Technical Data Sheet

DOWSIL™ ME-4139 Encapsulant Dark Grey

One-part, high purity silicone elastomer

Features & Benefits

- High purity
- Controlled thixotropy and yet flowable as dispensed
- Optimum coating to cover bonding wires
- Flexibility over a wide temperature range
- Excellent dielectric properties
- Excellent adhesion to ceramic, epoxy and polyimide substrates
- Protection from moisture, dirt and other contaminants
- One-part elastomer with fast heat cure

Applications

- For applications where a semiconductor die has been wire bonded to a flat surface.
- Particularly suited to applications where there is a need for a flexible coating. For example with wide extremes of temperature, with the use of a pliable epoxy substrate or where severe thermal shocks are encountered.
- Compatible with most semiconductor devices and provides environmental and physical protection of both the chip and interconnecting wires in a single application.

Typical Properties

Specification Writers: These values are not intended for use in preparing specifications.

CTM[1]	ASTM[1]	Property	Unit	Result
		Physical properties, as supplied		
		Color		Dark grey
0050	D1084	Viscosity at 2.5 rpm[2]	mPa.s	150,000
0050	D1084	Viscosity at 20 rpm[2]	mPa.s	45,000
0088		Sodium content, max.	ppm	5
0088		Potassium content, max.	ppm	5
		Physical properties, cured 1 hour at 150°C		
0099	D2240	Durometer hardness, Shore A		28
0022	D792	Relative density at 25°C		1.15
0243		Adhesion to aluminium		Cohesive failure

1. CTM: Corporate Test Method, copies of CTMs are available on request.
   ASTM: American Society for Testing and Materials.
2. Brookfield RTV spindle 7

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Typical Properties (Cont.)

CTM	ASTM	Property	Unit	Result
		Linear coefficient of thermal expansion	ppm/K	320
		Electrical properties, cured 1 hour at 150°C		
0249	D257	Volume resistivity	Ohm.cm	$6x10^{14}$
0112	D150	Permittivity at 100 kHz		3.00

How to Use

Mixing

During normal storage, there is very little settling of DOWSIL™ ME-4139 Encapsulant Dark Grey and no mixing is required. After extended periods of storage, mixing is necessary to homogenize the product. Vacuum de-airing is recommended. A vacuum of 10–20 mm mercury applied for 10 minutes will sufficiently de-air the material.

Dispensing

DOWSIL™ ME-4139 Encapsulant Dark Grey can be dispensed onto the semiconductor using either a manual or semiautomatic syringe dispensing system. Various droplet sizes can be obtained by adjusting the pressure on the plunger of the syringe and by varying the diameter of the dispensing needle.

Cure

DOWSIL™ ME-4139 Encapsulant Dark Grey should be cured using one of the recommended schedules below. Temperatures below 125°C are not recommended.

15 minutes at 200°C, or 1 hour at 150°C, or 4 hours at 125°C.

Maximum adhesion and optimal device reliability are obtained using the highest possible curing temperature up to a maximum of 200°C.

The droplet formed after curing has a minimum thickness necessary to encapsulate the bonding wires and this minimizes the expansion of the coating under a rigid top coating which may be subsequently applied over the complete circuit. If no additional coating is applied, DOWSIL™ ME-4139 Encapsulant Dark Grey is opaque to prevent light reaching the device.

Handling Precautions

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 DOW.COM, OR FROM YOUR DOW SALES APPLICATION ENGINEER, OR DISTRIBUTOR, OR BY CALLING DOW CUSTOMER SERVICE.

Usable Life and Storage

When stored at or below 10°C in the original unopened containers, this product has a usable life of 12 months from the date of production.

Refrigerated storage at temperatures as low as -18°C will extend the shelf life. Products stored under refrigeration should be tightly sealed and be allowed to warm to room temperature (approximately 8 hours) before use in closed containers to prevent the condensation of water which adversely affects the properties of the material. Long term storage at ambient temperature is not recommended.

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Packaging Information

This product is available in 1 kg containers.

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 has an extensive Product Stewardship organization and a team of product safety and regulatory compliance specialists available in each area.

For further information, please see our website, dow.com or consult your local Dow representative.

Disposal Considerations

Dispose in accordance with all local, state (provincial) and federal regulations. Empty containers may contain hazardous residues. This material and its container must be disposed in a safe and legal manner.

It is the user's responsibility to verify that treatment and disposal procedures comply with local, state (provincial) and federal regulations. Contact your Dow Technical Representative for more information.

Product Stewardship

Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products - from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Customer Notice

Dow strongly encourages its customers to review both their manufacturing processes and their applications of Dow products from the standpoint of human health and environmental quality to ensure that Dow products are not used in ways for which they are not intended or tested. Dow personnel are available to answer your questions and to provide reasonable technical support. Dow product literature, including safety data sheets, should be consulted prior to use of Dow products. Current safety data sheets are available from Dow.

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 **dow.com**.

To discuss how we could work together to meet your specific needs, go to **dow.com** for a contact close to your location. Dow has customer service teams, science and technology centers, application support teams, sales offices, and manufacturing sites around the globe.

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