DOWSIL™ EA-4600 LV HM RTV Translucent Adhesive for Device Assembly

Description
DOWSIL™ EA-4600 LV HM RTV Translucent Adhesive is designed to speed assembly of products without compromising their performance. Dispensed at elevated temperatures as a low viscosity material, it quickly achieves green strength within minutes to allow assembly operations to continue. This advanced material delivers primerless adhesion to most common substrates, including plastics, metals and silicone elastomers.

Typical Applications
• Smartphones and accessories
• Tablets, PCs and laptops
• Wearable devices
• Portable device accessories

Potential Uses
• Waterproof bonding and sealing
• Excellent bonding on silicone substrates
• Reliable bonding in harsh environments

DOWSIL™ Silicone Hot Melt Adhesives are uniquely designed to achieve instant green strength when dispensed for more efficient assembly of PCB components and modules.

Their innovative formulation offers excellent resistance to chemicals, moisture and dust to help ensure greater product reliability and performance. The innate flexibility of these silicone adhesives after cure also helps to absorb impact energy to enhance shock and impact resistance. Dow is a leading global supplier of silicone hot melt adhesives for mobile devices, wearables and other applications.

DOWSIL™ EA-4600 LV HM RTV Translucent Adhesive offers:
• Instant green strength
• Primerless adhesion to most common substrates, including plastics, metals and silicones
• Good dispensability using standard hot melt dispensers, including jet dispensing applicators
• Easy removal and re-application within 24 hours
• Long open time and pot life
• Narrow beading
• Lower total cost of ownership than double-sided tape

Hot Melt Application
Assembly Concept

Dispense melted silicone hot melt on parts
Assemble parts with silicone hot melt immediately after dispensing (Apply fixture pressure)
Hot melt will cool, immediately achieving instant adhesion or green strength
Strength builds over time
DOWSIL™ EA-4600 LV HM RTV Translucent Adhesive is a reactive, neutral cure adhesive that can be heated and then applied as a liquid melt.

The material converts to a solid as it cools to room temperature, and reacts with ambient moisture to become a viscoelastic material with enhanced physical properties. DOWSIL™ EA-4600 LV HM RTV Adhesive offers extended service temperatures from -40°C to 150°C. It will soften with the application of high heat to allow easy rework of assembled components, and revert to its typical properties after cooling.

**Application**

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**Process Recommendation**

**Surface Preparation**
Dry and clean with cleaning solvents (IPA, MEK or DOWSIL™ OS Cleaning Solvents) and dry cloth. If necessary, surface modification can be used, e.g., plasma treatment or laser etching.

**Heating: 100~140°C**
For 10-20 min. prior to dispensing. Optional: pre-heat hot melt <100°C for 10-20 min. in a pre-warmer.

**Dispensing**
Use dry air to dispense. <0.5 mm micro-beading is possible.

**Assembly**

**Moisture Curing**
Moisture cure after the initial strong adhesion (green strength).

**Application Troubleshooting**
Minimize exposure of opened containers to ambient air. The recommended application air temperature is 120~140°C.

**Application at temperatures lower than 100°C can cause:**
- Build-up of material on the side of the nozzle, causing offset dispensing
- Difficulty pumping
- Uneven flow from nozzle

**Application at temperatures over 150°C can cause:**
- Material degradation
- Reduced tackiness
- Bubbles in adhesive

**Packaging and Storage**
DOWSIL™ Silicone Hot Melt Adhesives are available in a 30 gram AL syringe. Store at or below 32°C.
# Product Profile and Performance

## DOWSIL™ EA-4600 LV HM RTV Translucent Adhesive

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Translucent to white</td>
</tr>
<tr>
<td>NVC (%)</td>
<td>&gt;98.5</td>
</tr>
<tr>
<td>UV indicator</td>
<td>No</td>
</tr>
<tr>
<td>Open time/Assembly time (min)</td>
<td>15</td>
</tr>
<tr>
<td>Hardness (Duroshore A)</td>
<td>53</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.08</td>
</tr>
<tr>
<td>Tensile Strength (MPa)</td>
<td>4</td>
</tr>
<tr>
<td>Elongation at break (%)</td>
<td>560</td>
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<tr>
<td>Melt Viscosity (Pa-s)</td>
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</tr>
<tr>
<td>at 100°C</td>
<td>25</td>
</tr>
<tr>
<td>at 120°C</td>
<td>14.2</td>
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<tr>
<td>at 140°C</td>
<td>6</td>
</tr>
<tr>
<td>Service temperature range (°C)</td>
<td>-45 to 150</td>
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<tr>
<td>Dielectric Constant</td>
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</tr>
<tr>
<td>at 100 Hz</td>
<td>2.59</td>
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<tr>
<td>at 100 kHz</td>
<td>2.59</td>
</tr>
<tr>
<td>at 1 MHz</td>
<td>2.58</td>
</tr>
</tbody>
</table>

## Jet Dispensing Application

DOWSIL™ EA-4600 LV HM RTV Translucent Adhesive may be jetted via a Nordson Unity PURJet 30 and achieve minimum 0.5 mm width bead lines. For detailed operating parameters, refer to these settings:

1. 30 psi compressed air supply to the syringe applicator
2. Heating zones set at 140°C
3. 0.1 mm diameter nozzle orifice
4. 55 psi dynamic valve pressure
5. Needle interval frequency of 6 ms ON/6 ms OFF (12 ms per cycle = 83 Hz)
6. Piston stroke fixed at 1.5 mm
7. 30 mm·s⁻¹ traverse rate from robotic system
8. 2 mm orifice height from the substrate surface

(Photograph courtesy of Nordson)
Jet Dispensing Application Continued

The optical micrograph shown here illustrates the effect of robot rate generated by the Nordson Unity 4XP Dispensing System. In this application, 530-μm diameter dots were formed at a robot rate of 100 mm·s⁻¹. These discrete dots were overlapped to form a controlled bead width of adhesive on the substrate by slowing the traverse rate of the automated robotic system. For example, a bead width of 870 μm was obtained at a rate of 10 mm·s⁻¹.

Learn More

We bring more than just an industry-leading portfolio of advanced silicone-based materials. As your dedicated innovation leader, we bring proven process and application expertise, a network of technical experts, a reliable global supply base and world-class customer service.

To find out how we can support your applications, visit consumer.dow.com/pcb.