Product Information
Electronics

DOW CORNING

Dow Corning® SE4420 Thermally Conductive Adhesive

One part, white, moisture cure, thermally conductive silicone adhesive

FEATURES & BENEFITS

- One part material
- Semi-flowable
- Fast tack-free time
- Good adhesion
- Thermally conductive

COMPOSITION

- Thermally conductive filler
- Polydimethylsiloxane adhesive

APPLICATIONS

- *Dow Corning*® SE 4420 Thermally Conductive Adhesive is designed to provide efficient thermal transfer for the cooling of electronic modules, including telecom and power supply devices.

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.

Property	Unit	Result
One part or Two Part	-	One
Color	-	White
Fluidity	mm	48
	in	1.9
Specific Gravity (Cured)	-	2.26
NVC (Non Volatile Content)	%	98
Tack-Free Time at 25ºC	minutes	8
Tensile Strength	psi	600
	MPa	4.1
	kg/cm^2	42.2
Elongation	%	77
Durometer Shore A (JIS)	-	76
Unprimed Adhesion - Lap Shear to Aluminum	psi	390
	MPa	2.7
	N/cm^2	267
Thermal Conductivity	Btu/hr-ft-°F	0.53
	W/mK	0.92

DESCRIPTION

One-part RTV-cure thermally conductive materials cure with moisture exposure to produce durable, relatively low-stress elastomer with a noncorrosive by-product. Electronic devices are continually designed to deliver higher performance. Especially in the area of consumer electronics, there is also a continual trend towards smaller, more compact designs. In combination these factors typically mean that more heat is generated in the device. Thermal management of electronic devices is a primary concern of design engineers. A cooler device allows for more efficient operation and better reliability over the life of the device. As such, thermally conductive compounds play an integral role here. Thermally conductive materials act as a thermal “bridge” to remove heat from a heat source (device) to the ambient via a heat transfer media (i.e. heat sink). These materials have properties such as low thermal resistance, high thermal conductivity, and can achieve thin Bond Line Thicknesses (BLTs) which can help to improve the transfer of heat away from the device.

APPLICATION METHODS

- Manual or automated dispensing

SUBSTRATE TESTING

To ensure maximum bond strength for adhesives on a particular substrate, 100 percent cohesive failure of the adhesive in a lap shear or similar adhesive strength test is needed. This ensures compatibility of the adhesive with the substrate being considered. Also, this test can be used to determine minimum cure time or to detect the presence of surface contaminants such as mold release agents, oils, greases and oxide films.

PROCESSING/CURING

The one-part moisture-cure adhesives are generally cured at room temperature and in a range of 0 to 80 percent relative humidity. Greater than 90 percent of their full physical properties should be attained within 4 to 7 hours depending on the product chosen. These materials are not typically used for highly confined or deep section cures. Materials will generally cure about 0.5 inch (6.35 mm) per 7 days.

ADHESION

Dow Corning® brand silicone adhesives are specially formulated to provide unprimed adhesion to many reactive metals, ceramics and glass, as well as to selected laminates, resins and plastics. However, good adhesion cannot be expected on non-reactive metal substrates or non-reactive plastic surfaces such as Teflon®, polyethylene or polypropylene. Special surface treatments such as chemical etching or plasma treatment can sometimes provide a reactive surface and promote adhesion to these types of substrates. *Dow Corning*® brand primers can be used to increase the chemical activity on difficult substrates. For best results, the primer should be applied in a very thin, uniform coating and then wiped off after application. After application, primers should be thoroughly air dried prior to application of the silicone elastomer. Alternatively, use a low-viscosity primerless adhesive to pot your components. Poor adhesion can be experienced on plastic or rubber substrates that are highly plasticized, since the mobile plasticizers act as release agents. Small-scale laboratory evaluation of all substrates is recommended before production trials are made. In general, increasing the cure temperature and/or cure time will improve the ultimate adhesion.

USEFUL TEMPERATURE RANGES

For most uses, silicone adhesives should be operational over a temperature range of -45 to 200 ºC (-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 ºC (-67 ºF) 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.

SOLVENT EXPOSURE

In general, the product is resistance to minimal or intermittent solvent exposure, however best practice is to avoid solvent exposure altogether.

USABLE LIFE AND STORAGE

The product should be stored in its original packaging with the cover tightly attached to avoid any contamination. Store in accordance with any special instructions listed on the product label. The product should be used by the indicated Exp. Date found on the label.

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 WEB SITE AT DOWCORNING.COM, OR FROM YOUR DOW CORNING REPRESENTATIVE, OR DISTRIBUTOR, OR BY CALLING YOUR GLOBAL DOW CORNING CONNECTION.

LIMITATIONS

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

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, dowcorning.com or consult your local Dow Corning representative.

LIMITED WARRANTY INFORMATION – PLEASE READ CAREFULLY

The information contained herein is offered in good faith and is believed to be accurate. However, because conditions and methods of use of our products are beyond our control, this information should not be used in substitution for customer’s tests to ensure that our products are safe, effective, and fully satisfactory for the intended end use. Suggestions of use

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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.

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