Innovative Material Solutions for Communications and Consumer Electronics

IMAGINE
More performance, reliability and style.
Less compromise.
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ABOUT THIS GUIDE
Product recommendations in this guide are based on test results and successful applications under certain conditions. Due to the many variable influences, we cannot guarantee a positive result with our products in every case. Performance and compatibility tests should be carried out prior to final use. For specific application needs, contact your Dow Corning representative.

Specification writers: Values presented in this guide are not intended for use in preparing specifications. Please contact your local Dow Corning sales office or your Global Dow Corning Connection before writing specifications on these products.
In just two decades, communications and consumer electronics have rapidly evolved from devices that fit on the desktop to the backpack to the back pocket. That evolution is only accelerating with each new generation of sleek, wearable devices that integrate seamlessly with our ever more productive and connected lifestyles. These emerging devices present new challenges for designers – over and above the challenges they already face in other applications, from displays to data servers to intelligent kitchen appliances.

Dow Corning, a wholly owned subsidiary of The Dow Chemical Company, offers proven material solutions in bonding, sealing, thermal management and other applications where we can help address challenges across the industry’s supply chain. Furthermore, many of our electronics-grade materials have been UL recognized. Contact us today to learn how we can help you optimize the reliability, protection, safety and aesthetics of your next generation of communications and consumer devices.

DOW CORNING CORPORATION FAST FACTS*

- 7,000 products and services
- 25,000 customers worldwide
- 11,000 employees worldwide
- 60 offices and manufacturing locations worldwide
- 3-4 percent investment of sales into R&D
- 3,059 active patents worldwide

*Approximate numbers as of Dec. 31, 2015
Innovative Solutions for Consumer, Computer and Telecommunications Electronics


We rely on our electronics to help us be more productive, smarter and increasingly connected to each other as well as to the Internet of Things (IoT). So, we expect these products – from smartwatches to tablets to dishwashers – to be more functional, user-friendly, stylish and dependable.

For more than 70 years, Dow Corning’s versatile materials and expert collaboration have helped designers of consumer, computing and telecommunications electronics bridge the gap between cutting-edge innovation and proven performance.

In addition to simplifying manufacturing and assembly, our versatile silicone adhesives, encapsulants and coatings protect against moisture, vibration and shock to enable more reliable, high-functioning portable electronics and computers and more durable home appliances. Thermal interface materials from Dow Corning deliver further protection against damaging heat to enhance reliability for these products, as well as even higher-performing telecommunications components.

Our silicone-based solutions can help make device designs look and feel as smart on the outside as they are on the inside. Our easy-to-apply functional surface coatings enable easy-to-clean touch-screen displays, while our colorable TPSiV® thermoplastic elastomer materials deliver tough yet silky options for wearable electronics that demand proven performance for safe contact with skin.

As an established global leader in silicone materials and expertise, Dow Corning delivers reliable and consistent supply and support along the entire value chain and for its electronics customers worldwide.

Contact us to learn how we can help your next design raise the standard for consumer electronics, computing and telecommunication electronics.
**Applications:**
Display module assembly bonding, home key bonding, earphone and speaker bonding

**Product:**
*Dow Corning®* EA-4600 Hot Melt Adhesive

**Benefits:**
- Instant green strength (high initial strength instantly after joining the parts)
- Good reworkability
- Primerless bonding to glass, plastics and metals
- Long open time and pot life
- Allows for precision micro-banding
- Provides environmental sealing, such as waterproofing – IP67 ingress protection

**Application:**
Electronic device accessories (earbuds, etc.)

**Product:**
*TPSiV®* thermoplastic elastomer materials

**Benefits:**
- Soft touch and comfort
- UV and chemical resistance
- Proven skin safety
- Bonding to ABS and polycarbonate (PC), colorability, over-molding capability

**Application:**
Durable and easy-to-clean cover glass coating

**Product:**
*Dow Corning®* 2634 Coating

**Benefits:**
- Excellent oil and water repellency
- Durable surface and reduced-staining properties
- Easy-to-clean surface

**Application:**
Printed circuit board (PCB) protection coating

**Products:**
*Dow Corning®* 1-2577 Conformal Coating
*Dow Corning®* 3-1953 Conformal Coating
*Dow Corning®* 3-1965 Conformal Coating

**Benefits:**
- Ease of application by spraying, dipping or brushing
- Room temperature cure or can be accelerated with mild heat
- Reworkability
- Stable and flexible at high temperature
- Protection from environmental particulates, moisture (corrosion) and contaminants
- Stress buffer with insulation resistance
**Application:** Waterproof and dustproof sealing

**Product:** Dow Corning® EA-4600 Hot Melt Adhesive

**Benefits:**
- Allows for precision micro-beading
- Instant green strength (high initial strength instantly after joining the parts)
- Good reworkability
- Primerless bonding to glass, plastics and metals
- Long open time and pot life
- Provides environmental sealing, such as waterproofing – IP67 ingress protection

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**Product:** Dow Corning® SE-9100 Black Adhesive

**Benefits:**
- More flowable than Dow Corning® EA-4600 Hot Melt Adhesive
- Fast tack-free (fast surface drying)
- Good reworkability
- Primerless bonding to glass, plastics and metals
- Long open time and pot life
- Provides environmental sealing, such as waterproofing – IP68 ingress protection

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**Application:** Power connector potting

**Products:**
- Dow Corning® 3-6876 Adhesive
- Dow Corning® Q3-6611 Adhesive

**Benefits:**
- Good flowing, filling or self-leveling after dispensing
- Good adhesion to metals by one-part heat cure
- Waterproof and dustproof sealing
- Stress buffer against shock and drop test
- High heat stability against reflow process

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**Application:** Phone bumper

**Product:** TPSiV® thermoplastic elastomer materials

**Benefits:**
- Soft, silky touch
- Excellent sealing
- Excellent colorability
- Superior UV resistance and chemical resistance; outstanding durability
- Proven skin safety
- Bonding to plastic substrates such as PC, ABS; over-molding capability

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**Application:** Panel gap sealing

**Products:**
- Dow Corning® SE-9100 Black Adhesive (reworkable)
- Dow Corning® SE 9186 Clear or White Adhesive

**Benefits:**
- Room temperature cure; no mixing or oven required
- Good flowing, filling or self-leveling after dispensing
- Stress buffer against shock and drop test

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**Application:** Speaker module bonding and sealing (sound leakage prevention)

**Products:**
- Dow Corning® SE-9100 Black Adhesive
- Dow Corning® EA-4600 Hot Melt Adhesive

**Benefits:**
- Reworkability
- Sound leakage prevention
- No mixing or oven required

**Product:** Dow Corning® SE 9186 Clear or White Adhesive

**Benefits:**
- Sound leakage prevention
- Excellent adhesion on plastics (PC housing)
- Excellent reliability performance

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**Application:** Mobile phone vibration motor damping (potting)

**Product:** Dow Corning® SE 9186 Clear or White Adhesive

**Benefits:**
- Room temperature cure; no ovens required
- Good flowing, filling or self-leveling after dispensing
- Stress buffer against shock and drop test
- Excellent adhesion on plastics (PC housing)
- Excellent reliability performance
**Application:**
Thermal management of central processing unit (CPU)

**Products:**
- *Dow Corning*® TC-5121C Thermally Conductive Compound
- *Dow Corning*® TC-5622 Thermally Conductive Compound
- *Dow Corning*® TC-5026 Thermally Conductive Compound
- *Dow Corning*® TC-5022 Thermally Conductive Compound

**Benefits:**
- Noncurable (paste type); no oven required for curing
- Easy control of thin bond line thickness (BLT) for optimum performance
- Very low thermal resistivity
- Excellent wettability

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**Application:**
Thermal management for heat sink module

**Products:**
- *Dow Corning*® 1-4173 Thermally Conductive Adhesive
- *Dow Corning*® SE 4450 Thermally Conductive Adhesive

**Benefits:**
- No mixing required
- Versatile cure processing controlled by temperature
- Able to flow, fill or self-level after dispensing

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**Application:**
PCB protection coating

**Products:**
- *Dow Corning*® 1-2577 Conformal Coating
- *Dow Corning*® 3-1953 Conformal Coating
- *Dow Corning*® 3-1965 Conformal Coating

**Benefits:**
- Ease of application by spraying, dipping or brushing
- Room temperature cure or can be accelerated with mild heat
- Protection from environmental particulates, moisture (corrosion) and contaminants
- Stress buffer with insulation resistance
- Repairable
- Stable and flexible at high temperature
Application:
Durable and easy-to-clean cover glass coating

Product:
Dow Corning® 2634 Coating

Benefits:
• Fingerprint reduction
• Easy to clean
• Oil and water repellency
• Less staining from contaminants

Application:
Laptop structural bonding

Product:
Dow Corning® EA-4600 Hot Melt Adhesive

Benefits:
• Instant green strength (high initial strength instantly after joining the parts)
• Good reworkability
• Primerless bonding to glass, plastics and metals
• Long open time and pot life
• Allows for precision micro-beading
• Can provide environmental sealing, such as waterproofing
Displays

Application:
ITO protection for mid-size display (tablet PC)

Products:
- Dow Corning® SE 9187 L Adhesive
- Dow Corning® EA-3000 RTV Black or White
- Dow Corning® EA-2000 Silicone Adhesive

Benefits:
• Fast tack-free (fast surface drying)
• Low viscosity (flowable for narrow gap or low thickness)
• Noncorrosive cure (alcohol type)
• Excellent primerless adhesion to many substrates
• Low volatility

Application:
ITO protection for small-size display (smartphone)

Products:
- Dow Corning® EA-3342 Terminal Sealant
- Dow Corning® EA-3342HV Terminal Sealant
- Dow Corning® EA-3342LV Terminal Sealant

Benefits:
• Low viscosity with controlled flowability
• Ultrathin film achievable for electrode and IC protection
• Partially reworkable

Application:
Bezel-less TV/monitor frame bonding

Products:
- Dow Corning® SE 9186 Clear or White Adhesive
- Dow Corning® SE 9186 L Silicone Adhesive Clear
- Dow Corning® EA-4600 Hot Melt Adhesive

Benefits:
• Room temperature cure; no ovens required
• Good flowing, filling or self-leveling after dispensing

1Dow Corning® EA-3342LV Terminal Sealant cannot be shipped by air.
**Application:**
Bezel-less TV/monitor frame sealing

**Product:**
*Dow Corning® SE 9001L Black Adhesive*

**Benefits:**
- Good dispensability
- Good gap filling after dispensing
- Good visual appearance to the naked eye
- Improves module reliability

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**Application:**
Part fixing

**Products:**
- *Dow Corning® SE 9186 Clear or White Adhesive*
- *Dow Corning® SE 9186 L Silicone Adhesive Clear*
- *Dow Corning® EA-4600 Hot Melt Adhesive*

**Benefits:**
- Room temperature cure; no ovens required
- Good adhesion to many substrates

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**Application:**
Gap filler

**Products:**
- *Dow Corning® SE 9189 L Gray or White RTV Adhesive*
- *Dow Corning® SE 9186L Coating*

**Benefits:**
- Good flowability/wetting
- Adequate adhesion to many substrates
- Good appearance after cure
- Tack-free time (fast surface drying): 5-8 minutes

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**Application:**
Light diffuser for backlight module

**Product:**
*Dow Corning Toray EP-2720 Powder*

**Benefit:**
- Provides good balance of transmittance and haze as well as diffusion effect
**Application:**
Thermal management for amplifier models

**Products:**
- Dow Corning® TC-5121C Thermally Conductive Compound
- Dow Corning® TC-5021 Thermally Conductive Compound

**Benefits:**
- Low thermal resistance
- High thermal conductivity
- Thin bond line thickness (BLT)

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**Application:**
Thermal management for PCBs

**Products:**
- Dow Corning® 3-6652 Thermally Conductive Elastomer
- Dow Corning® TC-4025 Dispensable Thermal Pad
- Dow Corning® TC-4015 Dispensable Thermal Pad

**Benefits:**
- Low thermal resistance
- High thermal conductivity
- Conform to variable level components

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**Application:**
Protection for outdoor power units

**Products:**
- Dow Corning® 1-2577 Conformal Coating
- Dow Corning® 3140 RTV Coating

**Benefits:**
- High reliability
- Good adhesion
- Stable in harsh environments
- Very low stress to components
**Application:**
Thermal management for servers (power units)

**Products:**
- Dow Corning® TC-5622 Thermally Conductive Compound
- Dow Corning® TC-5026 Thermally Conductive Compound

**Benefits:**
- Low thermal resistance
- High thermal conductivity
- Thin bond line thickness (BLT)
- Excellent wettability

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**Application:**
Thermal management for MOS-SET

**Product:**
Dow Corning® 1-4173 Thermally Conductive Adhesive

**Benefits:**
- Low thermal resistance
- High thermal conductivity
- High bonding strength
Home Appliances

Application: Washing machine control unit PCB protection

Products:
- Dow Corning® 1-2577 Low VOC Conformal Coating
- Dow Corning® 3-1953 Conformal Coating
- Dow Corning® 3-1965 Conformal Coating

Benefits:
- Excellent dielectric performance
- Ease of application by spraying, dipping or brushing
- Protection from environmental particulates, moisture (corrosion) and contaminants
- Stress buffer with insulation resistance
- Room temperature cure or can be accelerated with mild heat
- Good adhesion to many substrates
- Repairable
- Stable and flexible at high temperature

Application: Air conditioner PCB protection

Product: Dow Corning® SE 9187 L Adhesive

Benefits:
- Room temperature cure with optional heat acceleration after solvent flash-off
- UV indicator allows for automated inspection
- Offers some post-cure abrasion resistance
**Application:** Various frequency motor thermal bonding

**Product:** Dow Corning® TC-1500 Thermally Conductive Adhesive

**Benefits:**
- Short tack-free time
- High thermal conductivity
- Easy to use without mixing
- Room temperature cure without heating

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**Application:** Home appliance housing/surface cover

**Product:** TPSiV® 4000 Series thermoplastic elastomer materials

**Benefits:**
- Soft and silky-touch feel with slip prevention
- Colorful and matte look
- Excellent UV resistance
- Outstanding scratch resistance
Wearable & Portable Devices

TPSiV® in wearable devices

Application:
Wristbands, watchbands, earbuds, other wearable smart devices

Product:
TPSiV® thermoplastic elastomer materials

Benefits:
• Unique silky, soft touch
• Excellent colorability and UV stability
• Proven skin safety
• Excellent bonding to polycarbonate, ABS and similar polar substrates
**TPSiV® in portable devices, appliances & accessories**

**Application:**
Enclosure parts and protective covers for portable devices, appliances and accessories to enable aesthetics and hand feel (e.g., smartphones, tablets, laptops, speakers, computer mice, home appliances, robotics)

**Product:**
TPSiV® thermoplastic elastomer materials

**Benefits:**
- Unique silky, soft touch
- Excellent colorability
- Matte, patterned or glossy finish
- Superior durability
- Proven skin safety
- Excellent bonding to polycarbonate, ABS and similar polar substrates

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**TPSiV® in harsh environments**

**Application:**
Water-resistant sealing on portable devices

**Product:**
TPSiV® thermoplastic elastomer materials

**Benefits:**
- Superior compression set and mechanical properties to provide excellent sealing
- Excellent bonding to polycarbonate, ABS and similar polar substrates
### Adhesives/Sealants

#### Category One part; moisture cure RTV

<table>
<thead>
<tr>
<th>Product name</th>
<th>Features</th>
<th>Mixing ratio</th>
<th>Appearance</th>
<th>Physical Properties After Cure</th>
<th>Adhesion Properties After Cure</th>
<th>Electrical Properties After Cure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dow Corning® 3140 RTV Coating</strong></td>
<td>Reworkable; fast tack-free</td>
<td>NA</td>
<td>Clear to slightly hazy; smooth, viscous liquid</td>
<td>Density @ 25°C, g/cm³</td>
<td>Lap shear adhesion, N/cm²</td>
<td>Dielectric constant @ 1 kHz, kV/mm</td>
</tr>
<tr>
<td><strong>Dow Corning® 3145 RTV MIL-A-46146 Adhesive</strong></td>
<td>Noncorrosive; fast tack-free</td>
<td>NA</td>
<td>Translucent/gray</td>
<td>Durometer – JIS Type A</td>
<td>–</td>
<td>Volume resistivity, Ω•cm</td>
</tr>
<tr>
<td><strong>Dow Corning® SE 9100 Black Adhesive</strong></td>
<td>Noncorrosive; fast tack-free</td>
<td>NA</td>
<td>Black</td>
<td>Tensile strength, MPa</td>
<td>–</td>
<td>Dielectric constant @ 1 MHz, kV/mm</td>
</tr>
<tr>
<td><strong>Dow Corning® SE 9120 Clear Sealant</strong></td>
<td>Noncorrosive; fast tack-free</td>
<td>NA</td>
<td>Translucent, white</td>
<td>Elongation, %</td>
<td>–</td>
<td>Dielectric tangent @ 1 MHz, kV/mm</td>
</tr>
<tr>
<td><strong>Dow Corning® SE 9186 Clear or White Adhesive</strong></td>
<td>Noncorrosive; fast tack-free</td>
<td>NA</td>
<td>Translucent, black</td>
<td>Linear coefficient of thermal expansion, micrometer/°C or ppm</td>
<td>–</td>
<td>Dielectric tangent @ 1 kHz, kV/mm</td>
</tr>
<tr>
<td><strong>Dow Corning® SE 9186 Silicone Adhesive Clear</strong></td>
<td>Noncorrosive; fast tack-free</td>
<td>NA</td>
<td>Black</td>
<td>Thermal conductivity, W/m•K</td>
<td>–</td>
<td>Dielectric tangent @ 1 kHz, kV/mm</td>
</tr>
<tr>
<td><strong>Dow Corning® EA-3342 Terminal Sealant</strong></td>
<td>Noncorrosive; fast tack-free</td>
<td>NA</td>
<td>Blue</td>
<td>Low-molecular-weight siloxane content, %</td>
<td>–</td>
<td>Dielectric tangent @ 1 MHz, kV/mm</td>
</tr>
<tr>
<td><strong>Dow Corning® EA-3342HV Terminal Sealant</strong></td>
<td>Noncorrosive; fast tack-free</td>
<td>NA</td>
<td>Black</td>
<td>–</td>
<td>–</td>
<td>Dielectric tangent @ 1 kHz, kV/mm</td>
</tr>
<tr>
<td><strong>Dow Corning® EA-3342LV Terminal Sealant</strong></td>
<td>Noncorrosive; fast tack-free</td>
<td>NA</td>
<td>Black</td>
<td>–</td>
<td>–</td>
<td>Dielectric tangent @ 1 kHz, kV/mm</td>
</tr>
</tbody>
</table>

#### Features
- MIL-A-46146; noncorrosive
- Noncorrosive; fast tack-free
- Control flowability; reworkable within one day
- Terminal sealing for ITO protection in small-size displays

#### Potential uses
- Rigid and flexible circuit boards; improved pin/solder joint coverage
- Sealing openings in modules and housings; assembly of components on PWB
- Assembly of mobile modules and display modules; coating of hybrid ICs and PCBs; encapsulation of electrical devices
- LCD modules
- Parts fixing on printed circuit boards
- Sealing of electronic equipment and modules
- Terminal sealing for ITO protection in small-size displays

#### Mixing ratio
- NA

#### Appearance
- Clear to slightly hazy; smooth, viscous liquid
- Translucent/gray
- Black
- Translucent, white
- Translucent, black
- Black
- Blue
- Black

#### Viscosity @ 25°C, mPa•S
- 31,000
- Nonflowing
- 50,000
- 8,000
- 64,000
- 27,000
- 700
- 750
- 370

#### Tack-free time @ 25°C, min
- 70
- 55
- 9
- 8
- 8
- 8
- 8
- 10

#### Pot life @ 25°C, hr
- NA
- NA
- NA
- NA
- NA
- NA
- NA
- NA

#### Room temperature cure time
- 72 hr @ 25°C/50% RH(1)
- 48 hr @ 25°C/50% RH(1)
- 24 hr @ 25°C/50% RH(1)
- 24 hr @ 25°C/50% RH(1)
- 24 hr @ 25°C/50% RH(1)
- 24 hr @ 25°C/50% RH(1)
- 24 hr @ 25°C/50% RH(1)
- 24 hr @ 25°C/50% RH(1)

#### Physical Properties After Cure
- Density @ 25°C, g/cm³
- 1.03
- 1.10
- 1.02
- 1.03
- 1.03
- 1.02
- 1.12 (cured)
- 1.12 (cured)
- 1.13 (cured)
- Durometer – JIS Type A
- 31 (Shore A)
- 45 (Shore A)
- 23
- 24
- 20
- 25
- –
- –
- –
- Tensile strength, MPa
- 3.0
- 6.5
- 2.31
- 1.5
- 2.5
- 1.6
- 7.4
- 7.1
- 6.9
- Elongation, %
- 419
- 660
- 391
- 375/400
- 550
- 400
- 400
- 490
- 477
- Linear coefficient of thermal expansion, micrometer/°C or ppm
- 315
- 370
- 308
- –
- –
- –
- –
- –
- –
- Thermal conductivity, W/m•K
- –
- –
- –
- –
- –
- –
- –
- –
- –
- Low-molecular-weight siloxane content, %
- –
- –
- 0.006/0.004
- 0.0055/0.004
- 0.0035/0.0045
- 0.0023/0.0029
- –
- –

#### Adhesion Properties After Cure
- Lap shear adhesion, N/cm²
- –
- –
- 30-40/GL
- 29-40/GL
- 130/GL
- 92/GL

#### Electrical Properties After Cure
- Dielectric strength, kV/mm
- 18
- 20
- 23
- 23
- 23
- 23
- 26
- 34
- 28.6
- Volume resistivity, Ω•cm
- 2E+14
- 4E+14
- 9E+15
- 7E+15
- 6E+15
- 6E+15
- 5E+15
- 1E+15
- 3E+15
- Dielectric constant @ 1 MHz
- 2.52 @ 100 kHz
- 2.83 @ 100 kHz
- 4.01
- 2.7
- 2.7
- 2.7
- 2.18 @ 100 kHz
- 2.1 @ 100 kHz
- 2.81 @ 100 kHz
- Dielectric tangent @ 1 MHz
- 1E-03 @ 1 kHz
- <2E-04 @ 1 kHz
- 1E-03
- 4E-04
- 1E-03
- 1E-03
- –
- –

1) 3 mm thickness.
2) NA = Not applicable (not measured due to inappropriate test method).
3) – = Not available.
<table>
<thead>
<tr>
<th>Category</th>
<th>One part; moisture cure RTV</th>
<th>One part; heat cure</th>
<th>Two part; addition reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product name</td>
<td>Dow Corning® SE 9168 RTV Adhesive</td>
<td>Dow Corning® SE 9189 L Gray or White RTV Adhesive</td>
<td>Dow Corning® SE 1714 Beige or Black</td>
</tr>
<tr>
<td>Features</td>
<td>Noncorrosive; fast tack-free</td>
<td>Noncorrosive; fast tack-free</td>
<td>High tensile strength; high adhesion strength</td>
</tr>
<tr>
<td>Flame retardance</td>
<td>UL94 V-0</td>
<td>UL94 V-0</td>
<td>Flowable; heat cure; high tensile strength</td>
</tr>
<tr>
<td>Low molecular weight of siloxane control grade</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Potential uses</td>
<td>Parts fixing on printed circuit boards</td>
<td>Parts fixing on printed circuit boards of power supplies and CRT, LCD/LED/PDP</td>
<td>ECU; power modules</td>
</tr>
<tr>
<td>Mixing ratio</td>
<td>NA</td>
<td>24 hr @ 25°C/50% RH</td>
<td>0.5 hr @ 150°C</td>
</tr>
<tr>
<td>Appearance</td>
<td>Gray</td>
<td>White, gray</td>
<td>Beige, black</td>
</tr>
<tr>
<td>Viscosity @ 25°C, mPa•S</td>
<td>Nonflowing 12,000, 22,000 Paste</td>
<td>Paste Paste Paste</td>
<td>59,000 92,400 39,900</td>
</tr>
<tr>
<td>Tack-free time @ 25°C, min</td>
<td>6.5</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Pot life @ 25°C, hr</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Cure time</td>
<td>–</td>
<td>24 hr @ 25°C/50% RH</td>
<td>0.5 hr @ 150°C</td>
</tr>
</tbody>
</table>

### Physical Properties After Cure

<table>
<thead>
<tr>
<th>Property</th>
<th>Dow Corning® SE 9168 RTV Adhesive</th>
<th>Dow Corning® SE 9189 L Gray or White RTV Adhesive</th>
<th>Dow Corning® SE 1714 Beige or Black</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density @ 25°C, g/cm³</td>
<td>1.32</td>
<td>1.19</td>
<td>1.30</td>
</tr>
<tr>
<td>Durometer – JIS Type A</td>
<td>44</td>
<td>33</td>
<td>60</td>
</tr>
<tr>
<td>Tensile strength, MPa</td>
<td>3.69</td>
<td>2</td>
<td>3.7</td>
</tr>
<tr>
<td>Elongation, %</td>
<td>363</td>
<td>–</td>
<td>3.71</td>
</tr>
<tr>
<td>Linear coefficient of thermal expansion, micron/m°C or ppm</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Thermal conductivity, W/m•K</td>
<td>–</td>
<td>0.88</td>
<td>–</td>
</tr>
<tr>
<td>Low-molecular-weight siloxane content, %</td>
<td>0.0035</td>
<td>0.0035/0.004</td>
<td>&lt;0.003</td>
</tr>
</tbody>
</table>

### Adhesion Properties After Cure

<table>
<thead>
<tr>
<th>Lap shear adhesion, N/cm²</th>
<th>Dow Corning® SE 9168 RTV Adhesive</th>
<th>Dow Corning® SE 9189 L Gray or White RTV Adhesive</th>
<th>Dow Corning® SE 1714 Beige or Black</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dielectric strength, kV/mm</td>
<td>26</td>
<td>28</td>
<td>25</td>
</tr>
<tr>
<td>Volume resistivity, Ω•cm</td>
<td>8E+15</td>
<td>1E+15</td>
<td>5E+15</td>
</tr>
<tr>
<td>Dielectric constant @ 1 MHz</td>
<td>3.2</td>
<td>3.1</td>
<td>3.1</td>
</tr>
<tr>
<td>Dielectric tangent @ 1 MHz</td>
<td>2E-03</td>
<td>4E-03</td>
<td>3E-03</td>
</tr>
</tbody>
</table>

### Electrical Properties After Cure

<table>
<thead>
<tr>
<th>Property</th>
<th>Dow Corning® SE 9168 RTV Adhesive</th>
<th>Dow Corning® SE 9189 L Gray or White RTV Adhesive</th>
<th>Dow Corning® SE 1714 Beige or Black</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dielectric strength, kV/mm</td>
<td>26</td>
<td>28</td>
<td>25</td>
</tr>
<tr>
<td>Volume resistivity, Ω•cm</td>
<td>8E+15</td>
<td>1E+15</td>
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</tr>
<tr>
<td>Dielectric constant @ 1 MHz</td>
<td>3.2</td>
<td>3.1</td>
<td>3.1</td>
</tr>
<tr>
<td>Dielectric tangent @ 1 MHz</td>
<td>2E-03</td>
<td>4E-03</td>
<td>3E-03</td>
</tr>
</tbody>
</table>

(1) Thickness of 3 mm.
NA = Not applicable (not measured due to inappropriate test method).
– = Not available.
<table>
<thead>
<tr>
<th>Adhesives/Sealants</th>
<th>Thermal Potting/Encapsulants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
<td>Two part; heat cure elastomer</td>
</tr>
<tr>
<td><strong>Product name</strong></td>
<td></td>
</tr>
<tr>
<td>Dow Corning® EE-1840 A&amp;B Kit</td>
<td></td>
</tr>
<tr>
<td>Sylgard® 160 Silicone Elastomer</td>
<td></td>
</tr>
<tr>
<td>Sylgard® 170 Silicone Elastomer</td>
<td></td>
</tr>
<tr>
<td>Dow Corning® SE 1816 CV Kit</td>
<td></td>
</tr>
<tr>
<td>Sylgard® 567 Primerless Silicone Encapsulant</td>
<td></td>
</tr>
<tr>
<td>Dow Corning® CN 8760 Thermally Conductive Encapsulant</td>
<td></td>
</tr>
<tr>
<td><strong>Features</strong></td>
<td></td>
</tr>
<tr>
<td>Self-priming adhesion</td>
<td>Flowable; self-priming adhesion; heat cure</td>
</tr>
<tr>
<td>Room temperature cure</td>
<td>Thermally conductive; low cost; reworkable</td>
</tr>
<tr>
<td>MIL-PRF- 23586F; room temperature cure</td>
<td>Thermally conductive; low cost; reworkable; higher UL grade than Dow Corning® CN 8760 Thermally Conductive Encapsulant</td>
</tr>
<tr>
<td>Moderate-temperature cure; transparent</td>
<td></td>
</tr>
<tr>
<td>Transparent</td>
<td></td>
</tr>
<tr>
<td><strong>Flame retardance</strong></td>
<td>UL 94 V-1</td>
</tr>
<tr>
<td><strong>Low molecular weight of siloxane control grade</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Potential uses</strong></td>
<td>LED modules</td>
</tr>
<tr>
<td><strong>Mixing ratio</strong></td>
<td>1:1</td>
</tr>
<tr>
<td><strong>Appearance</strong></td>
<td>Black</td>
</tr>
<tr>
<td><strong>Viscosity @ 25°C, mPa•S</strong></td>
<td>1,125</td>
</tr>
<tr>
<td><strong>Pot life @ 25°C, hr</strong></td>
<td>0.2</td>
</tr>
<tr>
<td><strong>Cure time</strong></td>
<td>168 hr @ 25°C</td>
</tr>
<tr>
<td><strong>Physical Properties After Cure</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Density @ 25°C, g/cm³</strong></td>
<td>1.01</td>
</tr>
<tr>
<td><strong>Durometer – JIS Type A</strong></td>
<td>22</td>
</tr>
<tr>
<td><strong>Penetration – JIS K2220, mm/10</strong></td>
<td>–</td>
</tr>
<tr>
<td><strong>Tensile strength, MPa</strong></td>
<td>0.6</td>
</tr>
<tr>
<td><strong>Elongation, %</strong></td>
<td>185</td>
</tr>
<tr>
<td><strong>Linear coefficient of thermal expansion, micron/m °C or ppm</strong></td>
<td>–</td>
</tr>
<tr>
<td><strong>Thermal conductivity, W/m•K</strong></td>
<td>–</td>
</tr>
<tr>
<td><strong>Low-molecular-weight siloxane content, %</strong></td>
<td>–</td>
</tr>
<tr>
<td><strong>Adhesion Properties After Cure</strong></td>
<td></td>
</tr>
<tr>
<td>Lap shear adhesion, N/cm²</td>
<td>35/AL</td>
</tr>
<tr>
<td><strong>Electrical Properties After Cure</strong></td>
<td></td>
</tr>
<tr>
<td>Dielectric strength, kV/mm</td>
<td>17</td>
</tr>
<tr>
<td>Volume resistivity, Ω•cm</td>
<td>3.2E+15</td>
</tr>
<tr>
<td>Dielectric constant @ 1 MHz</td>
<td>3.1</td>
</tr>
<tr>
<td>Dielectric tangent @ 1 MHz</td>
<td>2.7E-03</td>
</tr>
</tbody>
</table>

---

1. Mixed viscosity.
2. Pot life after mixing.
3. NA = Not applicable (not measured due to inappropriate test method).
4. – = Not available.
## THERMALLY CONDUCTIVE MATERIALS

### Thermal Interface Materials

<table>
<thead>
<tr>
<th>Product name</th>
<th>Category</th>
<th>Thermal grease compound</th>
<th>Thermally Conductive Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dow Corning® SE 4940 CV</strong> Thermo<strong>Conductive Compound</strong></td>
<td><strong>Dow Corning® TC-5022 Thermally Conductive Compound</strong></td>
<td><strong>Dow Corning® TC-5026 Thermally Conductive Compound</strong></td>
<td><strong>Dow Corning® TC-5121C Thermally Conductive Compound</strong></td>
</tr>
<tr>
<td><strong>Dow Corning® TC-5622</strong> Thermally Conductive Compound</td>
<td><strong>Dow Corning® CN-8880 Thermal Grease</strong></td>
<td><strong>Dow Corning® SC 102 Compound</strong></td>
<td><strong>Dow Corning® 340 Heat Sink Compound</strong></td>
</tr>
</tbody>
</table>

### Features

- **High thermal conductivity**
- **Low thermal resistance; high thermal conductivity**
- **Medium thermal conductivity; low oil penetration**
- **Low oil penetration**

### Flame retardance

- **UL 94 V-0**

### Low molecular weight of siloxane control grade

- 

### Potential uses

- **Thermistors; power IC; power modules; CPU peripherals**
- **Thermal management of CPUs**
- **Thermal interface material for CPUs**
- **Thermal coupling of medium-voltage electrical/electronic devices to heat sinks**
- **Thermal interface material for CPUs**
- **Thermal coupling of electrical/electronic devices to heat sinks**

### Mixing ratio

- NA

### Appearance

- White
- Gray
- Gray
- Greenish yellow
- Gray
- White
- White
- White

### Viscosity @ 25°C, mPa•S

- 520
- 77
- 102
- 85.7
- 95
- 836
- 29,000
- 542,000

### Oil separation – JIS K2220, %

- 0.00
- –
- –
- –
- <0.01
- 0.14(1)
- 0.35(1)

### Volatile contents, %

- 0.04
- 0.05
- 0.05
- 0.30
- –
- 0.14
- 0.3
- 0.27

### Tack-free time, min

- NA
- NA
- NA
- NA
- NA
- NA
- NA
- –

### Pot life @ 25°C, hr

- NA
- NA
- NA
- NA
- NA
- NA
- NA
- –

### Cure time

- NA
- NA
- NA
- NA
- NA
- NA
- NA
- –

### Physical Properties After Cure

<table>
<thead>
<tr>
<th>Density @ 25°C, g/cm³</th>
<th>Durometer – JIS Type A</th>
<th>Penetration – JIS K2207, mm/10</th>
<th>Tensile strength, MPa</th>
<th>Elongation, %</th>
<th>Linear coefficient of thermal expansion, microm/m°C or ppm</th>
<th>Thermal conductivity, W/m•K</th>
<th>Low-molecular-weight siloxane content, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.63</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>–</td>
<td>1.91</td>
<td>0.025</td>
</tr>
<tr>
<td>3.23</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>–</td>
<td>4.4</td>
<td>NA</td>
</tr>
<tr>
<td>3.53</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>–</td>
<td>2.87</td>
<td>NA</td>
</tr>
<tr>
<td>4.00</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>–</td>
<td>2.9</td>
<td>NA</td>
</tr>
<tr>
<td>2.53</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>–</td>
<td>4.3</td>
<td>NA</td>
</tr>
<tr>
<td>2.15</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>–</td>
<td>1</td>
<td>NA</td>
</tr>
<tr>
<td>2.45</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>–</td>
<td>0.9</td>
<td>NA</td>
</tr>
<tr>
<td>2.13</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>–</td>
<td>0.68</td>
<td>NA</td>
</tr>
</tbody>
</table>

### Electrical Properties After Cure

<table>
<thead>
<tr>
<th>Thermal resistance @ 40 psi, °C/cm/W</th>
<th>Dielectric strength, kV/mm</th>
<th>Volume resistivity, Ω•cm</th>
<th>Dielectric constant @ 1 MHz</th>
<th>Dielectric tangent @ 1 MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.77</td>
<td>–</td>
<td>2E+14</td>
<td>4.8 @ 50 Hz</td>
<td>1E-03 @ 50 Hz</td>
</tr>
<tr>
<td>0.061</td>
<td>3</td>
<td>5E+10</td>
<td>18 @ 1 kHz</td>
<td>0.562 @ 1 kHz</td>
</tr>
<tr>
<td>0.03</td>
<td>8.94</td>
<td>5.9E+11</td>
<td>7.4 @ 1 kHz</td>
<td>0.003 @ 1 kHz</td>
</tr>
<tr>
<td>0.09</td>
<td>5</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>0.06</td>
<td>8.7</td>
<td>3E+15</td>
<td>4.0 @ 50 Hz</td>
<td>2E-02 @ 50 Hz</td>
</tr>
<tr>
<td>–</td>
<td>2</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

### Notes

- (1)24 hr @ 120°C.
- NA = Not applicable (not measured due to inappropriate test method).
- – = Not available.
## Thermally Conductive Materials

<table>
<thead>
<tr>
<th>Features</th>
<th>High thermal conductivity</th>
<th>High thermal conductivity; short tack-free time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flame retardance</td>
<td>UL 94 V-0</td>
<td></td>
</tr>
<tr>
<td>Low molecular weight of siloxane control grade</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Potential uses</td>
<td>Power supply parts; inkjets; dot printer heads; ECU; adhesion to heat sink of driver IC; PDP modules</td>
<td>Parts fixing on printed circuit board power supply modules</td>
</tr>
</tbody>
</table>

### Physical Properties After Cure

<table>
<thead>
<tr>
<th>Property</th>
<th>Dow Corning® SE 4420 Thermally Conductive Adhesive</th>
<th>Dow Corning® SE 4486 Thermally Conductive Adhesive</th>
<th>Dow Corning® SE 4485 Thermally Conductive Adhesive</th>
<th>Dow Corning® SE 9184 White RTV</th>
<th>Dow Corning® TC-1500 Thermally Conductive Adhesive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density @ 25°C, g/cm³</td>
<td>2.26</td>
<td>2.59</td>
<td>2.90</td>
<td>2.22</td>
<td>2.32</td>
</tr>
<tr>
<td>Durometer – JIS Type A</td>
<td>76</td>
<td>81</td>
<td>90.4</td>
<td>74</td>
<td>82</td>
</tr>
<tr>
<td>Penetration – JIS K2207, mm/10</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Tensile strength, MPa</td>
<td>4.14</td>
<td>3.94</td>
<td>3.39</td>
<td>3.17</td>
<td>2.7</td>
</tr>
<tr>
<td>Elongation, %</td>
<td>77.5</td>
<td>43</td>
<td>–</td>
<td>60</td>
<td>–</td>
</tr>
<tr>
<td>Linear coefficient of thermal expansion, micron/m °C or ppm</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Thermal conductivity, W/m•K</td>
<td>0.92</td>
<td>1.59</td>
<td>2.8</td>
<td>0.84</td>
<td>1.55</td>
</tr>
<tr>
<td>Low-molecular-weight siloxane content, %</td>
<td>–</td>
<td>0.0007</td>
<td>0.0007</td>
<td>0.0022</td>
<td>–</td>
</tr>
</tbody>
</table>

### Adhesion Properties After Cure

<table>
<thead>
<tr>
<th>Property</th>
<th>Dow Corning® SE 4420 Thermally Conductive Adhesive</th>
<th>Dow Corning® SE 4486 Thermally Conductive Adhesive</th>
<th>Dow Corning® SE 4485 Thermally Conductive Adhesive</th>
<th>Dow Corning® SE 9184 White RTV</th>
<th>Dow Corning® TC-1500 Thermally Conductive Adhesive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lap shear adhesion, N/cm²</td>
<td>267/AL</td>
<td>165/GL</td>
<td>116/GL</td>
<td>170/GL</td>
<td>140/AL</td>
</tr>
</tbody>
</table>

### Electrical Properties After Cure

<table>
<thead>
<tr>
<th>Property</th>
<th>Dow Corning® SE 4420 Thermally Conductive Adhesive</th>
<th>Dow Corning® SE 4486 Thermally Conductive Adhesive</th>
<th>Dow Corning® SE 4485 Thermally Conductive Adhesive</th>
<th>Dow Corning® SE 9184 White RTV</th>
<th>Dow Corning® TC-1500 Thermally Conductive Adhesive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dielectric strength, kV/mm</td>
<td>28</td>
<td>20</td>
<td>19</td>
<td>20</td>
<td>18</td>
</tr>
<tr>
<td>Volume resistivity, Ω•cm</td>
<td>1E+15</td>
<td>2E+14</td>
<td>8E+14</td>
<td>2E+15</td>
<td>5E+15</td>
</tr>
<tr>
<td>Dielectric constant @ 1 MHz</td>
<td>4.1</td>
<td>4.8</td>
<td>5.6</td>
<td>3.9</td>
<td>3.5 @ 100 kHz</td>
</tr>
<tr>
<td>Dielectric tangent @ 1 MHz</td>
<td>2E-03</td>
<td>3E-03</td>
<td>5E-03</td>
<td>2E-03</td>
<td>–</td>
</tr>
</tbody>
</table>

NA = Not applicable (not measured due to inappropriate test method).
– = Not available.

### THERMAL CONDUCTIVITY UNIT CONVERSION CHART

<table>
<thead>
<tr>
<th>Unit</th>
<th>Conversion Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>W/m•K</td>
<td>1.0</td>
</tr>
<tr>
<td>kcal/cm•sec•°C</td>
<td>0.0024</td>
</tr>
<tr>
<td>Btu/lb•h•°F</td>
<td>0.0024</td>
</tr>
</tbody>
</table>

1 W/m•K = 2.388x10⁻⁵ kcal/cm•sec•°C = 0.0024 Btu/lb•h•°F
## Thermally Conductive Materials

<table>
<thead>
<tr>
<th>Category</th>
<th>Product name</th>
<th>Features</th>
<th>Mixing ratio</th>
<th>Appearance</th>
<th>Viscosity @ 25°C, mPa•s</th>
<th>Penetration – JIS K2220, mm/10 (worked 80 times)</th>
<th>Oil separation – JIS K2220, % (24 hr @ 120°C)</th>
<th>Volatile contents, %</th>
<th>Tack-free time, min</th>
<th>Pot life @ 25°C, hr</th>
<th>Cure time</th>
<th>Physical Properties After Cure</th>
<th>Adhesion Properties After Cure</th>
<th>Electrical Properties After Cure</th>
</tr>
</thead>
<tbody>
<tr>
<td>One part; heat cure thermally conductive adhesive</td>
<td>Dow Corning® SE 4450 Thermally Conductive Adhesive</td>
<td>High thermal conductivity</td>
<td>NA</td>
<td>Gray</td>
<td>66,400</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>4</td>
<td>0.5 hr @ 150°C</td>
<td>345/AL</td>
<td>22.2</td>
<td>7E+15</td>
</tr>
<tr>
<td>Two part; moisture cure/heat cure printable or dispensable pad</td>
<td>Dow Corning® 1-4173 Thermally Conductive Adhesive</td>
<td>Primerless adhesion, including 0.178 mm glass bead</td>
<td>NA</td>
<td>Gray</td>
<td>61,372</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>20 min @ 150°C</td>
<td>448/AL</td>
<td>18</td>
<td>2E+14</td>
</tr>
<tr>
<td></td>
<td>Dow Corning® 3-1818 Thermally Conductive Adhesive</td>
<td>Primerless adhesion; fast cure</td>
<td>NA</td>
<td>Gray</td>
<td>75,854</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>10 min @ 150°C</td>
<td>386</td>
<td>16</td>
<td>6.85E+13</td>
</tr>
<tr>
<td></td>
<td>Dow Corning® 3-6752 Thermally Conductive Adhesive</td>
<td>High thermal conductivity; low stress; reworkable</td>
<td>NA</td>
<td>Gray</td>
<td>83,300</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>3 min @ 150°C</td>
<td>357</td>
<td>15</td>
<td>7.10E+13</td>
</tr>
<tr>
<td></td>
<td>Dow Corning® TC-4025 Dispensable Thermal Pad</td>
<td>LED lamps and luminaires, automotive and consumer applications</td>
<td>1:1</td>
<td>Blue</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>24 hr @ 25°C; 145 min @ 40°C; 42 min @ 75°C; 15 min @ 100°C; 11 min @ 125°C</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Physical Properties After Cure

- **Density @ 25°C, g/cm³**: 2.73, 2.70, 2.63, 2.61, 2.83
- **Durometer – JIS Type A**: 95, 92, 88, 87, 49 (Shore 00)
- **Penetration – JIS K2207, mm/10**: NA, –, –, –, NA
- **Tensile strength, MPa**: 6.65, 6.2, 4.3, 3.76, 0.16
- **Elongation, %**: 45.6, 22, 20, 15, 209
- **Linear coefficient of thermal expansion, micron/m °C or ppm**: –, –, –, –, –
- **Thermal conductivity, W/m•K**: 1.92, 1.81, 1.68, 1.69, 2.5
- **Low-molecular-weight siloxane content, %**: –, –, –, –, NA

### Adhesion Properties After Cure

- **Lap shear adhesion, N/cm²**: 345/AL, 448/AL, 386, 357, NA

### Electrical Properties After Cure

- **Dielectric strength, kV/mm**: 22.2, 18, 16, 15.59, 18
- **Volume resistivity, Ω•cm**: 7E+15, 2E+14, 6.85E+13, 7.10E+13, 3.90E+12
- **Dielectric constant @ 1 kHz**: 5.9, 4.9 @ 100 kHz, 5.5 @ 100 kHz, 5.5 @ 100 kHz, 6.4
- **Dielectric tangent @ 1 MHz**: 3E-03, <3E-03 @ 100 kHz, <2.2E-04 @ 100 kHz, <1E-04 @ 100 kHz, 5E-03

### Material Thermal Conductivity, W/m•K

<table>
<thead>
<tr>
<th>Material</th>
<th>Thermal Conductivity, W/m•K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alumina (RT)</td>
<td>21</td>
</tr>
<tr>
<td>Soda glass (RT)</td>
<td>0.55-0.75</td>
</tr>
<tr>
<td>Nylon (RT)</td>
<td>0.27</td>
</tr>
<tr>
<td>Polyethylene (RT)</td>
<td>0.25-0.34</td>
</tr>
<tr>
<td>Polystyrene (RT)</td>
<td>0.08-0.12</td>
</tr>
<tr>
<td>Silicon (0°C)</td>
<td>168</td>
</tr>
<tr>
<td>Aluminum (0°C)</td>
<td>236</td>
</tr>
<tr>
<td>Gold (0°C)</td>
<td>319</td>
</tr>
<tr>
<td>Silver (0°C)</td>
<td>428</td>
</tr>
<tr>
<td>Iron (0°C)</td>
<td>84</td>
</tr>
<tr>
<td>Copper (0°C)</td>
<td>403</td>
</tr>
</tbody>
</table>

**NA** = Not applicable (not measured due to inappropriate test method).

**–** = Not available.
<table>
<thead>
<tr>
<th>Category</th>
<th>One part; resin</th>
<th>One part; modified resin</th>
<th>One part; resin</th>
<th>One part; elastomer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product name</td>
<td>Dow Corning® 1-2577 Conformal Coating</td>
<td>Dow Corning® 1-2577 Dispersion RTV Elastoplastic Conformal Coating</td>
<td>Dow Corning® 1-2577 Low VOC Conformal Coating</td>
<td>Dow Corning® SE 9186L Coating</td>
</tr>
<tr>
<td></td>
<td>Dow Corning® 1-2620 Low VOC Conformal Coating</td>
<td>Dow Corning® 1-2620 Low VOC Conformal Coating</td>
<td>Dow Corning® LDC 2577 D Silicone Conformal Coating</td>
<td>Dow Corning® EA-2000 Silicone Adhesive</td>
</tr>
<tr>
<td></td>
<td>Dow Corning® LDC 2577 D Silicone Conformal Coating</td>
<td>Dow Corning® LDC 2577 D Silicone Conformal Coating</td>
<td>Dow Corning® LDC 2577 D Silicone Coating</td>
<td>Dow Corning® EA-3000 RTV Black or White</td>
</tr>
<tr>
<td></td>
<td>Dow Corning® LDC 2577 D Silicone Coating</td>
<td>Dow Corning® LDC 2577 D Silicone Coating</td>
<td>Dow Corning® SE 9186L Silicone Coating</td>
<td>Dow Corning® EA-9187LH</td>
</tr>
<tr>
<td>Features</td>
<td>MIL-I-46058C; UL746E; fast TFF; solventborne; low viscosity</td>
<td>MIL-I-46058C; UL746E; fast TFF; solventborne; low viscosity</td>
<td>Fast tack-free; low viscosity</td>
<td>Noncorrosive; fast tack-free</td>
</tr>
<tr>
<td>Flame retardance</td>
<td>UL 94 V-0</td>
<td>UL 94 V-0</td>
<td></td>
<td>High viscosity</td>
</tr>
<tr>
<td>Low molecular weight of silicone control grade</td>
<td></td>
<td></td>
<td>Low viscosity</td>
<td>Low viscosity</td>
</tr>
<tr>
<td>Potential uses</td>
<td>Coatings for circuit boards and electronic printed wiring boards (PWB)</td>
<td>Coatings for circuit boards and electronic printed wiring boards (PWB)</td>
<td>Coatings for connectors, electronic parts, circuit boards</td>
<td>Coatings for circuit boards and electronic printed wiring boards (PWB)</td>
</tr>
<tr>
<td>Appearance</td>
<td>Transparent</td>
<td>Transparent</td>
<td>Transparent</td>
<td>Translucent, Black</td>
</tr>
<tr>
<td>Viscosity @ 25°C, mPa•S</td>
<td>950</td>
<td>150</td>
<td>1,094</td>
<td>350</td>
</tr>
<tr>
<td>Tack-free time, min</td>
<td>7</td>
<td>5</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Cure time</td>
<td>RTC: 60 min&lt;sup&gt;1&lt;/sup&gt;; HC: &gt;2 min @ 60°C/15% RH</td>
<td>RTC: 60 min&lt;sup&gt;1&lt;/sup&gt;; HC: &gt;2 min @ 60°C/15% RH</td>
<td>RTC: 60 min&lt;sup&gt;1&lt;/sup&gt;; HC: &gt;2 min @ 60°C/15% RH</td>
<td>RTC: 10 min&lt;sup&gt;1&lt;/sup&gt;; HC: &gt;2 min @ 60°C/15% RH</td>
</tr>
<tr>
<td></td>
<td>RTC: 24 hr @ 25°C/50% RH&lt;sup&gt;1&lt;/sup&gt;</td>
<td>RTC: 24 hr @ 25°C/50% RH&lt;sup&gt;1&lt;/sup&gt;</td>
<td>RTC: 24 hr @ 25°C/50% RH&lt;sup&gt;1&lt;/sup&gt;</td>
<td>RTC: 24 hr @ 25°C/50% RH&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Density @ 25°C, g/cm³</td>
<td>1.11</td>
<td>1.11</td>
<td>1.12</td>
<td>1.12</td>
</tr>
<tr>
<td>Durometer – JIS Type A</td>
<td>20 (Shore D)</td>
<td>25 (Shore D)</td>
<td>25 (Shore D)</td>
<td>23 (Shore D)</td>
</tr>
<tr>
<td>Low-molecular-weight siloxane content, %</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0.0023/0.0029</td>
</tr>
<tr>
<td>Electrical Properties After Cure</td>
<td>Dielectric strength, kV/mm</td>
<td>16</td>
<td>22</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Volume resistivity, Ω•cm</td>
<td>5E+13</td>
<td>4.6E+13</td>
<td>2E+14</td>
</tr>
<tr>
<td></td>
<td>Dielectric constant @ 1 MHz</td>
<td>2.7 @ 100 kHz</td>
<td>2.7 @ 100 kHz</td>
<td>2.3 @ 100 kHz</td>
</tr>
<tr>
<td></td>
<td>Dielectric tangent @ 1 MHz</td>
<td>&lt;2E-04 @ 100 kHz</td>
<td>3E-04 @ 100 kHz</td>
<td>3E-04 @ 100 kHz</td>
</tr>
</tbody>
</table>

<sup>1</sup>1 mm thickness.
<sup>2</sup>75 μm thickness.
<sup>3</sup>3 mm thickness.
RTC = Room temperature cure.
HC = Heat cure.
– = Not available.
## Conformal Coatings

<table>
<thead>
<tr>
<th>Category</th>
<th>One part; elastomer</th>
<th>One part; heat cure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product name</td>
<td>Dow Corning® 3-1953 Conformal Coating</td>
<td>Dow Corning® 3-1965 Conformal Coating</td>
</tr>
<tr>
<td></td>
<td>Dow Corning® 3-1944 RTV Coating</td>
<td>Dow Corning® HC2000 Controlled Volatility CV Conformal Coating</td>
</tr>
<tr>
<td></td>
<td>Dow Corning® SE 9189 L Gray or White RTV Adhesive</td>
<td>Dow Corning® HC1000</td>
</tr>
<tr>
<td></td>
<td>Dow Corning® 1-4105 Conformal Coating</td>
<td>Dow Corning® Q1-4010 Conformal Coating</td>
</tr>
</tbody>
</table>

### Features
- **Low viscosity, MIL-I-46058C**
- **High viscosity**
- **Noncorrosive; low viscosity**
- **Noncorrosive; fast tack-free, high viscosity**
- **Noncorrosive; low viscosity**

### Flame retardance
- UL 94 V-0
- UL 94 V-0
- UL 94 V-0
- UL 94 V-0
- UL 94 V-1
- UL 94 V-1

### Low molecular weight of siloxane control grade

### Potential uses
- Rigid and flexible circuit boards; electronic printed wiring boards (PWB); sensitive components and fine-pitch designs
- Coatings for connectors, electronic parts, circuit boards
- Coatings for connectors, electronic parts, circuit boards
- Rigid and flexible circuit boards; electronic printed wiring boards (PWB); sensitive components and fine-pitch designs

### Appearance
- Translucent
- Translucent
- Translucent
- Translucent
- White, gray
- Clear
- Clear

### Viscosity @ 25°C, mPa•S
- 353
- 115
- 63,775
- 150
- 22,000
- 12,000
- 450
- 825

### Tack-free time, min
- 8
- 6
- 14
- 18
- 8
- 11

### Cure time
- RTC: 30 min; HC: 1.5 min @ 60°C/15% RH
- RTC: 30 min; HC: 2 min @ 60°C/15% RH
- RTC: 60 min; HC: 5 min @ 25°C/50% RH
- RTC: 90 min @ 25°C/50% RH
- RTC: 24 hr @ 25°C/50% RH
- RTC: 300 min @ 25°C/50% RH
- 5 min @ 100°C
- 10 min @ 100°C

### Physical Properties After Cure

<table>
<thead>
<tr>
<th>Density @ 25°C, g/cm³</th>
<th>0.98</th>
<th>0.99</th>
<th>1.03</th>
<th>1.01</th>
<th>1.19</th>
<th>1.07</th>
<th>0.97</th>
<th>1.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Durometer – JIS Type A</td>
<td>34</td>
<td>33</td>
<td>36</td>
<td>25</td>
<td>33</td>
<td>24</td>
<td>64 (Shore 00)</td>
<td>33</td>
</tr>
<tr>
<td>Low-molecular-weight siloxane content, %</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0.0025</td>
<td>0.0015</td>
<td>0.005</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

### Electrical Properties After Cure

<table>
<thead>
<tr>
<th>Dielectric strength, kV/mm</th>
<th>17</th>
<th>17</th>
<th>21</th>
<th>33</th>
<th>25</th>
<th>21</th>
<th>20</th>
<th>23</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume resistivity, Ω•cm</td>
<td>5.5E+15</td>
<td>9E+14</td>
<td>1.6E+15</td>
<td>1E+17</td>
<td>9E+14</td>
<td>2E+15</td>
<td>2.7E+13</td>
<td>2E+14</td>
</tr>
<tr>
<td>Dielectric constant @ 1 MHz</td>
<td>–</td>
<td>–</td>
<td>2.73 @ 100 kHz</td>
<td>2.7</td>
<td>3.1</td>
<td>3.2</td>
<td>2.6 @ 100 kHz</td>
<td>2.6 @ 100 kHz</td>
</tr>
<tr>
<td>Dielectric tangent @ 1 MHz</td>
<td>&lt;2E-04 @ 100 kHz</td>
<td>&lt;2E-04 @ 100 kHz</td>
<td>&lt;2E-04 @ 100 kHz</td>
<td>5E-03</td>
<td>4E-03</td>
<td>3E-03</td>
<td>&lt;2E-04 @ 100 kHz</td>
<td>3E-4 @ 100 kHz</td>
</tr>
</tbody>
</table>

Notes:
- 1 mm thickness.
- 3 mm thickness.
- 0.3 mm thickness.
- RTC = Room temperature cure.
- HC = Heat cure.
- – = Not available.
Features and Characteristics of Silicone

Chemical features of silicone

- Long Si-O bond distance
- Large bond angle
- High bond energy
- Weak van der Waals force
- Covered with CH$_3$ group

Characteristics of silicone

- Long Si-O bond distance; wide bond angle
- High bond energy
- Weak van der Waals force
- Covered with CH$_3$ group
- Easy rotation of polymer chain
- Stable bond
- Less temperature-dependent
- Low viscosity
- Hydrophobicity
- Low modulus
- Heat resistance
- Cold resistance
- Good workability
- Vapor permeability
- Low moisture absorption
About room temperature cure
The most common cure type is one-part moisture cure. There are several types, depending on reactive by-products (e.g., deoxime type and dealcohol type). There also are two-part condensation cure types in which curing starts from the surface exposed to air towards the deep section, and its cure speed depends on the absolute moisture. Therefore, although it depends on the size of the substrate, this cure type is not appropriate for bonding larger surfaces.

Pattern diagram of condensation reaction
(An example of dealcohol type)

\[ -O-Si-OCH_3+H_2O \rightarrow -O-Si-O-Si-O-+2CH_3OH \]

Storage recommendations
Storage requirements differ for each product.

- **Products to store in a cool, dark place:** We recommend storing products in a cool, dark place, except for those that require cold storage or refrigeration.

- **Products requiring cold storage or refrigeration:** As a rule, for one-part addition-cure products requiring cold storage, store between 0 and 5°C; for one-part addition-cure products requiring refrigeration, store between -25 and -15°C.

About low-molecular-weight siloxane
When a micro-relay, micro-switch or similar micro-element is in airtight or semi-airtight conditions, ingredients emitted from silicone materials can insulate contact points from electric energy, which may cause continuity or contact failure. These emitted ingredients, called low-molecular-weight siloxane, are shown below. Low-molecular-weight siloxane reduction grades contain reduced amounts of low-molecular-weight siloxane.

Structure of low-molecular siloxane

Guidelines on viscosity before cure

Conversion factors of SI units and traditional unit

<table>
<thead>
<tr>
<th>Property</th>
<th>Traditional Unit</th>
<th>Conversion Factor and SI Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viscosity</td>
<td>cSt</td>
<td>1.00 mm²/s</td>
</tr>
<tr>
<td>Viscosity</td>
<td>cP</td>
<td>1.00 Pa.s</td>
</tr>
<tr>
<td>Viscosity</td>
<td>P</td>
<td>0.100 Pa.s</td>
</tr>
<tr>
<td>Tensile strength, modulus</td>
<td>kgf/cm²</td>
<td>0.0981 MPa</td>
</tr>
<tr>
<td>Lap shear adhesion</td>
<td>kgf/cm²</td>
<td>9.81 N/cm²</td>
</tr>
<tr>
<td>Thermal conductivity</td>
<td>cal/cm.s.ºC</td>
<td>419 W/m.k</td>
</tr>
<tr>
<td>Complex elastic modulus</td>
<td>dyne/cm²</td>
<td>0.100 Pa.s</td>
</tr>
<tr>
<td>Torque</td>
<td>kgf.cm</td>
<td>0.0981 N.m</td>
</tr>
<tr>
<td>Tear strength, peel</td>
<td>kgf/cm</td>
<td>0.981 N/mm</td>
</tr>
</tbody>
</table>

About UL recognition
For further information on UL recognition of each product, please see the online certification directory at [ul.com](http://ul.com). File numbers of the products listed in this brochure are E55519, E229242, E92494, E177248 and E40195.

About correlation between hardness after cure and complex modulus

Correlation between penetration and complex modulus for gel

Correlation between hardness and complex modulus for elastomer
How Can We Help You Today?

Tell us about your performance, design and manufacturing challenges. Let us put our silicon-based materials expertise, application knowledge and processing experience to work for you.

For more information about our materials and capabilities, visit dowcorning.com.

To discuss how we could work together to meet your specific needs, email electronics@dowcorning.com or go to dowcorning.com/ContactUs for a contact close to your location.

Dow Corning has customer service teams, science and technology centers, application support teams, sales offices, and manufacturing sites around the globe.