Product Information

DOW CORNING

Thermal Interface - Wet Dispensed

Dow Corning® SE4445 CV Gel

1:1 mix ratio, thermally conductive silicone gel

COMPOSITION

- 2-part, gray
- Polydimethylsiloxane gel

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	Value
Shelf Life at 25ºC	months	6
Density (cured)	g/cm3	2.36
Mix Ratio	-	1:1
Viscosity (Mixed)	cP mPa-sec Pa-sec	15025 15025 15
Penetration	1/10 mm	50
Thermal Conductivity	btu/hr ft degF W/mK	0.775 1.34
UL Flammability Classification	NA	94 V-0

DESCRIPTION

Dow Corning silicone gels are soft and cure to form a cushioning, low-modulus, resilient, gelled material. Cured gels retain much of the stress relief capability while developing the dimensional stability of an elastomer. Thermally conductive gels couple the stress-relieving capability of a silicone gel with the ability to dissipate heat from devices. These thermally conductive gels can be used as potting materials for transformers, power supplies, coils, relays and other electronic devices that require a low-modulus material for thermal dissipation. They can also be used as ingredients in formulations for thermally conductive gel sheets. These silicone gels cure without exotherm at a constant rate regardless of sectional thickness or degree of confinement. 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.

SUBSTRATE TESTING

To ensure maximum bond strength for adhesives on a particular substrate, 100 percent cohesive failure of the gel in a lap shear or similar adhesive strength test is needed. This ensures compatibility of the gel 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.

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

Cure rates are rapidly accelerated with heat (see heat-cure times in Typical Properties table). 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 materials 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 gels should be operational over a temperature range of -45 to 150ºC (-49 to 302 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 -55ºC (-67ºF) 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

A gel can simply be poured into the cleaned repaired area and cured.

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 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 shall not be taken as inducements to infringe any patent. Dow Corning's sole warranty is that our 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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