Product Information

**Thermal Interface - Wet Dispensed**

**FEATURES**
- Low Modulus
- Low Viscosity
- Good Thermal Conductivity

**BENEFITS**
- Excellent "Wet Out" of surfaces
- Effectively dissipates heat

**COMPOSITION**
- 2-part. gray
- 1:1 mix ratio
- Polydimethylsiloxane elastomer

**APPLICATION METHODS**
- Manual Dispense
- Automated Meter-Mix

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**Dow Corning®**

**3-6651 Thermally Conductive Elastomer**

**TYPICAL PROPERTIES**
Specification Writers: These values 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 this product.

<table>
<thead>
<tr>
<th>Property</th>
<th>Unit</th>
<th>Value</th>
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<tbody>
<tr>
<td>Viscosity (Part A)</td>
<td>cP</td>
<td>20425</td>
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<tr>
<td></td>
<td>mPa-sec</td>
<td>20425</td>
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<td></td>
<td>Pa-sec</td>
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<td>Viscosity (Part B)</td>
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<td></td>
<td>mPa-sec</td>
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<td></td>
<td>Pa-sec</td>
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<td>Viscosity (Mixed)</td>
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<td>mPa-sec</td>
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<td></td>
<td>Pa-sec</td>
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<td>Specific Gravity (Cured)</td>
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<td>Working Time at 25ºC (Pot Life - hours)</td>
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<td>Heat cure time @120C</td>
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<td>Durometer Shore 00</td>
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<td>Thermal Conductivity</td>
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<td></td>
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<td></td>
<td>kV/mm</td>
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<td>Dielectric Constant at 100 Hz</td>
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<tr>
<td>Dielectric Constant at 100 kHz</td>
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<tr>
<td>Dissipation Factor at 100 hz</td>
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<tr>
<td>Dissipation Factor at 100 kHz</td>
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<tr>
<td>Volume Resistivity</td>
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<td>Linear CTE (by TMA)</td>
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<td>Shelf Life at 30ºC</td>
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DESCRIPTION
Dow Corning thermally conductive silicone encapsulants are supplied as two-part liquid component kits. When the liquid components are thoroughly mixed, the mixture cures to a flexible elastomer, suitable for the protection of electrical/ electronic applications where heat dissipation is critical. These elastomers cure without exotherm at a constant rate regardless of sectional thickness or degree of confinement. Dow Corning thermally conductive elastomers require no post-cure and can be placed in service immediately at operating temperatures of -45 to 200°C (-49 to 392 ºF) following the completion of the cure schedule. Long-term, reliable protection of sensitive circuits and components is important in many of today’s delicate and demanding electronic applications. With the increase in processing power and the trend toward smaller, more compact electronic modules, the need for thermal management is growing. Thermally conductive silicones function as heat transfer media, durable dielectric insulation, barriers against environmental contaminants and as stress-relieving shock and vibration absorbers over a wide temperature and humidity range. In addition to sustaining their physical and electrical properties over a broad range of operating conditions, silicones are resistant to ozone and ultraviolet degradation and have good chemical stability. Good heat transfer is dependent on a good interface between the heat producing device and the heat transfer media. Silicones have a low surface tension that enables them to wet most surfaces, which can lower the thermal contact resistance between the substrate and the material.

MIXING AND DE-AIRING
Upon standing, some filler may settle to the bottom of the liquid after several weeks. To ensure a uniform product mix, the material in each container should be thoroughly mixed prior to use. Two-part materials should be mixed in the proper ratio either by weight or volume. The presence of light-colored streaks or marbling indicates inadequate mixing. Automated airless dispense equipment can be used to reduce or avoid the need to de-air. If de-airing is required to reduce voids in the cured elastomer, consider a vacuum de-air schedule of > 8 inches Hg (or a residual pressure of 10-0 mm of Hg) for 10 minutes or until bubbling subsides.

PROCESSING/CURING
Addition-cure adhesives should be cured at 100°C (212 ºF) or above. The cure rate is rapidly accelerated with heat (see heat-cure times in Typical Properties table). Thin sections of less than mils may be cured in 15 minutes at 150°C (30 ºF). For thicker sections, a pre-cure at 70°C (158ºF) may be necessary to reduce voids in the elastomer. Length of pre-cure will depend on section thickness and confinement of adhesive. It is recommended that 30 minutes at 70°C (158ºF) be used as a starting point for determining necessary pre-cure time. Addition-curing materials contain all the ingredients needed for cure with no by-products from the cure mechanism. Deep-section or confined cures are possible. Cure progresses evenly throughout the material. These adhesives generally have long working times.

POT LIFE AND CURE RATE
Cure reaction begins with the mixing process. Initially, cure is evidenced by a gradual increase in viscosity, followed by gelation and conversion to its final state. Pot life is defined as the time required for viscosity to double after Parts A and B (base and curing agent) are mixed.

USEFUL TEMPERATURE RANGES
For most uses, silicone encapsulants should be operational over a temperature range of -45 to 200°C (-49 to 392 ºF) for long periods of time. However, at both the low and high temperature ends of the spectrum, behavior of the materials and performance in particular applications can become more complex and require additional considerations. For low-temperature performance, thermal cycling to conditions such as -55°C (-67°F) may be possible for most products, but performance should be verified for your parts or assemblies. Factors that may influence performance are configuration and stress sensitivity of components, cooling rates and hold times, and prior temperature history. At the high-temperature end, the durability of the cured silicones is time and temperature dependent. As expected, the higher the temperature, the shorter the time the material will remain useable.

REPAIRABILITY
When repairing an area using an encapsulant, roughen the exposed surfaces of the cured encapsulant with an abrasive paper and rinse with a suitable solvent. This will enhance adhesion and permit the repaired material to become an integral matrix with the existing encapsulant.

SOLVENT EXPOSURE
Although highly filled silicones such as those discussed in this data sheet are generally more resistant to solvent or fuel exposure, standard silicones are intended only to survive splash or intermittent exposures. Testing should be done to confirm performance of the adhesives in the application and under the specified environmental conditions.

USABLE LIFE AND STORAGE
Shelf life is indicated by the “Use By” date found on the product label. For best results, Dow Corning thermally conductive materials should be stored at or below the maximum specified storage temperature. Special precautions must be taken to prevent moisture from contacting these materials. Containers should be kept tightly closed and head or air space minimized. Partially filled containers
should be purged with dry air or other gases, such as nitrogen. Any special storage and handling instructions will be printed on the product containers.

HANDLING
PRECAUTIONS
PRODUCT SAFETY
INFORMATION REQUIRED
FOR SAFE USE IS NOT
INCLUDED IN THIS
DOCUMENT. BEFORE
HANDLING, READ PRODUCT
AND MATERIAL SAFETY DATA
SHEETS AND CONTAINER
LABELS FOR SAFE USE,
PHYSICAL AND HEALTH
HAZARD INFORMATION. THE
MATERIAL SAFETY DATA
SHEET IS AVAILABLE ON THE
DOW CORNING WEBSITE AT
WWW.DOWCORNING.COM, OR
FROM YOUR DOW CORNING
REPRESENTATIVE, OR
DISTRIBUTOR, OR BY
CALLING YOUR GLOBAL DOW
CORNING CONNECTION.

HEALTH AND
ENVIRONMENTAL
INFORMATION
To support Customers in their
product safety needs, Dow Corning
has an extensive Product Stewardship
organization and a team of Product
Safety and Regulatory Compliance
(PS&RC) specialists available in each
area. For further information, please
see our website, www.dowcorning.com or consult
your local Dow Corning
representative.

LIMITATIONS
This product is neither tested nor
represented as suitable for medical or
pharmaceutical uses.

LIMITED WARRANTY
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The information contained herein is
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to be accurate. However, because
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products are beyond our control, this
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ensure that our products are safe,
effective, and fully satisfactory for
the intended end use. Suggestions of
use shall not be taken as inducements
to infringe any patent. Dow
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products will meet the sales
specifications in effect at the time of
shipment. Your exclusive remedy for
breach of such warranty is limited to
refund of purchase price or
replacement of any product shown to
be other than as warranted.

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A PARTICULAR PURPOSE OR
MERCHANTABILITY.

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CONSEQUENTIAL DAMAGES.

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