

# Silicone materials for EV charging infrastructure

Product selection guide





## Challenges and opportunities for EV charging infrastructure

Earth-friendly lifestyle choices coupled with a desire to save fuel costs are driving demand for electric vehicles (EVs) dramatically. Added to the larger ongoing mobility electrification trends, this is creating a critical need for expanded infrastructure – especially for charging stations and related equipment required to support the mass adoption of EV technology. Electric vehicle charging needs to become more convenient, more efficient and more sustainable.

In addition to meeting the demand for many more residential and commercial charging stations, manufacturers must address a number of challenges, including charging speed, safety, compatibility, dependability and efficiency – as well as preparing for emerging trends toward integration with smart grid technology and wireless charging.

At Dow, we engineer innovative silicone materials that play a crucial role in enabling opportunities in charging infrastructure to help address these needs.

## Why choose silicone technology from Dow?

Dow is committed to offering innovative technologies to original equipment manufacturers (OEMs) and automotive electronics suppliers to help enable smarter, more sustainable transportation upgrades. Especially in this period of rapid development of EV charging infrastructure, Dow is focusing on exploring the potential of the industry, relying on trusted application experience and critical insights in materials science to create a series of innovative and high-performance silicone options for battery packs, charging stations, charging guns, energy storage systems and other applications.

The inherent versatility of silicone chemistry can help expand design freedom, increase processing options, and enhance performance and reliability. Dow offers a wide range of product options to address specific challenges in EV infrastructure, including:

- Thermal management materials, including gap fillers, adhesives, noncuring compounds, gels and encapsulants
- Protection and assembly materials, including adhesives, sealants and conformal coatings
- Elastomers, high-consistency silicone rubbers (HCR) and liquid silicone rubbers (LSR)



## Applications

EV charging systems essentially can be classified into two categories: AC (residential slow charging) and DC (public/commercial fast charging).

Dow offers a range of material options specially tailored to the more demanding needs of the high-power fast-charging DC infrastructure, including technologies for charging stations, charging guns (connectors), cables and housings.

Comprehensive use of thermally conductive engineering materials, silicone elastomers, coolants and other silicone technologies can significantly enhance the functionality, safety and sustainability of EV charging infrastructures and bring an efficient, reliable driving experience to consumers.



## Silicone thermal management materials

Heat generation is inherent in the charging process, resulting in thermal management challenges for charging housings, charging guns, and wires and cables. With the evolution of heat-dissipation technology in charging modules, heat can be transferred via high-conductivity materials to the external environment. Alternatively, more complex liquid-cooling technology can resolve the problem of heat dissipation within the charging housing itself. Either method requires appropriate thermal conductivity and thermal management materials.

## Silicone protection and assembly materials

Interiors of printed circuit board (PCB) modules, charging gun connectors and charging housing cabinets contain components such as capacitors, semiconductors and magnetic devices, which all are sensitive to environmental contamination (e.g., ingress of dust, water, salt spray, etc.). These interiors also contain power devices with high heat output. Silicone materials can help maintain these structures so components can be protected from the environment.



# Materials for EV charging infrastructure

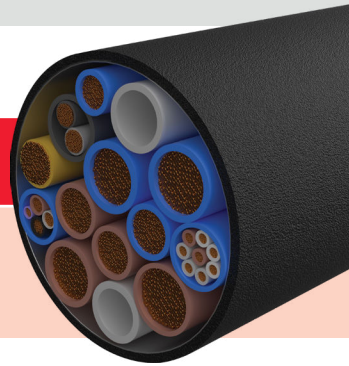
## Charging guns

- Gels, encapsulants and pottants
- Thermal management
- Cooling fluids
- HCR
- LSR
- Conformal coatings
- Sealants/adhesives



## Charging cables and busbars

- HCR
- Cooling fluids



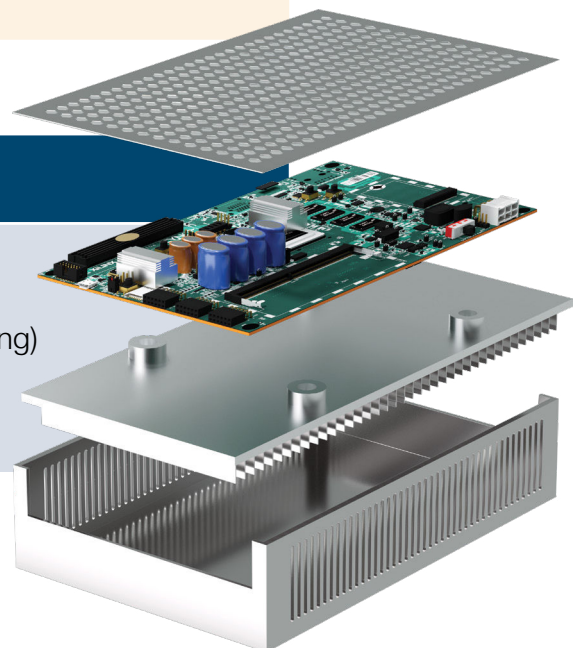
## Charging station housings

- Foam gaskets
- Sealant/adhesives



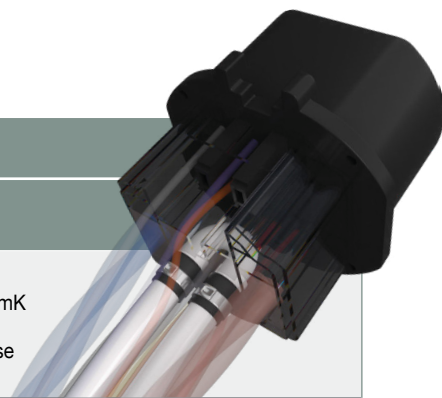
## Power electronics

- Ceramifying HCR
- Conformal coatings
- Electrically conductive materials (EMI shielding)
- Thermal management materials
- Gels, encapsulants and pottants



## Charging gun applications

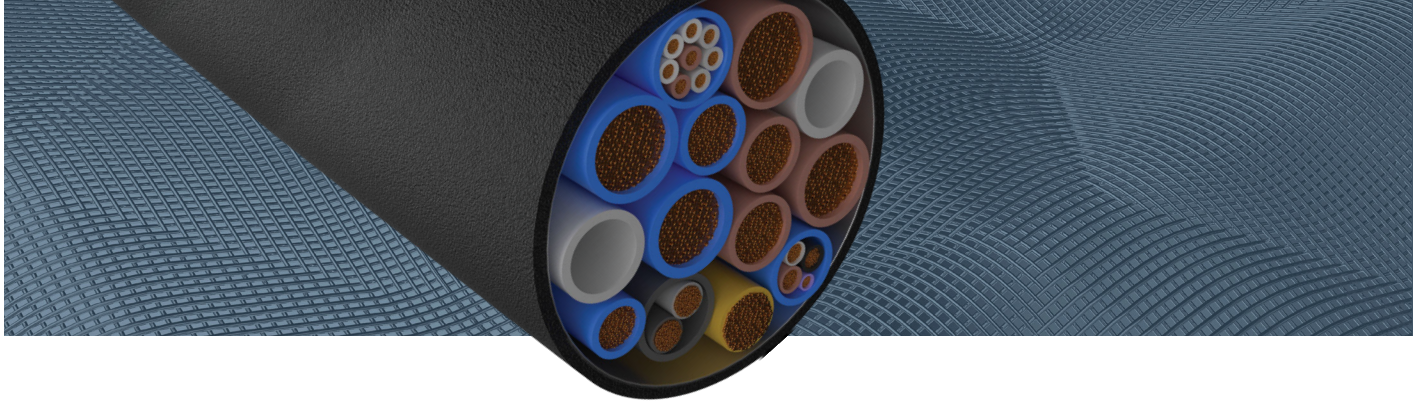
| Thermal management materials |                  |                                                  |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------|------------------|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Application area             | Type             | Product                                          | Description                                                                                                                                                                                                                                                                                             | Characteristics                                                                                                                                                                                                                                                                                                                                                                                                     |
| Coolant tubes                | HCR              | SILASTIC™ HTE 5015-90U                           | Designed to offer high thermal conductivity that enables transfer and release of heat generated from high-current charging gun cables                                                                                                                                                                   | <ul style="list-style-type: none"> <li>• 90 Shore A</li> <li>• High thermal conductivity: 1.5 W/mK</li> <li>• High flexibility</li> <li>• Coolant resistance for longtime use</li> <li>• Extrudable molding</li> </ul>                                                                                                                                                                                              |
| Cooling fluid                | Fluid            | XIAMETER™ PMX-200 Silicone Fluid                 | Low-viscosity heat transfer fluid offering efficient, reliable thermal transfer for active cooling applications in direct contact with active electrical parts; offers high dielectric properties, a broad range of chemical compatibility and stable physical properties over a wide temperature range | <ul style="list-style-type: none"> <li>• 10 cSt silicone fluid (PDMS)</li> <li>• Stable properties over wide range of temperatures (-40 to 200°C)</li> <li>• Excellent dielectric properties</li> <li>• Wide range of chemical compatibility</li> <li>• Low fire hazard and reactivity; flash point &gt;135°C to comply with IEC TS 62196-3-1 requirements</li> <li>• Good and stable thermal properties</li> </ul> |
| Gun head                     | Sealant/adhesive | DOWSIL™ 7091 Adhesive Sealant                    | Designed for applications that demand a strong but flexible bond, such as when bonding materials with differing thermal expansion rates (e.g., glass to metal or glass to plastic); can be used as a formed-in-place gasket (FIPG) or in-place gasket (IPG)                                             | <ul style="list-style-type: none"> <li>• 1-part, neutral room-temperature cure adhesive/sealant</li> <li>• Cures to a tough, flexible rubber</li> <li>• Excellent adhesion to many substrates</li> <li>• Stable and flexible from -40 to 180°C (-40 to 356°F)</li> <li>• UL-94 V-1</li> </ul>                                                                                                                       |
|                              |                  | DOWSIL™ EA-3838 Fast Adhesive                    | Developed to offer durable adhesive bonding and sealing for components that exhibit different thermal expansion rates and/or where fast homogeneous cure throughout the adhesive cross-section and early adhesion development are needed                                                                | <ul style="list-style-type: none"> <li>• 2-part, noncorrosive, neutral alkoxy-cure adhesive/sealant</li> <li>• Good, durable adhesion to wide variety of substrates</li> <li>• Variable 2:1 to 4:1 volumetric mixing ratio</li> <li>• UL-94 V-1</li> </ul>                                                                                                                                                          |
| Gun head protection          | HCR              | SILASTIC™ SH 502U A/B                            | Designed for applications that demand flame resistance in compliance with UL-94 V-0                                                                                                                                                                                                                     | <ul style="list-style-type: none"> <li>• 55 Shore A</li> <li>• Good flame retardancy</li> <li>• Serviceable over wide temperature range</li> <li>• Pigmentable</li> <li>• UL-94 V-0</li> </ul>                                                                                                                                                                                                                      |
|                              |                  | SILASTIC™ SH 1447U A                             | Designed for applications that demand flame resistance in compliance with UL-94 V-0                                                                                                                                                                                                                     | <ul style="list-style-type: none"> <li>• 70 Shore A</li> <li>• Good flame retardancy</li> <li>• Serviceable over wide temperature range</li> <li>• Pigmentable</li> <li>• UL-94 V-0</li> </ul>                                                                                                                                                                                                                      |
| Charging port – inside       | Encapsulant      | DOWSIL™ TC-6015 Thermally Conductive Encapsulant | Designed especially for use in the manufacture of electrical and PCB products and modules; excellent choice for control units, inverters and power modules                                                                                                                                              | <ul style="list-style-type: none"> <li>• 2-part, 1:1 encapsulant</li> <li>• Thermal conductivity: 1.6 W/mK</li> <li>• Room-temperature curable with accelerated heat option</li> <li>• Self-adhesion</li> <li>• UL-94 V-0; RTI 150°C</li> </ul>                                                                                                                                                                     |
| Charging port – outside      | Potant           | SYLGARD™ 567 Primerless Silicone Encapsulant     | Designed for potting high-power devices, automotive assemblies, LED drivers, industrial controls and sensors; successfully demonstrated encapsulant for a broad range of applications                                                                                                                   | <ul style="list-style-type: none"> <li>• 2-part, 1:1 heat-cure encapsulant</li> <li>• Self-priming; no additional priming step required</li> <li>• UL-94 V-0</li> </ul>                                                                                                                                                                                                                                             |
|                              |                  | SYLGARD™ 160 Silicone Elastomer                  | Designed for potting connectors, sensors, high-power devices, automotive assemblies, LED drivers, industrial controls and transformers; successfully demonstrated encapsulant for a broad range of applications                                                                                         | <ul style="list-style-type: none"> <li>• 2-part, 1:1 encapsulant</li> <li>• Room-temperature or heat-accelerated cure</li> <li>• Moderate thermal conductivity: 0.62 W/mK</li> <li>• UL-94 V-0</li> </ul>                                                                                                                                                                                                           |
|                              |                  | DOWSIL™ EE-3200 Low Stress Encapsulant           | Designed for excellent flame resistance and protection against water ingress to improve safety and reliability under harsh outdoor environments such as junction boxes, power conversion devices (inverters, converters), and automotive and railway PCB modules                                        | <ul style="list-style-type: none"> <li>• 2-part, 1:1 encapsulant</li> <li>• Room-temperature or accelerated heat cure</li> <li>• Moderate thermal conductivity: 0.5 W/mK</li> <li>• UL-94 V-0</li> </ul>                                                                                                                                                                                                            |



## Charging gun applications *(continued)*

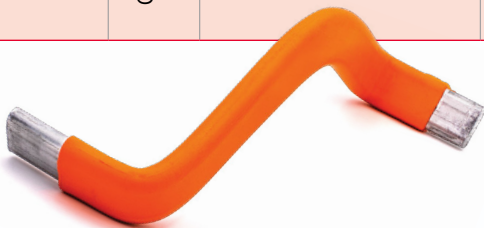
| Thermal management materials <i>(continued)</i> |                   |                                                    |                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                    |
|-------------------------------------------------|-------------------|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Application area                                | Type              | Product                                            | Description                                                                                                                                                                                          | Characteristics                                                                                                                                                                                                                                                                                                    |
| Handle                                          | Gap filler        | DOWSIL™ TC-4551 CV Thermally Conductive Gap Filler | Designed to dissipate heat from PCBA module assemblies mounted to heat sink; offers a reliable option for modules and control units                                                                  | <ul style="list-style-type: none"> <li>• 2-part, 1:1 gap filler</li> <li>• Room-temperature or heat-accelerated cure</li> <li>• Thermal conductivity: 5.2 W/mK</li> <li>• Long-term performance stability during temperature cycling up to 150°C</li> <li>• UL-94 V-0</li> </ul>                                   |
|                                                 |                   | DOWSIL™ TC-5351 Thermally Conductive Compound      | Designed to maintain a positive heat sink seal to improve heat transfer from the PCBA; suitable for use as a thermally conductive material in power applications                                     | <ul style="list-style-type: none"> <li>• 1-part, noncuring compound</li> <li>• Thermal conductivity: 3.3 W/mK</li> <li>• Vertical gap-fill capability up to 1.0 mm</li> <li>• UL-94 V-0</li> </ul>                                                                                                                 |
| Connector                                       | HCR               | SILASTIC™ DY32-464U                                | Designed for connector and weatherpack seals with self-lubricating functionality                                                                                                                     | <ul style="list-style-type: none"> <li>• 30 Shore A</li> <li>• Oil bleeding</li> <li>• Good oil resistance</li> <li>• Good demolding</li> <li>• 5% oil content</li> <li>• Serviceable over wide temperature range</li> <li>• Pigmentable</li> </ul>                                                                |
|                                                 |                   | SILASTIC™ DY32-366U                                | Designed for connector and weatherpack seals with self-lubricating functionality                                                                                                                     | <ul style="list-style-type: none"> <li>• 40 Shore A</li> <li>• Oil bleeding</li> <li>• Good oil resistance</li> <li>• Good demolding</li> <li>• 5% oil content</li> <li>• Serviceable over wide temperature range</li> <li>• Pigmentable</li> </ul>                                                                |
|                                                 |                   | SILASTIC™ DY32-502U                                | Designed for connector and weatherpack seals with self-lubricating functionality                                                                                                                     | <ul style="list-style-type: none"> <li>• 50 Shore A</li> <li>• Oil bleeding</li> <li>• Good oil resistance</li> <li>• Good demolding</li> <li>• 5% oil content</li> <li>• Serviceable over wide temperature range</li> <li>• Pigmentable</li> <li>• UL-94 HB</li> </ul>                                            |
|                                                 | LSR               | SILASTIC™ 920x-yy series LSR                       | Designed for connector and weatherpack seals with self-lubricating functionality and low compression set                                                                                             | <ul style="list-style-type: none"> <li>• Multiple hardness and oil content available</li> <li>• Oil bleeding</li> <li>• Low compression set</li> <li>• Low viscosity</li> <li>• Unique rheology</li> <li>• Opaque</li> </ul>                                                                                       |
| Silicone protection and assembly materials      |                   |                                                    |                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                    |
|                                                 | Conformal coating | DOWSIL™ 3-1953 Conformal Coating                   | Suitable as a coating for rigid and flexible circuit boards, connector pin sealing, sensitive components, and fine-pitched designs for automotive industries requiring various reliability standards | <ul style="list-style-type: none"> <li>• 1-part, alkoxy room-temperature-cure conformal coating</li> <li>• Solventless elastomeric formulation</li> <li>• MIL-I-46058C Amend 7/IPC-CC-830</li> <li>• UL-94 V-0</li> </ul>                                                                                          |
|                                                 |                   | DOWSIL™ 1-2577 Conformal Coating                   | Abrasion-resistant elastoplastic conformal coating available in standard and low-VOC versions                                                                                                        | <ul style="list-style-type: none"> <li>• 1-part, solventborne, room-temperature-cure conformal coating</li> <li>• Cures to a tough, elastoplastic, resilient, abrasion-resistant surface</li> <li>• IPC-CC-830, Amendment 1 approved</li> <li>• MIL-I-46058C, Amendment 7 approved</li> <li>• UL 94 V-0</li> </ul> |
|                                                 |                   | DOWSIL™ 3-1944 RTV Coating                         | Designed for use as a coating or adhesive with added UV indicator, good flowability and fast tack-free time                                                                                          | <ul style="list-style-type: none"> <li>• 1-part, alkoxy room-temperature-cure coating</li> <li>• Able to flow, fill or self-level after dispensing</li> <li>• MIL-I-46058C Amend 7/IPC-CC-830</li> <li>• UL-94 V-0</li> </ul>                                                                                      |





## Charging cable and busbar applications

| Thermal management materials |                 |                                  |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------|-----------------|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Application area             | Type            | Product                          | Description                                                                                                                                                                                                                                                                                             | Characteristics                                                                                                                                                                                                                                                                                                                                                                                                     |
| Coolant tubes                | HCR             | SILASTIC™ HTE 5015-90U           | Designed to offer high thermal conductivity that enables transfer and release of heat generated from high-current charging gun cables                                                                                                                                                                   | <ul style="list-style-type: none"> <li>• 90 Shore A</li> <li>• High thermal conductivity: 1.5 W/mK</li> <li>• High flexibility</li> <li>• Coolant resistance for longtime use</li> <li>• Extrudable molding</li> </ul>                                                                                                                                                                                              |
| Cooling fluid                | Fluid           | XIAMETER™ PMX-200 Silicone Fluid | Low-viscosity heat transfer fluid offering efficient, reliable thermal transfer for active cooling applications in direct contact with active electrical parts; offers high dielectric properties, a broad range of chemical compatibility and stable physical properties over a wide temperature range | <ul style="list-style-type: none"> <li>• 10 cSt silicone fluid (PDMS)</li> <li>• Stable properties over wide range of temperatures (-40 to 200°C)</li> <li>• Excellent dielectric properties</li> <li>• Wide range of chemical compatibility</li> <li>• Low fire hazard and reactivity; flash point &gt;135°C to comply with IEC TS 62196-3-1 requirements</li> <li>• Good and stable thermal properties</li> </ul> |
| Charging cable insulation    | HCR             | SILASTIC™ HCE 70-8942U           | Designed for high-voltage cable insulation with excellent thermal resistance (-40 to 180°C), mechanical properties and high flexibility                                                                                                                                                                 | <ul style="list-style-type: none"> <li>• 70 Shore A</li> <li>• ISO 6722 Class E Certified</li> <li>• Extrudable molding</li> <li>• High tear strength</li> <li>• High-consistency silicone rubber U-stock</li> </ul>                                                                                                                                                                                                |
|                              |                 | SILASTIC™ HCE 70-8540U           | Designed for high-voltage cable insulation with excellent thermal resistance (-40 to 180°C), mechanical properties and high flexibility                                                                                                                                                                 | <ul style="list-style-type: none"> <li>• 70 Shore A</li> <li>• Extrudable molding</li> <li>• High tear strength</li> <li>• High-consistency silicone rubber U-stock</li> </ul>                                                                                                                                                                                                                                      |
|                              |                 | SILASTIC™ DY32-6151U             | Designed for high-voltage cable insulation with excellent thermal resistance (-40 to 200°C), mechanical properties and high flexibility                                                                                                                                                                 | <ul style="list-style-type: none"> <li>• 61 Shore A</li> <li>• ISO 6722 Class F</li> <li>• Extrudable molding</li> <li>• High-consistency silicone rubber U-stock</li> </ul>                                                                                                                                                                                                                                        |
| Busbar                       | Ceramifying HCR | SILASTIC™ HCx 67-1352 EV FR ORG  | Designed for busbar coating with excellent flame resistance; forms ceramifiable layer; extrudable or injection-, transfer- or compression-moldable                                                                                                                                                      | <ul style="list-style-type: none"> <li>• 65 Shore A</li> <li>• Improved fabrication performance</li> <li>• Flame resistance</li> <li>• Forms ceramifiable layer</li> <li>• Color: RAL 2003</li> </ul>                                                                                                                                                                                                               |



## Charging stations/housing applications

| Thermal management materials               |                  |                                       |                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------|------------------|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Application area                           | Type             | Product                               | Description                                                                                                                                                                                                                                                                                                                                                                    | Characteristics                                                                                                                                                                                                                                                                                                                                                               |
| Shell                                      | Sealant/adhesive | DOWSIL™<br>CN3180<br>RTV Adhesive     | Designed as a protective coating for rigid or flexible PCBAs; adhesive and sealant for electronics devices                                                                                                                                                                                                                                                                     | <ul style="list-style-type: none"><li>• 1-part, room-temperature-cure adhesive/sealant</li><li>• Solventless; VOC-free</li><li>• Good adhesion to most substrates</li></ul>                                                                                                                                                                                                   |
|                                            |                  | DOWSIL™<br>7091<br>Adhesive Sealant   | Designed for applications that demand a strong but flexible bond, such as when bonding materials with differing thermal expansion rates (e.g., glass to metal or glass to plastic); can be used as a formed-in-place gasket (FIPG) or in-place gasket (IPG)                                                                                                                    | <ul style="list-style-type: none"><li>• 1-part, neutral room-temperature cure adhesive/sealant</li><li>• Cures to a tough, flexible rubber</li><li>• Excellent adhesion to many substrates</li><li>• Stable and flexible from 40 to 180°C (-40 to 356°F)</li><li>• UL-94 V-1</li></ul>                                                                                        |
|                                            |                  | DOWSIL™<br>SE 9168<br>RTV Adhesive    | Designed for applications that need adhesion, component staking or vibration damping                                                                                                                                                                                                                                                                                           | <ul style="list-style-type: none"><li>• 1-part, neutral room-temperature-cure adhesive/sealant</li><li>• Nonflowing</li><li>• Controlled silicone volatility</li><li>• UL-94 V-0</li></ul>                                                                                                                                                                                    |
|                                            |                  | DOWSIL™<br>EA-4700 CV<br>Adhesive     | Offers critical adhesion and sealing performance in a variety of applications, including electronic control units; sensor modules; or battery pack applications for lid seal, gasketing or connector sealing                                                                                                                                                                   | <ul style="list-style-type: none"><li>• 2-part, 1:1 room-temperature-cure adhesive</li><li>• Durable adhesion to typical substrates used in automotive electronics (e.g., aluminum, PBT, PPS)</li><li>• Controlled silicone volatility</li><li>• Stable performance under typical operational environment (150°C, thermal shock and 85°C/85% RH)</li><li>• UL-94 HB</li></ul> |
|                                            |                  | DOWSIL™<br>EA-3838<br>Fast Adhesive   | Developed to offer durable adhesive bonding and sealing for components that exhibit different thermal expansion rates and/or where fast homogeneous cure throughout the adhesive cross-section and early adhesion development are needed; can be used for various automotive and automotive electronics assembly applications where a flexible, strong adhesive bond is needed | <ul style="list-style-type: none"><li>• 2-part, noncorrosive, neutral alkoxy-cure adhesive/sealant</li><li>• Good, durable adhesion to wide variety of substrates</li><li>• Variable 2:1 to 4:1 volumetric mixing ratio</li><li>• UL-94 V-1</li></ul>                                                                                                                         |
| Silicone protection and assembly materials |                  |                                       |                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                               |
| Charging housing cabinets                  | Sealant/adhesive | DOWSIL™<br>7091<br>Adhesive Sealant   | Silicone adhesives offer durable bonding, sealing and gaskets for charging pile cabinet doors to improve safe, reliable performance of charging piles                                                                                                                                                                                                                          | <ul style="list-style-type: none"><li>• 1-part, neutral room-temperature cure adhesive/sealant</li><li>• Cures to a tough, flexible rubber</li><li>• Excellent adhesion to many substrates</li><li>• Stable and flexible from 40 to 180°C (-40 to 356°F)</li><li>• UL-94 V-1</li></ul>                                                                                        |
|                                            | Foam gasket      | DOWSIL™<br>3-8259 RF<br>Silicone Foam | Silicone foam offers rapid room-temperature curing, crevice-filling, vibration-buffering, and excellent heat and flame protection                                                                                                                                                                                                                                              | <ul style="list-style-type: none"><li>• Medium hardness (Shore 00)</li><li>• Reduced flow</li><li>• 1:1 mix ratio</li><li>• Fast room temperature cure</li><li>• Low compression set</li><li>• Stable and flexible over a wide temperature range</li></ul>                                                                                                                    |



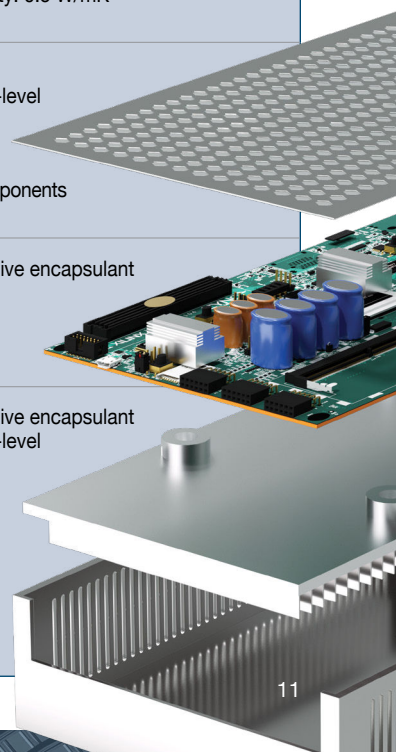


## Power electronics applications

| Thermal management materials |            |                                                               |                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------|------------|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Application area             | Type       | Product                                                       | Description                                                                                                                                                                                                                          | Characteristics                                                                                                                                                                                                                                                                                                                                   |
| IGBT/inverters               |            |                                                               |                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                   |
| IGBT/<br>MOSFET              | Compound   | DOWSIL™<br>TC-5351<br>Thermally<br>Conductive<br>Compound     | Designed to maintain a positive heat sink seal to improve heat transfer from the PCBA; suitable for use as a thermally conductive material in power applications                                                                     | <ul style="list-style-type: none"> <li>• 1-part, noncuring compound</li> <li>• Thermal conductivity: 3.3 W/mK</li> <li>• Vertical gap-fill capability up to 1.0 mm</li> <li>• UL-94 V-0</li> </ul>                                                                                                                                                |
|                              |            | DOWSIL™<br>TC-5628<br>Thermal<br>Compound                     | Features properties such as low thermal resistance and high thermal conductivity; can achieve thin bond line thicknesses (BLTs), which can help improve transfer of heat away from the device                                        | <ul style="list-style-type: none"> <li>• 1-part, noncuring compound</li> <li>• Excellent thermal conductivity: 4.0 W/mK</li> <li>• Low thermal resistance</li> </ul>                                                                                                                                                                              |
|                              |            | DOWSIL™<br>TC-5550<br>Thermally<br>Conductive<br>Compound     | Designed to offer efficient thermal transfer for the cooling of electronic modules and good pump-out resistance, especially in bare die application                                                                                  | <ul style="list-style-type: none"> <li>• 1-part, noncuring compound</li> <li>• High thermal conductivity: 5.0 W/mK</li> <li>• Achieves thin bond line thickness (BLT)</li> <li>• Low thermal resistance</li> </ul>                                                                                                                                |
|                              | Gap filler | DOWSIL™<br>TC-4060<br>Thermally<br>Conductive Gel             | Designed for a smooth assembly process line integration ideally suited for automated dispensing with meter mix equipment                                                                                                             | <ul style="list-style-type: none"> <li>• 2-part, 1:1 room-temperature-cure thermal gel</li> <li>• Thermal conductivity: 6 W/mK silicone gel</li> <li>• Long-term performance stability during temperature cycling up to 150°C</li> <li>• Glass beads option (250 micron)</li> </ul>                                                               |
|                              |            | DOWSIL™<br>TC-4525CV<br>Thermally<br>Conductive Gap<br>Filler | Cured material is soft and compressible; designed to dissipate the heat from electronics mounted on printed circuit board to heat sink, offering a reliable cooling option for modules such as engines or transmission control units | <ul style="list-style-type: none"> <li>• Thermal conductivity: &gt;2.5 W/mK</li> <li>• Room-temperature cure</li> <li>• Long-term performance stability during temperature cycling up to 150°C</li> <li>• Low compression stress</li> <li>• Holds vertical position (cured or uncured state)</li> <li>• Controlled silicone volatility</li> </ul> |
|                              |            | DOWSIL™<br>TC-5150<br>Thermally<br>Conductive Gap<br>Filler   | The compounds are designed to maintain a positive heat sink seal to improve heat transfer from PCBA to heat sink or chassis, thereby increasing the overall efficiency of the device                                                 | <ul style="list-style-type: none"> <li>• 1-part, noncuring gap filler</li> <li>• High thermal conductivity: 5 W/mK</li> <li>• Low thermal impedance</li> </ul>                                                                                                                                                                                    |
|                              | Gel        | SYLGARD™<br>527<br>Silicone<br>Dielectric Gel                 | Suitable for sealing and protecting various PCB system assemblies, especially those with delicate components                                                                                                                         | <ul style="list-style-type: none"> <li>• 2-part, 1:1 room-temperature-cure soft gel</li> <li>• Heat cure for increased processing speeds</li> <li>• Low viscosity allows good flow under components</li> <li>• UL-94 HB</li> </ul>                                                                                                                |
|                              |            | DOWSIL™<br>EG-3810<br>Dielectric Gel                          | Designed for potting and protecting of PCB system assemblies, especially power semiconductor modules to protect dies and interconnects from environmental conditions and to offer dielectric insulation                              | <ul style="list-style-type: none"> <li>• 1-part, clear, low-/high-temperature gel</li> <li>• Heat cure</li> <li>• Suitable for operating temperatures ranging from -60 to 200°C</li> <li>• No mixing required</li> </ul>                                                                                                                          |
|                              |            | DOWSIL™<br>EG-3896<br>Dielectric Gel                          | Designed for potting and protecting of PCB system assemblies, especially power semiconductor modules to protect dies and interconnects from environmental conditions and to offer dielectric insulation                              | <ul style="list-style-type: none"> <li>• 2-part, 1:1 fast heat-cure toughened gel</li> <li>• Suitable for operating temperatures ranging from -60 to 185°C</li> <li>• Improved resistance to crack formation</li> <li>• Excellent flowability</li> <li>• UL-94 V-1</li> </ul>                                                                     |

## Power electronics applications *(continued)*

| Thermal management materials <i>(continued)</i> |                                  |                                                   |                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------|----------------------------------|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Application area                                | Type                             | Product                                           | Description                                                                                                                                                                                                                                                      | Characteristics                                                                                                                                                                                                                                                                                                                                                                                   |
| IGBT/inverters <i>(continued)</i>               |                                  |                                                   |                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                   |
| Inverters                                       | Gap filler                       | DOWSIL™ TC-4515 Thermal Gap Filler                | Designed for a smooth assembly process line integration ideally suited for automated dispensing with meter mix equipment                                                                                                                                         | <ul style="list-style-type: none"> <li>2-part 1:1 thermal gap filler</li> <li>Room-temperature or heat-accelerated cure</li> <li>Thermal conductivity: &gt;1.8 W/mK</li> <li>Long-term performance stability during temperature cycling up to 150°C</li> <li>UL-94 V-0</li> </ul>                                                                                                                 |
|                                                 |                                  | DOWSIL™ TC-4525CV Thermally Conductive Gap Filler | Cured material is soft and compressible; designed to dissipate the heat from electronics mounted on printed circuit board to heat sink, offering a reliable cooling option for modules such as engines or transmission control units                             | <ul style="list-style-type: none"> <li>Thermal conductivity: &gt;2.5 W/mK</li> <li>Room-temperature cure</li> <li>Long-term performance stability during temperature cycling up to 150°C</li> <li>Low compression stress</li> <li>Holds vertical position (cured or uncured state)</li> <li>Controlled silicone volatility</li> </ul>                                                             |
|                                                 |                                  | DOWSIL™ TC-4060 Thermally Conductive Gel          | Designed for a smooth assembly process line integration ideally suited for automated dispensing with meter mix equipment                                                                                                                                         | <ul style="list-style-type: none"> <li>2-part, 1:1 thermal gel</li> <li>Room-temperature cure with optional heat acceleration</li> <li>6 W/mK silicone gel</li> <li>Long-term performance stability during temperature cycling up to 150°C</li> </ul>                                                                                                                                             |
|                                                 | Potting                          | DOWSIL™ 3-4207 Dielectric Tough Gel               | Toughened gel for applications requiring soft encapsulating material; added strength and conditional primerless adhesion to isolate PCBAs from the harmful effects of moisture and other contaminants                                                            | <ul style="list-style-type: none"> <li>2-part, 1:1 fast room-temperature-cure tough gel</li> <li>Conditional primerless adhesion at room temperature</li> <li>Toughened gel for additional mechanical strength</li> <li>UL 94 V-1</li> </ul>                                                                                                                                                      |
|                                                 |                                  | DOWSIL™ 3-4150 Dielectric Gel                     | Suitable for sealing and protecting various PCB system assemblies, especially those with delicate components                                                                                                                                                     | <ul style="list-style-type: none"> <li>2-part, 1:1 soft gel</li> <li>Parts are blue and yellow and turn green when mixed</li> <li>Fast room-temperature cure; no ovens required</li> </ul>                                                                                                                                                                                                        |
|                                                 |                                  | DOWSIL™ EE-3200 Low Stress Encapsulant            | Designed for excellent flame resistance and protection against water ingress to improve safety and reliability under harsh outdoor environments such as junction boxes, power conversion devices (inverters, converters), and automotive and railway PCB modules | <ul style="list-style-type: none"> <li>2-part, 1:1 encapsulant</li> <li>Soft; low durometer</li> <li>Low internal stress during thermal cycling</li> <li>Good flowability/low viscosity; highly flowable for filling small gaps and fast processing</li> <li>Room-temperature or accelerated heat cure</li> <li>Moderate thermal conductivity: 0.5 W/mK</li> <li>Good heat dissipation</li> </ul> |
|                                                 | Thermally conductive encapsulant | DOWSIL™ TC-6010 Thermally Conductive Encapsulant  | Designed for heat dissipation and affixing components for onboard charger and inverter/ converter                                                                                                                                                                | <ul style="list-style-type: none"> <li>2-part material</li> <li>Flowable; able to fill and self-level after dispensing</li> <li>Versatile heat cure</li> <li>Thermally conductive; heat dissipation from sensitive components</li> <li>UL-94 V-0</li> </ul>                                                                                                                                       |
|                                                 |                                  | DOWSIL™ TC-6020 Thermally Conductive Encapsulant  | Suitable for automotive control unit, offering protection from harsh environmental conditions and thermal management                                                                                                                                             | <ul style="list-style-type: none"> <li>2-part, 1:1 thermally conductive encapsulant</li> <li>Heat cure</li> <li>Adhesion to aluminum (Al)</li> <li>High thermal conductivity: 2.7 W/mK</li> </ul>                                                                                                                                                                                                 |
|                                                 |                                  | DOWSIL™ TC-6032 Thermally Conductive Encapsulant  | Delivers high thermal conductivity, controlled volatility and reliable performance in automotive power applications                                                                                                                                              | <ul style="list-style-type: none"> <li>2-part, 1:1 thermally conductive encapsulant</li> <li>Flowable; able to fill and self-level after dispensing</li> <li>Versatile heat cure</li> <li>Thermally conductive: 3.2 W/mK</li> <li>Heat dissipation from sensitive components</li> <li>Low volatile content (D4-D10): &lt;100 ppm (0.01%)</li> <li>UL-94 V-0</li> </ul>                            |



## Power electronics applications *(continued)*

### Thermal management materials *(continued)*

| Application area | Type              | Product                                                              | Description                                                                                                                                                                  | Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------|-------------------|----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Control units    |                   |                                                                      |                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Control box      | EMI               | DOWSIL™ EC-8425 Electrically Conductive Adhesive                     | Designed as an electrically conductive adhesive with strong adhesion and stable conductivity for electromagnetic compatibility (EMC) and electrical connections              | <ul style="list-style-type: none"> <li>• 1-part adhesive</li> <li>• Nonflowable electrically conductive adhesive</li> <li>• Strong electromagnetic shielding across wide range of frequencies</li> <li>• Fast heat-cure capabilities starting from 90°C</li> <li>• Strong, reliable adhesion on variety of substrates</li> <li>• &gt;20% elongation for stress-relief characteristic</li> <li>• UV traceability for ease of inspection</li> </ul> |
| PCB              | Conformal coating | DOWSIL™ 3-1953 Conformal Coating                                     | Suitable for automotive industries requiring various reliability standards as a coating for rigid and flexible circuit boards, sensitive components and fine-pitched designs | <ul style="list-style-type: none"> <li>• 1-part, alkoxy room-temperature-cure conformal coating</li> <li>• Solventless elastomeric formulation</li> <li>• MIL-I-46058C Amend 7/IPC-CC-830</li> <li>• UL-94 V-0</li> </ul>                                                                                                                                                                                                                         |
|                  |                   | DOWSIL™ 3-1944 RTV Coating                                           | Designed for use as a coating or adhesive with added UV indicator; good flowability; fast tack-free time                                                                     | <ul style="list-style-type: none"> <li>• 1-part, alkoxy room-temperature-cure coating</li> <li>• Able to flow, fill or self-level after dispensing</li> <li>• MIL-I-46058C Amend 7/IPC-CC-830</li> <li>• UL-94 V-0</li> </ul>                                                                                                                                                                                                                     |
|                  |                   | DOWSIL™ 1-4105 Conformal Coating                                     | Suitable for use as a protective coating for rigid and flexible circuit boards                                                                                               | <ul style="list-style-type: none"> <li>• 1-part, heat-cure conformal coating</li> <li>• No added solvents</li> <li>• UL-94 V-1</li> </ul>                                                                                                                                                                                                                                                                                                         |
|                  |                   | DOWSIL™ CC-8030 UV and Moisture Dual Cure Conformal Coating          | UV and moisture dual-cure conformal coating suitable for use as a protective coating for rigid circuit boards                                                                | <ul style="list-style-type: none"> <li>• 1-part UV and moisture dual cure</li> <li>• No added solvents</li> <li>• Fast primary UV cure</li> <li>• Secondary moisture cure for shadowed areas</li> <li>• UL-94 V-0</li> </ul>                                                                                                                                                                                                                      |
|                  |                   | DOWSIL™ CC-8033 UV and Moisture Dual Cure Conformal Coating Adhesive | UV and moisture dual-cure conformal coating suitable for use as a protective coating for rigid circuit boards or for damming and staking applications                        | <ul style="list-style-type: none"> <li>• 1-part UV and moisture dual-cure</li> <li>• No added solvents</li> <li>• Fast primary UV cure</li> <li>• Secondary moisture cure for shadowed areas</li> <li>• UL-94 pending</li> </ul>                                                                                                                                                                                                                  |
|                  |                   | DOWSIL™ 1-2577 Conformal Coating                                     | Abrasion-resistant elastoplastic conformal coating available in standard and low-VOC versions                                                                                | <ul style="list-style-type: none"> <li>• 1-part, solventborne, room-temperature-cure conformal coating</li> <li>• Cures to a tough, elastoplastic, resilient, abrasion-resistant surface</li> <li>• IPC-CC-830, Amendment 1 approved</li> <li>• MIL-I-46058C, Amendment 7 approved</li> <li>• UL 94 V-0</li> </ul>                                                                                                                                |



## Put Dow MobilityScience™ to work for you

Dow recognizes the dramatic transformation underway in the transportation industry. Digital technologies and the pressing need for low-carbon mobility have disrupted traditional value chains and present a new frontier for material science and innovation – where lighter weight, longer range, greater comfort, enhanced safety and a lower carbon footprint are the ultimate objectives.

Flexibility, innovation and – above all – collaboration are essential for success during this historic revolution. That is where Dow science, know-how, and people step in, working closely with customers to create the materials that bring possibilities to life.





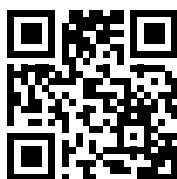
# How can we help you today?

A broad selection of demonstrated-effective DOWSIL™ brand, SILASTIC™ brand, SYLGARD™ brand and XIAMETER™ brand silicone materials is available to fulfill the demanding performance requirements for charging systems being used in a diverse range of applications. Dow can help enable innovative design and processing options for the consumer and automotive electronics industries. Tell us about your performance, design and manufacturing challenges. Let us put our silicone-based materials, our application knowledge and our processing experience to work for you.

## Learn more

We offer more than just a trusted portfolio of advanced silicone-based materials. As your dedicated innovation leader, we bring process and application experience, a network of technical specialists, a reliable global supply base, and world-class customer service.

To find out how we can support your EV charging infrastructure applications, visit [dow.com/emobility](https://dow.com/emobility).



Images: Cover – dow\_54812022396, dow\_4191138918; Page 2 – dow\_81681874156, dow\_70290905810; Page 3 – dow\_7577284684, dow\_81681876908, dow\_81681877646; Page 4 – dow\_81681879244; Page 5 – dow\_81767893484, dow\_80941539996, dow\_81767892358, dow\_81767891165; Page 6 – dow\_80941533499; Page 7 – dow\_81767893484; Page 8 – dow\_80612215690, dow\_54812022396; Page 9 – dow\_81767892358; Page 13 – dow\_81767893878, dow\_54812022396; Page 14 – dow\_81681878726

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

NOTICE: No freedom from infringement of any patent owned by Dow or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change with time, Customer is responsible for determining whether products and the information in this document are appropriate for Customer's use and for ensuring that Customer's workplace and disposal practices are in compliance with applicable laws and other government enactments. The product shown in this literature may not be available for sale and/or available in all geographies where Dow is represented. The claims made may not have been approved for use in all countries. Dow assumes no obligation or liability for the information in this document. References to "Dow" or the "Company" mean the Dow legal entity selling the products to Customer unless otherwise expressly noted. NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.

®™ Trademark of The Dow Chemical Company ("Dow") or an affiliated company of Dow.

© 2023-2024 The Dow Chemical Company. All rights reserved.

#17397

Form No. 80-8636-01-0224 AGP