
<td></td>
<td>UN-1993</td>
</tr>
<tr>
<td>KE-3479*</td>
<td>○ ○</td>
<td>○</td>
<td></td>
<td>UN-1993</td>
</tr>
<tr>
<td>KE-348*</td>
<td>○ ○ ○</td>
<td>○</td>
<td></td>
<td>Not applicable</td>
</tr>
<tr>
<td>KE-3490</td>
<td>○</td>
<td>○</td>
<td></td>
<td>Not applicable</td>
</tr>
<tr>
<td>KE-3491</td>
<td>○</td>
<td>○</td>
<td></td>
<td>Not applicable</td>
</tr>
<tr>
<td>KE-3492</td>
<td>○ ^2</td>
<td>○</td>
<td></td>
<td>Not applicable</td>
</tr>
<tr>
<td>KE-3493</td>
<td>○</td>
<td>○</td>
<td></td>
<td>Not applicable</td>
</tr>
<tr>
<td>KE-3494</td>
<td>○</td>
<td>○</td>
<td></td>
<td>UN-1993</td>
</tr>
<tr>
<td>KE-3495*</td>
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<td>Not applicable</td>
</tr>
<tr>
<td>KE-3497*</td>
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<td>○</td>
<td></td>
<td>UN-1993</td>
</tr>
<tr>
<td>KE-3498*</td>
<td>○ ○ ○</td>
<td>○</td>
<td></td>
<td>Not applicable</td>
</tr>
<tr>
<td>KE-40RTV*</td>
<td>○ ^4</td>
<td>○</td>
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</tr>
<tr>
<td>KE-41*</td>
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<tr>
<td>KE-42*</td>
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<tr>
<td>KE-44*</td>
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<tr>
<td>KE-441*</td>
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<td></td>
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</tr>
<tr>
<td>KE-445*</td>
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</tr>
<tr>
<td>KE-45*</td>
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</tr>
<tr>
<td>KE-45S*</td>
<td>○ ○ ○</td>
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</tr>
<tr>
<td>KE-4890*</td>
<td>○ ^3</td>
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<tr>
<td>KE-4895*</td>
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<tr>
<td>KE-4896*</td>
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</tr>
<tr>
<td>KE-4897*</td>
<td>○ ○ ○</td>
<td>○</td>
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<td>Not applicable</td>
</tr>
<tr>
<td>KE-4898*</td>
<td>○ ○ ○</td>
<td>○</td>
<td></td>
<td>Not applicable</td>
</tr>
<tr>
<td>FE-123*</td>
<td>○ ^1</td>
<td>○</td>
<td></td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

When ordering products with this mark, please specify the product name, color, packaging, and amount. Example: Tube: KE-45W, 100 g × 20 tubes Cartridge: KE-45-W, 330 ml × 20 cartridges

*1 120 g × 20 tubes  *2 130 g × 20 tubes  *3 140 g × 20 tubes  *4 150 g × 20 tubes  *5 160 g × 20 tubes  *6 250 g × 20 tubes

Please contact our sales department separately regarding 15~20 kg pails.

<table>
<thead>
<tr>
<th>Packaging and Colors</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
</tr>
<tr>
<td>W</td>
</tr>
<tr>
<td>W</td>
</tr>
</tbody>
</table>

* When ordering products with this mark, please specify the product name, color, packaging, and amount.
## One-component RTV rubber (heat cure type)

<table>
<thead>
<tr>
<th>Grade</th>
<th>100 g × 20 tubes</th>
<th>330 ml × 20 cartridges</th>
<th>1 kg × 10 cans</th>
<th>UN No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>KE-1056</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KE-1151</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KE-1820</td>
<td>○: translucent</td>
<td>○: translucent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KE-1825</td>
<td>○: translucent</td>
<td>○: translucent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KE-1830</td>
<td>○: light gray</td>
<td>○: light gray</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KE-1831</td>
<td>○: black</td>
<td>○: black</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KE-1833</td>
<td>○: red brown</td>
<td>○: black / red brown</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KE-1842</td>
<td>○: white</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KE-1862</td>
<td>○: gray</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KE-1867</td>
<td>○: gray</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FE-57</td>
<td>○: light brown</td>
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<td></td>
</tr>
<tr>
<td>FE-61</td>
<td>○: light gray</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KE-1884</td>
<td>○: light gray</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X-32-1619</td>
<td>○: light gray</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X-32-1947</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X-32-1964</td>
<td>○: white</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X-32-2020</td>
<td>○: gray</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1 200 g × 20 tubes
*2 130 g × 20 tubes

## Two-component RTV rubber (room-temperature cure and heat cure types)

<table>
<thead>
<tr>
<th>Grade</th>
<th>1 kg × 10 cans</th>
<th>16 kg can</th>
<th>20 kg can</th>
<th>UN No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>KE-66'</td>
<td>○: light gray</td>
<td>○: light gray</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KE-103'</td>
<td>○: transparent</td>
<td>○: transparent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KE-1031 (A/B)</td>
<td>○: transparent</td>
<td>○: transparent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KE-1051J (A/B)</td>
<td>○: transparent</td>
<td>○: transparent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KE-1052 (A/B)</td>
<td>○: transparent</td>
<td>○: transparent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KE-106'</td>
<td>○: transparent</td>
<td>○: transparent (18 kg)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KE-108'</td>
<td>○: transparent</td>
<td>○: transparent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KE-109 (A/B)</td>
<td>○: transparent</td>
<td>○: transparent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KE-118'</td>
<td>○: light gray</td>
<td>○: light gray</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KE-119'</td>
<td>○: red brown</td>
<td>○: red brown</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KE-1204 (A/B)</td>
<td>○: Agent A: red brown / Agent B: white</td>
<td>○: Agent A: red brown / Agent B: white</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KE-1204 (AL/BL)</td>
<td>○: Agent A: red brown / Agent B: white</td>
<td>○: Agent A: red brown / Agent B: white</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KE-1281 (A/B)</td>
<td>○: Agent A: black / Agent B: light gray</td>
<td>○: Agent A: black / Agent B: light gray</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KE-1800 (A/B/C)'</td>
<td>○: Agent A: white</td>
<td>○: Agent A: white</td>
<td>Agent A / B: NON / Agent C: UN-1866</td>
<td></td>
</tr>
<tr>
<td>KE-1801 (A/B/C)'</td>
<td>○: Agent A: white</td>
<td>○: Agent A: white</td>
<td>Agent A / B: NON / Agent C: UN-1866</td>
<td></td>
</tr>
<tr>
<td>KE-1802 (A/B/C)'</td>
<td>○: Agent A: black</td>
<td>○: Agent A: black</td>
<td>Agent A / B: NON / Agent C: UN-1866</td>
<td></td>
</tr>
<tr>
<td>KE-1800T (A/B)</td>
<td>○: Agents A/B: transparent</td>
<td>○: Agents A/B: transparent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KE-1861 (A/B)</td>
<td>○: Agent A: white: transparent</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KE-200'</td>
<td>○: transparent</td>
<td>○: transparent (18 kg)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KE-513 (A/B)</td>
<td>○: Agent A: black / Agent B: white</td>
<td>○: Agent A: black / Agent B: white</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KE-521 (A/B)</td>
<td>○: Agent A: black / Agent B: white</td>
<td>○: Agent A: black / Agent B: white</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* For information regarding curing agents, please refer to p. 26.
### One-component RTV rubber – Usage

<table>
<thead>
<tr>
<th>Surface cleaning</th>
<th>Application of primer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using sandpaper or a solvent (toluene, xylene, etc.), thoroughly clean the surface to remove all foreign matter such as rust, oil, dirt, and grime that may impair bonding. Use caution when cleaning plastics with solvents, as some solvents may damage certain plastics.</td>
<td>Apply uniformly using a brush or other tool. Be careful that no spots are missed, as there may be poor adhesion in those areas.</td>
</tr>
</tbody>
</table>

#### Cutting the nozzle
- Affix the attachment nozzle to the end of the tube and cut to the desired diameter.

#### Operation
- Grasping the tube with your hand, squeeze out the contents.

#### Storage
- Remove the nozzle after use and seal tightly. Completely remove residue within the nozzle using a solvent.

#### Tube

#### Cartridge

### Two-component RTV rubber – Usage

#### Before using
Two-component RTV rubber is separated into a primary agent (base resin) and a curing agent, and the curing reaction begins when the two are blended in the prescribed amounts. To some extent, the workable time can be controlled by changing the type and/or amount of the curing agent, or by adjusting the temperature, but the work should be done as quickly as possible. Containers to be used for work should be cleaned prior to use.

#### Pre-blending agitation
- The filling agent may have settled to the bottom of the container, so be sure to stir thoroughly prior to use.

#### Measurement
- Weigh out both the primary agent and curing agent.

#### Blending and stirring
- Blend the primary and curing agents and stir until color is uniform.

#### Application
- Pour into the area to be filled immediately after agitation and deaeration.

#### Deaeration
- Be sure to seal the product tightly before storage. After use, thoroughly clean containers and tools used for mixing and agitation using a solvent or other cleaner.

#### Storage
- If possible, use all at once. If some material remains, use the removed nozzle end as a plug and seal tightly. If tightly resealed, the product can be stored for several days.
Handling Precautions

Handling precautions

1. One-component condensation cure RTV rubber reacts with moisture in the air and begins to cure at the surface. Consequently, the cure speed will vary according to the temperature and humidity of the use environment, but these rubbers do not exhibit good deep-curing and are therefore not suitable for wide-area surface bonding. In addition, please note that if humidity exceeds 100% and water droplets form on the curing rubber, a hydrolytic reaction will precede the crosslinking cure reaction, which will reduce the strength of the post-cured rubber and remain surface tackiness. (See p. 6)

2. Some of the one-component condensation cure RTV rubbers, such as the acetic acid and oxime types, may corrode metal. The acetic acid type may cause rust, and under sealed conditions the oxime type may corrode copper metals. Conduct a test using a small sample to determine whether the product is suitable for the intended application.

3. The electrical insulative properties will temporarily decline during the curing process. But in nearly all cases, the rubber will exhibit its inherent electrical insulative properties once completely cured.

4. Please note that in some cases, the rubber may not cure if it comes in contact with flux or certain other materials.

5. Do not use condensation cure products in a completely enclosed space.

6. If addition cure products become mixed with or come into contact with curing inhibitors (e.g. sulfur, phosphorus, nitrogen compounds, water, organometallic salts, etc.), a defective cure may result, so please use caution. For information about curing inhibitors, see p. 15.

7. Addition cure products should not be used in humid conditions, as this may cause defective curing and poor adhesion.

8. With addition-cure products, please note that minute quantities of hydrogen gas are released during the curing process.

9. One-component condensation cure RTV rubber may yellow over time, but this does not negatively affect the characteristic properties.

4. When using two-component RTV products, be sure to agitate, blend, and deaerate thoroughly. Failure to do so may degrade the characteristics of the rubber.

5. When using an air gun, be sure to set the pressure at a safe and proper level. Pressure should generally not exceed 0.2-0.3 MPa.

Safety and hygiene

1. Be sure to provide adequate ventilation when using condensation cure RTV rubber. During curing, the following gases are generated, depending on the cure type: acetic acid type – acetic acid; alcohol type – methanol; oxime neutral type – methyl ethyl ketoxime (MEKO); acetone type – acetone. If you experience any unpleasant symptoms please move to an area with fresh air.

2. Uncured RTV rubber may irritate skin and mucous membranes, so avoid eye contact and prolonged skin contact. In case of accidental eye contact, flush with water for at least 15 minutes and see a physician. In case of skin contact, immediately wipe off with a dry cloth and wash with soapy water. Contact lens wearers should exercise adequate caution; if uncured RTV rubber enters the eye, the contact lens may become bonded to the eye.

3. When using, be careful not to rub the eyes with the hands. Please take appropriate precautions such as wearing safety glasses.

4. When exposed to high-temperature conditions exceeding 150°C, FE-123, FE-61, FE-57, and X-32-1619 break down and release trace amounts of a poisonous gas, trifluoropropionaldehyde. When using in high-temperature conditions, be sure to provide adequate ventilation.

5. Primers and some RTV silicone rubbers and curing agents are classified as hazardous materials under the laws of certain countries. In such cases, the laws must be followed regarding storage, labeling, and handling.


7. Please read the Material Safety Data Sheet (MSDS) before use. MSDS can be obtained from our Sales Department.

Storage precautions

1. Store between 1°C-30°C, out of direct sunlight. Some products must be stored between 1°C-25°C. Products with “refrigeration required” on the label must be stored below 10°C.

2. With cartridges, as a general rule it is best to completely use up the product once the cartridge has been opened. If any remains, be sure to seal completely.
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