Advanced silicone materials for electric vehicle electronics

Imagine

Improved thermal management, reliability and cost-effectiveness for electric vehicle electronics
The market for plug-in hybrid and battery-powered electric vehicles (xEV) has the potential to grow exponentially in the coming years. But realizing that potential will depend on a number of factors, including the industry’s ability to meet consumer expectations for performance and value.

This will challenge battery makers to design for the large-volume production of lithium battery packs that are smaller, lighter and less expensive. These higher-energy-density packs will be capable of delivering more power, longer, through better thermal control.

Manufacturers and designers of other xEV components – including battery management systems, power control units, DC/DC converters and electric motors – face many of the same thermal management, assembly and protection challenges.

Dow Corning can help, with an extensive portfolio of proven, innovative and emerging silicone technologies for xEV electronics.
The properties that have enabled silicone materials from Dow Corning to excel in a wide range of electronics and automotive applications could prove invaluable in helping you address challenges associated with designing and producing large volumes of lithium battery systems and other components for the electric vehicles of tomorrow:

- Very low thermal resistance
- Flow, wetting, adhesion and cure properties that can help speed and simplify processing
- Excellent thermal stability – wide operating temperature range
- Reliable performance under harsh conditions – resistance to thermal shock, oxidation, moisture and chemicals
- Excellent electrical insulation (dielectric strength)
- Excellent stress relief
FOR THERMAL MANAGEMENT
Thermally conductive silicone materials from Dow Corning have properties that can help you reduce operating temperatures and extend the life and performance of batteries and other electric vehicle electronic components.

Dow Corning offers a wide range of thermal interface materials with the potential for creating effective, efficient designs and assembly applications. Examples of leading technologies include:

- **Thermally conductive silicone adhesives** for coupling the battery pack to the heat sink; also may be appropriate for use within or between cells

- **Noncuring thermally conductive silicone compounds**, with a possible applied temperature range of -40 to 150°C, for conducting heat from the battery cells to the heat sink

- **Thermally conductive silicone gels and encapsulants** are flowable materials that facilitate high-volume processes in automated production; can be used as an alternative to precured pads to couple cells and modules to heat sinks or as conformable gap-fillers

FOR OTHER CHALLENGES
Dow Corning offers proven and innovative materials to help you meet a wide range of electric vehicle application challenges.

- **Silicone gels** for potting of electronics in the battery pack’s power management system

- **Adhesives** for a variety of bonding applications, including staking large capacitors for vibration control, extra support for large components on circuit boards, and housing sealing

- **Conformal coatings** for protecting electronic circuit boards in the power management system

- **Engineered elastomers** for heat-resistant sealing and gasketing
BREAKTHROUGH Technologies

To meet needs for performance, design flexibility and cost control

Dow Corning® EA-7100 Adhesive

A Thermal Radical Cure™ adhesive for use in the assembly of electronics housings and for attaching connectors, electronic control units or sensors to substrates

Dow Corning® EA-7100 Adhesive cures much faster at moderate temperatures than conventional heat-curable silicones, and it may allow you to eliminate some cleaning steps, enabling faster throughput and lower energy costs. Plus, it offers durable adhesion to a broad range of diverse substrates for greater design flexibility. Other quality- and performance-enhancing benefits include adhesion in harsh environments, low void formation, superior anti-corrosion performance and less sensitivity to contamination.

Dow Corning® TC-4525 Thermally Conductive Gap Filler

A cost-effective way to manage the rising heat in next-generation electronics designs

Dow Corning® TC-4525 Thermally Conductive Gap Filler is a soft and compressible silicone material designed to dissipate heat from electronic devices. This high-performing new silicone technology delivers thermal conductivity of 2.5 W/m.K, greatly improved dispensability and stable performance for more reliable electronics in harsh automotive underhood environments.
## xEV Battery Pack

### THERMAL MANAGEMENT

<table>
<thead>
<tr>
<th>Product</th>
<th>1 or 2 Part</th>
<th>Color</th>
<th>Thermal Conductivity, W/m·K</th>
<th>Thermal Resistance, °C/W</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thermally Conductive Gap Fillers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dow Corning® TC-4515 Thermally Conductive Gap Filler</td>
<td>In development</td>
<td>2 part (1:1 mix ratio)</td>
<td>Part A: White Part B: Blue</td>
<td>2.6</td>
</tr>
<tr>
<td>Dow Corning® TC-4525 Thermally Conductive Gap Filler</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dow Corning® TC-4525 GB Thermally Conductive Gap Filler</td>
<td>Glass bead option (180 micron) for Dow Corning® TC-4525 Thermally Conductive Gap Filler</td>
<td>2 part (1:1 mix ratio)</td>
<td>Part A: White Part B: Blue</td>
<td>2.6</td>
</tr>
<tr>
<td>Dow Corning® TC-4529 Thermally Conductive Gap Filler</td>
<td></td>
<td>1 part</td>
<td>Gray</td>
<td>3.2</td>
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<tr>
<td>Dow Corning® TC-4530 Thermally Conductive Gap Filler</td>
<td>In development</td>
<td></td>
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<tr>
<td><strong>Thermally Conductive Adhesives</strong></td>
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<tr>
<td>Dow Corning® TC-2030 Thermally Conductive Adhesive</td>
<td></td>
<td>2 part (1:1 mix ratio)</td>
<td>Gray</td>
<td>2.7</td>
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<tr>
<td>Dow Corning® TC-2035 Thermally Conductive Adhesive</td>
<td></td>
<td>2 part (1:1 mix ratio)</td>
<td>Part A: White Part B: Reddish brown</td>
<td>3.3</td>
</tr>
<tr>
<td>Dow Corning® SE 4485 Thermally Conductive Adhesive</td>
<td>1 part</td>
<td>White</td>
<td>2.8</td>
<td>-</td>
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<tr>
<td>Dow Corning® SE 4485 L Thermally Conductive Adhesive</td>
<td>1 part</td>
<td>White</td>
<td>2.2</td>
<td>-</td>
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<tr>
<td>Dow Corning® SE 4486 Thermally Conductive Adhesive</td>
<td>1 part</td>
<td>White</td>
<td>1.6</td>
<td>-</td>
</tr>
<tr>
<td><strong>Thermally Conductive Encapsulants</strong></td>
<td></td>
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</tr>
<tr>
<td>Dow Corning® TC-4605 Thermally Conductive Encapsulant</td>
<td></td>
<td>2 part (1:1 mix ratio)</td>
<td>Gray</td>
<td>1</td>
</tr>
<tr>
<td>Dow Corning® TC-4605 HLV Thermally Conductive Encapsulant</td>
<td></td>
<td>2 part (1:1 mix ratio)</td>
<td>Gray</td>
<td>1</td>
</tr>
</tbody>
</table>

(1) Tack-free time is the time required for the product to develop a nontacky surface based on adhesion to a polyethylene film.

### ASSEMBLY

<table>
<thead>
<tr>
<th>Product</th>
<th>1 or 2 Part</th>
<th>Color</th>
<th>Viscosity, cP</th>
<th>Density, g/cm³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dow Corning® EA-5151 QIC™ Adhesive(1)</td>
<td>1 part</td>
<td>-</td>
<td>60,000 @ 120°C</td>
<td>1.08</td>
</tr>
<tr>
<td>Dow Corning® 7091 Adhesive/Sealant(2)</td>
<td>1 part</td>
<td>Black, white, gray</td>
<td>-</td>
<td>1.4</td>
</tr>
<tr>
<td>Dow Corning® SE 9168 RTV Adhesive</td>
<td>1 part</td>
<td>Gray</td>
<td>-</td>
<td>Cured: 1.32</td>
</tr>
<tr>
<td>Dow Corning® SE 9185 Clear or White Adhesive</td>
<td>1 part</td>
<td>Clear or white</td>
<td>-</td>
<td>Cured: 1.05</td>
</tr>
<tr>
<td>Dow Corning® EA-1236 Base and Catalyst Special Black Adhesive</td>
<td>2 part; (base-to-catalyst mix ratio by weight: 100 to 14)</td>
<td>Base: White Catalyst: Black</td>
<td>180,000 @ 0.5 s⁻¹ 160,000 @ 5 s⁻¹</td>
<td>Base: 1.31 Catalyst: 1.05 Cured: 1.28</td>
</tr>
<tr>
<td>Dow Corning® 3-8209 Silicone Foam(3)</td>
<td>2 part (1:1 mix ratio)</td>
<td>Part A: Dark gray Part B: Colorless</td>
<td>Part A: 11,000-17,000 Part B: 12,000-17,000</td>
<td>Part A: 1.07 Part B: 1.01 Density: 200-280 (cured at 23°C and tested after 24 hr)</td>
</tr>
</tbody>
</table>

(1) Developmental product data. QIC™: quick-in-connect adhesive. Utilizes silicone technology to achieve instant green strength when dispensed and cures to a strong moisture-cured silicone adhesive.
(2) Glass bead option (180 micron) for
(3) Tack-free time is the time required for the product to develop a nontacky surface based on adhesion to a polyethylene film.
(4) Designed to be dispensed and cured directly on parts to form an integrated compression gasket.
<table>
<thead>
<tr>
<th>Lap Shear</th>
<th>Cure, time/temp.</th>
<th>Viscosity, cP</th>
<th>Density, g/cm³</th>
<th>Durometer</th>
<th>CTE, ppm/K</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>120 min/25°C</td>
<td>Part A: 207,000</td>
<td>2.9</td>
<td>55 (Shore 00)</td>
<td>-50 to 80°C: 95</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>20 min/50°C</td>
<td>Part B: 193,000</td>
<td></td>
<td></td>
<td>-50 to 150°C: 123</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10 min/80°C</td>
<td>Mixed: 217,000</td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>120 min/25°C</td>
<td>Part A: 223,000</td>
<td>Cured: 2.9</td>
<td>40 (Shore 00)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>10 min/80°C</td>
<td>Part B: 216,000</td>
<td></td>
<td>32 (Asker C)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mixed: 217,000</td>
<td></td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>Noncuring</td>
<td>300,000</td>
<td>3.1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

In development:
- 1.8 W/m.K silicone gap filler material for automotive electronics
- Glass bead option (180 micron) for Dow Corning® TC-4525 Thermally Conductive Gap Filler

<table>
<thead>
<tr>
<th>Lap Shear</th>
<th>Cure, time/temp.</th>
<th>Viscosity, cP</th>
<th>Density, g/cm³</th>
<th>Durometer</th>
<th>CTE, ppm/K</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al: 435 psi, 3 MPa, 300 N/cm²</td>
<td>60 min/130°C</td>
<td>Part A: 250,000</td>
<td>2.9</td>
<td>92 (Shore A)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Part B: 200,000</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mixed: 220,000</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Al: 381 psi, 2.63 MPa, 263 N/cm² Cu: 416 psi, 2.87 MPa, 287 N/cm²</td>
<td>30 min/125°C</td>
<td>Part A: 130,000</td>
<td>Wet: 3</td>
<td>95 (Shore A [JIS Type A])</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>10 min/150°C</td>
<td>Part B: 118,000</td>
<td>Mixed: 125,000</td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Glass to glass: 168 psi, 1.2 MPa, 120 N/cm²</td>
<td>Tack-free time(1) @ 25°C: 10 min</td>
<td>Fluidity: 54 mm</td>
<td>Cured: 2.9</td>
<td>90 (Shore A [JIS])</td>
<td>-</td>
<td>UL 94 V-0</td>
</tr>
<tr>
<td>Glass to glass: 262 psi, 1.8 MPa, 180 N/cm²</td>
<td>Tack-free time(1) @ 25°C: 8 min</td>
<td>Fluidity: 47.4 mm</td>
<td>Cured: 2.84</td>
<td>90 (Shore A [JIS])</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Glass to glass: 240 psi, 1.65 MPa, 165 N/cm²</td>
<td>Tack-free time(1) @ 25°C: 4 min</td>
<td>19,600</td>
<td>Fluidity: 60 mm</td>
<td>Cured: 2.6</td>
<td>81 (Shore A [JIS])</td>
<td>-</td>
</tr>
<tr>
<td>Al: 110 psi</td>
<td>60 min/120°C</td>
<td>Part A: 3,100</td>
<td>Cured: 1.67</td>
<td>30 (Shore A)</td>
<td>-</td>
<td>UL flammability @ 1.5 mm: 94 V-0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Part B: 2,500</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mixed: 2,900</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Anodized Al: 220 psi</td>
<td>60 min/120°C</td>
<td>Part A: 1,600</td>
<td>Cured: 1.67</td>
<td>60 (Shore A)</td>
<td>-</td>
<td>UL flammability @ 1.5 mm: 94 V-0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Part B: 1,400</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mixed: 1,900</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

In development:
- Dow Corning developmental material. The composition, features, benefits and other properties are subject to change. The future availability of this product is not guaranteed. You are responsible to determine the suitability of the Product for your contemplated use. The Product is provided “AS IS” WITH ALL FAULTS, AND WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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### Connector

<table>
<thead>
<tr>
<th>Product</th>
<th>1 or 2 Part</th>
<th>Color</th>
<th>Viscosity, cP</th>
<th>Density, g/cm³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sylgard® 567 Silicone Encapsulant</td>
<td>2 part (1:1 mix ratio)</td>
<td>Black</td>
<td>Part A: 2,060 Part B: 570</td>
<td>Uncured: 1.24</td>
</tr>
<tr>
<td><strong>Encapsulants</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Adhesive</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Dow Corning® SE 9186 Clear or White Adhesive</td>
<td>1 part</td>
<td>Clear or white</td>
<td>64,000</td>
<td>Cured: 1.03</td>
</tr>
<tr>
<td><strong>Silicone Foam</strong></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Dow Corning® 3-6548 Silicone RTV Foam</td>
<td>2 part</td>
<td>Black</td>
<td>Part A: 40,000-60,000 Part B: 50,000-75,000</td>
<td>Part A: 1.05-1.11 Part B: 1.05-1.11 Cured: 0.22-0.32</td>
</tr>
</tbody>
</table>

(1) Tack-free time is the time required for the product to develop a nontacky surface based on adhesion to a polyethylene film.

(2) Silicone RTV foam for fire-resistant penetration seals.

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### Battery Management System (BMS)

#### PCB Protection

<table>
<thead>
<tr>
<th>Product</th>
<th>1 or 2 Part</th>
<th>Color</th>
<th>Viscosity, cP</th>
<th>Density, g/cm³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dow Corning® 3-1953 Conformal Coating</td>
<td>1 part</td>
<td>Translucent</td>
<td>350</td>
<td>Cured: 0.98</td>
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<tr>
<td>Dow Corning® 3-1965 Conformal Coating</td>
<td>1 part</td>
<td>Translucent</td>
<td>115</td>
<td>Cured: 0.99</td>
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<tr>
<td>Dow Corning® 1-2577 Low VOC Conformal Coating</td>
<td>1 part</td>
<td>Transparent</td>
<td>1,050</td>
<td>Cured: 1.12</td>
</tr>
</tbody>
</table>

(1) Tack-free time is the time required for the product to develop a nontacky surface based on adhesion to a polyethylene film.
<table>
<thead>
<tr>
<th>Product 1 or 2</th>
<th>Part Color</th>
<th>Viscosity, cP</th>
<th>Density, g/cm³</th>
<th>Cure, time/tem.</th>
<th>Lap Shear</th>
<th>Durometer</th>
<th>Tensile Strength, MPa</th>
<th>Elongation, %</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>Encapsulants</td>
<td></td>
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</tr>
<tr>
<td>Sylgard® 170 Silicone Elastomer</td>
<td>2 part</td>
<td>Black</td>
<td>Part A: 3,160</td>
<td>Part B: 1,110</td>
<td>Mixed: 2,135</td>
<td>47 (Shore A)</td>
<td>-</td>
<td>-</td>
<td>Thermal conductivity: 0.48 W/m.K</td>
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</tr>
<tr>
<td>Sylgard® 170 Fast Cure Silicone Elastomer</td>
<td>2 part</td>
<td>Black</td>
<td>Part A: 3,436</td>
<td>Part B: 1,287</td>
<td>Mixed: 2,361</td>
<td>41 (Shore A)</td>
<td>-</td>
<td>-</td>
<td>Thermal conductivity: 0.4 W/m.K</td>
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</tr>
<tr>
<td>Sylgard® 567 Silicone Encapsulant</td>
<td>2 part</td>
<td>Black</td>
<td>Part A: 2,060</td>
<td>Part B: 570</td>
<td>Uncured: 1.24</td>
<td>40 (Shore A)</td>
<td>-</td>
<td>-</td>
<td>Thermal conductivity: 0.29 W/m.K</td>
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<tr>
<td>Adhesive</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Dow Corning® SE 9186 Clear or White Adhesive</td>
<td>1 part</td>
<td>Clear or white</td>
<td>64,000</td>
<td>Cured: 1.03</td>
<td>Room temperature cure when exposed to moisture in the air; tack-free time® @ 25°C: max 10 min</td>
<td>20 (Shore A)</td>
<td>2.5</td>
<td>550</td>
<td>-</td>
</tr>
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<tr>
<td>Silicone Foam</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Dow Corning® 3-6548 Silicone RTV Foam(2)</td>
<td>2 part</td>
<td>Black</td>
<td>Part A: 40,000-60,000</td>
<td>Part B: 50,000-75,000</td>
<td>Part A: 1.05-1.11</td>
<td>Part B: 1.05-1.11</td>
<td>Cured: 0.22-0.32</td>
<td>228,000 N/m², 33 psi</td>
<td>Compression deflection:</td>
</tr>
<tr>
<td></td>
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</tr>
</tbody>
</table>

Tack-Free Time® (1), time/tem. | Nonvolatile Content (NVC), % | Durometer | Notes |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>8 min/25°C</td>
<td>0.5 min/60°C (15% RH)</td>
<td>99.4</td>
<td>34 (Shore A)</td>
</tr>
<tr>
<td>6 min/25°C</td>
<td>-</td>
<td>33 (Shore A)</td>
<td>UL 94 V-0; MIL I-46058C Amend 7; IPC-CC-830 with Amendment 1</td>
</tr>
<tr>
<td>6 min/25°C</td>
<td>1.5 min/60°C (15% RH)</td>
<td>NVC – forced draft volatility: 33.6</td>
<td>85 (Shore A) 25 (Shore D)</td>
</tr>
</tbody>
</table>
## Power Control Unit (PCU), Including Inverter, Converter, Etc.

### THERMAL MANAGEMENT

<table>
<thead>
<tr>
<th>Product</th>
<th>1 or 2 Part</th>
<th>Color</th>
<th>Thermal Conductivity, W/m.K</th>
<th>Thermal Resistance, °C/W</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thermally Conductive Compounds</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dow Corning® TC-5026 Thermally Conductive Compound</td>
<td>1 part</td>
<td>Gray</td>
<td>2.9</td>
<td>0.03°C-cm²/W @ 7 µm (40 psi)</td>
</tr>
<tr>
<td>Dow Corning® TC-5625 C Thermally Conductive Compound</td>
<td>1 part</td>
<td>Green gray</td>
<td>2.6</td>
<td>0.1°C-cm²/W (20 psi)</td>
</tr>
<tr>
<td>Dow Corning® SC 4471 CV Thermally Conductive Compound</td>
<td>1 part</td>
<td>White</td>
<td>2</td>
<td>-</td>
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<tr>
<td><strong>Thermally Conductive Gap Fillers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Dow Corning® TC-4515 Thermally Conductive Gap Filler†</td>
<td>In development: 1.8 W/m.K silicone gap filler material for automotive electronics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dow Corning® TC-4525 Thermally Conductive Gap Filler</td>
<td>2 part (1:1 mix ratio)</td>
<td>Part A: White Part B: Blue</td>
<td>2.6</td>
<td>0.42 @ 85 µm 0.73 @ 115 µm 1.23 @ 309 µm</td>
</tr>
<tr>
<td>Dow Corning® TC-4525 GB Thermally Conductive Gap Filler</td>
<td>Glass bead option (180 micron) for Dow Corning® TC-4525 Thermally Conductive Gap Filler</td>
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<td></td>
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<tr>
<td>Dow Corning® TC-4525 CV Thermally Conductive Gap Filler</td>
<td>2 part (1:1 mix ratio)</td>
<td>Part A: White Part B: Blue</td>
<td>2.6</td>
<td>-</td>
</tr>
<tr>
<td>Dow Corning® TC-4529 Thermally Conductive Gap Filler</td>
<td>1 part</td>
<td>Gray</td>
<td>3.2</td>
<td>0.44 @ 78 µm 1.84 @ 400 µm</td>
</tr>
<tr>
<td>Dow Corning® TC-4530 Thermally Conductive Gap Filler†</td>
<td>In development</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dow Corning® Q1-9226 Thermally Conductive Adhesive</td>
<td>2 part (1:1 mix ratio)</td>
<td>Gray</td>
<td>0.8</td>
<td>-</td>
</tr>
<tr>
<td>Dow Corning® 1-4174 Thermally Conductive Adhesive</td>
<td>1 part</td>
<td>Gray</td>
<td>1.78</td>
<td>-</td>
</tr>
<tr>
<td>Dow Corning® TC-2030 Thermally Conductive Adhesive</td>
<td>2 part (1:1 mix ratio)</td>
<td>Gray</td>
<td>2.7</td>
<td>-</td>
</tr>
<tr>
<td>Dow Corning® TC-2035 Thermally Conductive Adhesive</td>
<td>2 part (1:1 mix ratio)</td>
<td>Part A: White Part B: Reddish brown</td>
<td>3.3</td>
<td>0.25 @ 50 µm 0.44 @ 100 µm</td>
</tr>
<tr>
<td>Part</td>
<td>Color</td>
<td>Thermal Conductivity, W/m.K</td>
<td>Thermal Resistance, °C/W</td>
<td>Lap Shear</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>-----------------------------</td>
<td>--------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>1</td>
<td>Gray</td>
<td>2.9</td>
<td>0.03°C-cm²/W</td>
<td>Noncuring</td>
</tr>
<tr>
<td>1</td>
<td>Green</td>
<td>2.6</td>
<td>0.1°C-cm²/W</td>
<td>Noncuring</td>
</tr>
<tr>
<td>1</td>
<td>White</td>
<td>2.0</td>
<td>-</td>
<td>Noncuring</td>
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<tr>
<td>1</td>
<td>Gray</td>
<td>1.8</td>
<td>1.84°C-m²/W</td>
<td>In development</td>
</tr>
<tr>
<td>1</td>
<td>Gray</td>
<td>3.2</td>
<td>0.44°C-m²/W</td>
<td>Noncuring</td>
</tr>
<tr>
<td>1</td>
<td>Gray</td>
<td>2.7</td>
<td>40°C (Shore 00)</td>
<td>In development</td>
</tr>
<tr>
<td>1</td>
<td>Gray</td>
<td>2.6</td>
<td>0.25°C-m²/W</td>
<td>Glass bead option (180 micron)</td>
</tr>
</tbody>
</table>

In development: 1.8 W/m.K silicone gap filler material for automotive electronics

<table>
<thead>
<tr>
<th>Part</th>
<th>Color</th>
<th>Thermal Conductivity, W/m.K</th>
<th>Thermal Resistance, °C/W</th>
<th>Lap Shear</th>
<th>Cure, time/temp.</th>
<th>Viscosity, cP</th>
<th>Density, g/cm³</th>
<th>Durometer</th>
<th>CTE, ppm/K</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gray</td>
<td>2.9</td>
<td>0.03°C-cm²/W</td>
<td>Noncuring</td>
<td>-</td>
<td>120,000</td>
<td>Uncured: 3.5</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1</td>
<td>Gray</td>
<td>2.9</td>
<td>0.03°C-cm²/W</td>
<td>Noncuring</td>
<td>-</td>
<td>300,000</td>
<td>3.1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1</td>
<td>Gray</td>
<td>2.9</td>
<td>0.03°C-cm²/W</td>
<td>Noncuring</td>
<td>-</td>
<td>62,300</td>
<td>Uncured: 2.71</td>
<td>92 (Shore A)</td>
<td>125 ppm/°C</td>
<td>UL 94-V0</td>
</tr>
<tr>
<td>1</td>
<td>Gray</td>
<td>2.9</td>
<td>0.03°C-cm²/W</td>
<td>Noncuring</td>
<td>-</td>
<td>Part A: 250,000 Part B: 200,000 Mixed: 220,000</td>
<td>-</td>
<td>92 (Shore A)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Gray</td>
<td>2.9</td>
<td>0.03°C-cm²/W</td>
<td>Noncuring</td>
<td>-</td>
<td>Part A: 130,000 Part B: 118,000 Mixed: 125,000 Wet: 3</td>
<td>95 (Shore A [JIS Type A]) 45 (Shore D)</td>
<td>50 to 200°C: 92</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

† Dow Corning developmental material. The composition, features, benefits and other properties are subject to change. The future availability of this product is not guaranteed. You are responsible to determine the suitability of the Product for your contemplated use. The Product is provided “AS IS” WITH ALL FAULTS, AND WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.
### Power Control Unit (PCU), Including Inverter, Converter, Etc. (continued)

#### ASSEMBLY

<table>
<thead>
<tr>
<th>Product</th>
<th>1 or 2 Part</th>
<th>Color</th>
<th>Viscosity, cP</th>
<th>Density, g/cm³</th>
<th>Cure, time/temp.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Adhesives</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dow Corning® EA-7100 Adhesive(1)</td>
<td>1 part</td>
<td>Gray</td>
<td>360,000</td>
<td></td>
<td>15 min/100°C</td>
</tr>
<tr>
<td>Dow Corning® EA-5151 QIC™ Adhesive(2)</td>
<td>1 part</td>
<td>-</td>
<td>60,000 @ 120°C</td>
<td>1.08</td>
<td>Room temperature cure when exposed to moisture in the air</td>
</tr>
<tr>
<td>Dow Corning® EA-6060 Adhesive*</td>
<td>1 part</td>
<td>Black</td>
<td>Low shear: 1,020,000 High shear: 235,000</td>
<td>Cured: 1.34</td>
<td>60 min/125°C 30 min/150°C</td>
</tr>
<tr>
<td>Dow Corning® 3-6265 Thixotropic Adhesive</td>
<td>1 part</td>
<td>Black</td>
<td>1,070 Pa-sec</td>
<td>Cured: 1.33</td>
<td>240 min/100°C 25 min/125°C 10 min/150°C</td>
</tr>
<tr>
<td>Dow Corning® 3-6265 HP Adhesive</td>
<td>1 part</td>
<td>Black</td>
<td>82,000</td>
<td>Cured: 1.31</td>
<td>180 min/100°C 30 min/125°C 15 min/150°C</td>
</tr>
<tr>
<td>Dow Corning® 866 Primerless Silicone Adhesive</td>
<td>1 part</td>
<td>Gray</td>
<td>48,000</td>
<td>Cured: 1.29</td>
<td>60 min/125°C 30 min/150°C</td>
</tr>
<tr>
<td>Dow Corning® 7091 Adhesive/Sealant(3)</td>
<td>1 part</td>
<td>Black, white, gray</td>
<td>Extrusion rate: 185 g/min</td>
<td>1.4</td>
<td>Room temperature cure when exposed to moisture in the air; tack-free time(4): 28 min</td>
</tr>
<tr>
<td>Dow Corning® 744 RTV Sealant</td>
<td>1 part</td>
<td>-</td>
<td>Extrusion rate: 184 g/min</td>
<td>Cured: 1.42</td>
<td>Room temperature cure; tack-free time(4): 55 min</td>
</tr>
<tr>
<td>Dow Corning® EA-1236 Base and Catalyst Special Black Adhesive</td>
<td>2 part (base-to-catalyst mix ratio by weight: 100 to 14)</td>
<td>Base: White Catalyst: Black</td>
<td>180,000 @ 0.5 s⁻¹ 160,000 @ 5 s⁻¹</td>
<td>Base: 131 Catalyst: 1.05 Cured: 1.28</td>
<td>Room temperature cure; tack-free time(4): 10 min</td>
</tr>
<tr>
<td><strong>Silicone Foam</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dow Corning® 3-8209 Silicone Foam(6)</td>
<td>2 part (1:1 mix ratio)</td>
<td>Part A: Dark gray Part B: Colorless</td>
<td>Part A: 11,000-17,000 Part B: 12,000-17,000</td>
<td>Part A: 1.07 Part B: 1.01 Density: 200-280 (cured @ 23°C and tested after 24 hr)</td>
<td>Room temperature cure when exposed to moisture in the air; tack-free time(6) @ 25°C: max 10 min</td>
</tr>
</tbody>
</table>

### A: Durable adhesion to a wide variety of substrates, including plastics, metals, cured silicones and other substrates (contact Dow Corning for details).

### B: Developmental product data. QIC™: quick-in-connect adhesive. Utilizes silicone technology to achieve instant green strength when dispensed and cures to a strong moisture-cured silicone adhesive.

### C: Used as formed-in-place gasket (FIPG) material. Mechanical properties: cured 7 days in air at 23°C (73°F) and 50% relative humidity. Extrusion rate measured using 3.18 mm diameter nozzle at 0.62 MPa.

### D: Tack-free time is the time required for the product to develop a nontacky surface based on adhesion to a polyethylene film.

### E: Measured after 7-day cure at room temperature.

### F: Designed to be dispensed and cured directly on parts to form an integrated compression gasket.

#### PCB PROTECTION

<table>
<thead>
<tr>
<th>Product</th>
<th>1 or 2 Part</th>
<th>Color</th>
<th>Viscosity, cP</th>
<th>Density, g/cm³</th>
<th>Cure, time/temp.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conformal Coatings</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dow Corning® 3-1953 Conformal Coating</td>
<td>1 part</td>
<td>Translucent</td>
<td>350</td>
<td>Cured: 0.98</td>
<td></td>
</tr>
<tr>
<td>Dow Corning® 3-1965 Conformal Coating</td>
<td>1 part</td>
<td>Translucent</td>
<td>115</td>
<td>Cured: 0.99</td>
<td></td>
</tr>
<tr>
<td>Dow Corning® 1-2577 Low VOC Conformal Coating</td>
<td>1 part</td>
<td>Transparent</td>
<td>1,050</td>
<td>Cured: 1.12</td>
<td></td>
</tr>
</tbody>
</table>

### (1) Used as formed-in-place gasket (FIPG) material. Mechanical properties: cured 7 days in air at 23°C (73°F) and 50% relative humidity. Extrusion rate measured using 3.18 mm diameter nozzle at 0.62 MPa.

### (2) Tack-free time is the time required for the product to develop a nontacky surface based on adhesion to a polyethylene film.
<table>
<thead>
<tr>
<th>Lap Shear</th>
<th>Durometer</th>
<th>Tensile Strength, MPa</th>
<th>Elongation @ Break, %</th>
<th>Modulus 100%, MPa</th>
<th>Tear Strength, kN/m</th>
<th>Compression Set @ -25%, %</th>
<th>Lap Shear Adhesion, MPa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al: 350 psi, 2.4 MPa, 240 kg/cm² PBT: 375 pcs, 2.6 MPa, 260 N/cm²</td>
<td>43 (Shore A)</td>
<td>3.4</td>
<td>260</td>
<td>247</td>
<td>Durable adhesion to a wide variety of substrates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polycarbonate lap shear adhesion: 1 day: 0.5 MPa 7 days: 1.7 MPa</td>
<td>55-57 (Shore A)</td>
<td>4.5-4.7</td>
<td>&gt;900</td>
<td>-</td>
<td>Can be used with standard hot-melt dispensing equipment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In development

- Al: 611 psi | 60 (Shore A) | 4.8 | 165 | 275 | UV indicator for inspection |
- Al: 825 psi, 5.7 MPa, 568 N/cm² | 68 (Shore A) | 5.8 | 275 | 215 | High tensile strength |
- Al: 712 psi, 4.97 MPa, 497 N/cm² | 57 (Shore A) | 5.4 | 260 | 277 | Able to flow, fill or self-level after dispensing |
- Al: 774.5 psi, 5.34 MPa, 534 N/cm² | 57 (Shore A) | 6.4 | 210 | 350 | High tensile strength |
- | 32 (Shore A) | 2.5 | 680 | - | FIPG(3) |
- Al: 430 psi, 3 MPa, 296 N/cm² | 37 (Shore A) | 2.7 | 590 | - | Bonding large components to circuit boards |
- | 36 (Shore A)(4) | 2.2 | 300 | - | Fast room-temperature cure |
- | 45 (Shore 00) | - | - | - | Compression set @ 50% compression, 22 hr @ 70°C: 32% Post-cured 1 hr @ 100°C: 4% Stress-strain characteristics in compression, 50% compression: 74 KPa |

1 Dow Corning developmental material. The composition, features, benefits and other properties are subject to change. The future availability of this product is not guaranteed. You are responsible to determine the suitability of the Product for your contemplated use. The Product is provided “AS IS” WITH ALL FAULTS, AND WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

<table>
<thead>
<tr>
<th>Tack-Free Time(1), time/temp.</th>
<th>Nonvolatile Content (NVC), %</th>
<th>Durometer</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 min/25°C 0.5 min/60°C (15% RH)</td>
<td>99.4</td>
<td>34 (Shore A)</td>
<td>UL 94 V-0; MIL-I-46058C Amend 7; IPC-CC-830B; UL 746E</td>
</tr>
<tr>
<td>6 min/25°C</td>
<td>-</td>
<td>33 (Shore A)</td>
<td>UL 94 V-0; MIL-I-46058C Amend 7; IPC-CC-830B with Amendment 1</td>
</tr>
<tr>
<td>6 min/25°C 1.5 min/60°C (15% RH)</td>
<td>NVC – forced draft volatility: 33.6</td>
<td>85 (Shore A) 25 (Shore D)</td>
<td>UL 94 V-0; MIL-I-46058C Amend 7; IPC-CC-830B; UL 746E</td>
</tr>
</tbody>
</table>
## Electric Motor

### PROTECTION

<table>
<thead>
<tr>
<th>Product</th>
<th>1 or 2 Part</th>
<th>Color</th>
<th>Thermal Conductivity, W/m.K</th>
<th>Thermal Resistance, °C/W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermally Conductive Encapsulants</td>
<td>Dow Corning® CN-8760 G Thermally Conductive Encapsulant</td>
<td>2 part (1:1 mix ratio)</td>
<td>Dark gray</td>
<td>0.67</td>
</tr>
<tr>
<td></td>
<td>Dow Corning® TC-4605 Thermally Conductive Encapsulant</td>
<td>2 part (1:1 mix ratio)</td>
<td>Gray</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Dow Corning® TC-4605 HLV Thermally Conductive Encapsulant</td>
<td>2 part (1:1 mix ratio)</td>
<td>Gray</td>
<td>1</td>
</tr>
</tbody>
</table>

### PROTECTION (continued)

<table>
<thead>
<tr>
<th>Product</th>
<th>1 or 2 Part</th>
<th>Color</th>
<th>Viscosity, cP</th>
<th>Density, g/cm³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conformal Coatings</td>
<td>Dow Corning® 3-1953 Conformal Coating</td>
<td>1 part</td>
<td>Translucent</td>
<td>350</td>
</tr>
<tr>
<td></td>
<td>Dow Corning® 3-1965 Conformal Coating</td>
<td>1 part</td>
<td>Translucent</td>
<td>115</td>
</tr>
<tr>
<td></td>
<td>Dow Corning® 1-2577 Low VOC Conformal Coating</td>
<td>1 part</td>
<td>Transparent</td>
<td>1,050</td>
</tr>
<tr>
<td></td>
<td>Dow Corning® LDC-2577D Dispersion Coating</td>
<td>1 part</td>
<td>Transparent</td>
<td>104</td>
</tr>
</tbody>
</table>

(1) Tack-free time is the time required for the product to develop a nontacky surface based on adhesion to a polyethylene film.

### CONTROL UNIT THERMAL MANAGEMENT

<table>
<thead>
<tr>
<th>Product</th>
<th>1 or 2 Part</th>
<th>Color</th>
<th>Thermal Conductivity, W/m.K</th>
<th>Thermal Resistance, °C/W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermally Conductive Encapsulant</td>
<td>Dow Corning® TC-6020 Thermally Conductive Encapsulant (1)†</td>
<td>2 part (1:1 mix ratio)</td>
<td>Gray</td>
<td>2.7</td>
</tr>
</tbody>
</table>

(1) Developmental product data.
<table>
<thead>
<tr>
<th>Lap Shear</th>
<th>Cure, time/.temp.</th>
<th>Viscosity, cP</th>
<th>Density, g/cm³</th>
<th>Durometer</th>
<th>CTE, ppm/K</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>24 hr/25°C</td>
<td>Part A: 2,900 Part B: 3,200 Mixed: 3,200</td>
<td>Cured: 1.58</td>
<td>45 (Shore A)</td>
<td></td>
<td>UL 94 V-0; UL RTI rating: 150°C</td>
</tr>
<tr>
<td>Al: 110 psi</td>
<td>60 min/120°C</td>
<td>Part A: 3,100 Part B: 2,500 Mixed: 2,900</td>
<td>Cured: 1.67</td>
<td>30 (Shore A)</td>
<td></td>
<td>UL flammability @ 1.5 mm: 94 V-0</td>
</tr>
<tr>
<td>Anodized Al: 220 psi</td>
<td>60 min/120°C</td>
<td>Part A: 1,600 Part B: 1,400 Mixed: 1,900</td>
<td>Cured: 1.67</td>
<td>60 (Shore A)</td>
<td></td>
<td>UL flammability @ 1.5 mm: 94 V-0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tack-Free Time[^1], time/temp.</th>
<th>Nonvolatile Content (NVC), %</th>
<th>Durometer</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 min/25°C 0.5 min/60°C (15% RH)</td>
<td>99.4</td>
<td>34 (Shore A)</td>
<td>UL 94 V-0; MIL-I-46056C Amend 7; IPC-CC-830B; UL 746E</td>
</tr>
<tr>
<td>6 min/25°C</td>
<td>-</td>
<td>33 (Shore A)</td>
<td>UL 94 V-0; MIL-I-46056C Amend 7; IPC-CC-830 with Amendment 1</td>
</tr>
<tr>
<td>6 min/25°C 1.5 min/60°C (15% RH)</td>
<td>NVC – forced draft volatility: 33.6</td>
<td>85 (Shore A) 25 (Shore D)</td>
<td>UL 94 V-0; MIL-I-46056C Amend 7; IPC-CC-830B; UL 746E</td>
</tr>
<tr>
<td>5 min/25°C 2 min/60°C (15% RH)</td>
<td>-</td>
<td>23 (Shore D)</td>
<td></td>
</tr>
</tbody>
</table>

[^1]: Dow Corning developmental material. The composition, features, benefits and other properties are subject to change. The future availability of this product is not guaranteed. You are responsible to determine the suitability of the Product for your contemplated use. The Product is provided “AS IS” WITH ALL FAULTS, AND WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.
**On-Board Charger**

**THERMAL MANAGEMENT**

<table>
<thead>
<tr>
<th>Product</th>
<th>1 or 2 Part</th>
<th>Color</th>
<th>Thermal Conductivity, W/m.K</th>
<th>Thermal Resistance, °C/W</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thermally Conductive Encapsulants</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Dow Corning® TC-4605 Thermally Conductive Encapsulant</em></td>
<td>2 part (1:1 mix ratio)</td>
<td>Gray</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td><em>Dow Corning® TC-4605 HLV Thermally Conductive Encapsulant</em></td>
<td>2 part (1:1 mix ratio)</td>
<td>Gray</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td><em>Dow Corning® TC-6020 Thermally Conductive Encapsulant</em>(1)</td>
<td>2 part (1:1 mix ratio)</td>
<td>Gray</td>
<td>2.7</td>
<td>-</td>
</tr>
</tbody>
</table>

(1) Developmental product data.

**ASSEMBLY**

<table>
<thead>
<tr>
<th>Product</th>
<th>1 or 2 Part</th>
<th>Color</th>
<th>Viscosity, cP</th>
<th>Density, g/cm³</th>
<th>Cure, time/temp.</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Dow Corning® EA-9189 H White RTV Adhesive</em></td>
<td>1 part</td>
<td>White</td>
<td>-</td>
<td>1.68</td>
<td>Room temperature cure when exposed to moisture in the air; tack-free time(2) @ 25°C: 2 min</td>
</tr>
</tbody>
</table>

(2) Tack-free time is the time required for the product to develop a nontacky surface based on adhesion to a polyethylene film.

**PROTECTION**

<table>
<thead>
<tr>
<th>Product</th>
<th>1 or 2 Part</th>
<th>Color</th>
<th>Viscosity, cP</th>
<th>Density, g/cm³</th>
<th>Cure, time/temp.</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Dow Corning® 3-1953 Conformal Coating</em></td>
<td>1 part</td>
<td>Translucent</td>
<td>350</td>
<td>0.98</td>
<td></td>
</tr>
<tr>
<td><em>Dow Corning® 3-1965 Conformal Coating</em></td>
<td>1 part</td>
<td>Translucent</td>
<td>115</td>
<td>0.99</td>
<td></td>
</tr>
<tr>
<td><em>Dow Corning® 1-2577 Low VOC Conformal Coating</em></td>
<td>1 part</td>
<td>Transparent</td>
<td>1,050</td>
<td>1.12</td>
<td></td>
</tr>
</tbody>
</table>

(2) Tack-free time is the time required for the product to develop a nontacky surface based on adhesion to a polyethylene film.
<table>
<thead>
<tr>
<th>Lap Shear</th>
<th>Cure, time/temp.</th>
<th>Viscosity, cP</th>
<th>Density, g/cm³</th>
<th>Durometer</th>
<th>CTE, ppm/K</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al: 110 psi</td>
<td>60 min/120°C Part A: 3,100 Part B: 2,500 Mixed: 2,900</td>
<td>Cured: 1.67</td>
<td>30 (Shore A)</td>
<td>-</td>
<td>UL flammability @ 1.5 mm: 94 V-0</td>
<td></td>
</tr>
<tr>
<td>Anodized Al: 220 psi</td>
<td>60 min/120°C Part A: 1,600 Part B: 1,400 Mixed: 1,900</td>
<td>Cured: 1.67</td>
<td>60 (Shore A)</td>
<td>-</td>
<td>UL flammability @ 1.5 mm: 94 V-0</td>
<td></td>
</tr>
<tr>
<td>Al: 0.5 psi</td>
<td>23 min/60°C, T90% 13 min/80°C, T90% 5 min/100°C, T90% Part A: 10,800 Part B: 9,960 Mixed: 10,640</td>
<td>2.926</td>
<td>63 (Shore A)</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

*Dow Corning developmental material. The composition, features, benefits and other properties are subject to change. The future availability of this product is not guaranteed. You are responsible to determine the suitability of the Product for your contemplated use. The Product is provided “AS IS” WITH ALL FAULTS, AND WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

<table>
<thead>
<tr>
<th>Lap Shear</th>
<th>Durometer</th>
<th>Tensile Strength, MPa</th>
<th>Elongation, %</th>
<th>CTE, ppm/°C</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al: 327 psi, 2.2 MPa, 225 N/cm² Cu: 343 psi, 2.3 MPa, 236 N/cm² PC: 187 psi, 1.2 MPa, 128 N/cm² FR4: 349 psi, 2.4 MPa, 240 N/cm²</td>
<td>80 (Shore A)</td>
<td>3.9</td>
<td>32</td>
<td>-</td>
<td>Thermal conductivity: 0.88 W/m.K UL 94 V-0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tack-Free Time, time/temp.</th>
<th>Nonvolatile Content (NVC), %</th>
<th>Durometer</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 min/25°C 0.5 min/60°C (15% RH)</td>
<td>99.4</td>
<td>34 (Shore A)</td>
<td>UL 94 V-0; MIL-I-46058C Amend 7; IPC-CC-830B; UL 746E</td>
</tr>
<tr>
<td>6 min/25°C</td>
<td>-</td>
<td>33 (Shore A)</td>
<td>UL 94 V-0; MIL-I-46058C Amend 7; IPC-CC-830 with Amendment 1</td>
</tr>
<tr>
<td>6 min/25°C 1.5 min/60°C (15% RH) NVC – forced draft volatility: 33.6</td>
<td>85 (Shore A) 25 (Shore D)</td>
<td>UL 94 V-0; MIL-I-46058C Amend 7 IPC-CC-830B; UL 746E</td>
<td></td>
</tr>
</tbody>
</table>
## PTC Heater
### THERMAL MANAGEMENT AND ASSEMBLY

<table>
<thead>
<tr>
<th>Product</th>
<th>1 or 2 Part</th>
<th>Color</th>
<th>Thermal Conductivity, W/m.K</th>
<th>Thermal Resistance, °C/W</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Dow Corning® Q1-9226 Thermally Conductive Adhesive</em></td>
<td>2 part</td>
<td>Gray</td>
<td>0.8</td>
<td>-</td>
</tr>
<tr>
<td><em>Dow Corning® SE 4402 Thermally Conductive Adhesive</em></td>
<td>1 part</td>
<td>Gray</td>
<td>0.9</td>
<td>-</td>
</tr>
<tr>
<td><em>Dow Corning® TC-2035 Thermally Conductive Adhesive</em></td>
<td>2 part</td>
<td>Part A: White</td>
<td>3.3</td>
<td>0.25 @ 50 μm 0.44 @ 100 μm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Part B: Reddish brown</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Electric Compressor
### PROTECTION

<table>
<thead>
<tr>
<th>Product</th>
<th>1 or 2 Part</th>
<th>Color</th>
<th>Viscosity, cP</th>
<th>Density, g/cm³</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Dow Corning® 3-1953 Conformal Coating</em></td>
<td>1 part</td>
<td>Translucent</td>
<td>350</td>
<td>Cured: 0.98</td>
</tr>
<tr>
<td><em>Dow Corning® 3-1965 Conformal Coating</em></td>
<td>1 part</td>
<td>Translucent</td>
<td>115</td>
<td>Cured: 0.99</td>
</tr>
<tr>
<td><em>Dow Corning® 1-2577 Low VOC Conformal Coating</em></td>
<td>1 part</td>
<td>Transparent</td>
<td>1,050</td>
<td>Cured: 1.12</td>
</tr>
</tbody>
</table>

*Tack-free time is the time required for the product to develop a nontacky surface based on adhesion to a polyethylene film.*

## Sheath Heater
### PROTECTION

<table>
<thead>
<tr>
<th>Product</th>
<th>1 or 2 Part</th>
<th>Color</th>
<th>Viscosity, cP</th>
<th>Density, g/cm³</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Part B: 1.110</td>
<td>Part B, Uncured: 1.37</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mixed: 2.135</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Part B: 1.287</td>
<td>Part B, Uncured: 1.38</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mixed: 2.361</td>
<td></td>
</tr>
<tr>
<td>Lap Shear</td>
<td>Cure, time/temp.</td>
<td>Viscosity, cP</td>
<td>Density, g/cm³</td>
<td>Durometer</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------------</td>
<td>--------------</td>
<td>---------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Al: 375 psi, 2.6 MPa, 260 N/cm²</td>
<td>Heat cure (100°C or above)</td>
<td>Part A: 48,000 Part B: 43,000 Mixed: 59,000</td>
<td>Cured: 2.14</td>
<td>67 (Shore A)</td>
</tr>
<tr>
<td>Al: 530 psi, 3.65 MPa, 365 N/cm²</td>
<td>30 min/150°C</td>
<td>32,000</td>
<td>Cured: 2.2</td>
<td>75 (Shore A)</td>
</tr>
<tr>
<td>Al: 381 psi, 2.63 MPa, 263 N/cm² Cu: 416 psi, 2.87 MPa, 287 N/cm²</td>
<td>30 min/125°C 10 min/150°C</td>
<td>Part A: 130,000 Part B: 118,000 Mixed: 125,000</td>
<td>Wet: 3</td>
<td>95 (Shore A [JIS Type A]) 45 (Shore D)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tack-Free Time, time/temp.</th>
<th>Nonvolatile Content (NVC), %</th>
<th>Durometer</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 min/25°C 0.5 min/60°C (15% RH)</td>
<td>99.4</td>
<td>34 (Shore A)</td>
<td>UL 94 V-0; MIL I-46058C Amend 7; IPC-CC-830B; UL 746E</td>
</tr>
<tr>
<td>6 min/25°C</td>
<td>-</td>
<td>33 (Shore A)</td>
<td>UL 94 V-0; MIL I-46058C Amend 7; IPC-CC-830 with Amendment 1</td>
</tr>
<tr>
<td>6 min/25°C 1.5 min/60°C (15% RH)</td>
<td>NVC – forced draft volatility: 33.6</td>
<td>85 (Shore A) 25 (Shore D)</td>
<td>UL 94 V-0; MIL I-46058C Amend 7; IPC-CC-830B; UL 746E</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cure, time/temp.</th>
<th>Durometer</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 hr/25°C 25 min/70°C 10 min/100°C</td>
<td>47 (Shore A)</td>
<td>Thermal conductivity: 0.48 W/m.K</td>
</tr>
<tr>
<td>0.2 hr/25°C</td>
<td>41 (Shore A)</td>
<td>Thermal conductivity: 0.4 W/m.K</td>
</tr>
</tbody>
</table>
IMAGINE

The Value of Materials
Innovation, Expertise and Support from Dow Corning

Established specifically to explore and develop the potential of silicones, Dow Corning Corporation has grown to be a global leader in silicones, silicon-based technology and innovation. We bring you:

• More than 65 years of success in game-changing materials innovation for the world’s transportation industry

• Specific expertise in the development of performance-enhancing and enabling technologies for automotive electronics

• Decades of experience in the development and application of silicone-based thermal management materials

To help make electric vehicles a high-performing, cost-effective transportation alternative, Dow Corning is investing in new solutions for the design and assembly of xEV electronics. And we are looking for opportunities to collaborate with battery cell makers, system designers, assemblers, tier suppliers and vehicle OEMs to improve the efficiency and reliability of next-generation battery packs and systems.

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