DOWSIL™ EA-7158 Adhesive

Description

One-part, translucent, non-flowing, addition-curing silicone adhesive

Uses / Applications

- IGBT modules
- Electronic module assembly
- Power supplies and modules
- Automotive electrical housings
- Industrial and automation
- Home appliance electronics

Benefits

- Solvent free
- High strength silicone adhesive
- Fast heat cure
- Excellent primeless adhesion to many substrates

Physical Properties

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

Reference[1]	Property	Unit	Result
	One or two-part		One
CTM0176	Color		Translucent
CTM0050	Viscosity at 1 1/S	Pa.s	500
CTM0050	Viscosity at 10 1/S	Pa.s	80
CTM0044	Density	g/cm^3	1.1
CTM1098	Cure time (to > 90% final properties at 125°C)	minutes	30
CTM1098	Cure time (to > 90% final properties at 150°C)	minutes	20
CTM0091	Hardness	Shore A	35
CTM0137	Tensile strength	MPa	4.5
CTM0137	Elongation	%	260
CTM0234	Unprimed lap shear adhesion strength (PBT/PBT)	MPa	2.5
CTM0234	Unprimed lap shear adhesion strength (AL/AL)	MPa	4.0
CTM0114	Dielectric strength	kV/mm	24.0
CTM0249	Volume resistivity	ohm-cm	1.0E+15
CTM0543	Dielectric constant at 100 Hz		3.2
CTM0543	Dissipation factor at 100 Hz		0.003

1. CTM: Corporate Test Method

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Description

Dow one-part heat cure (addition-curing) adhesives cure rate are rapidly accelerated with heat (see cure schedules in table) and an optimum cure schedule will balance processing performance and costs. Addition-cure silicones are formulated with all necessary ingredients for cure and there are no by-products generated during the cure process. Deep-section or confined cures are possible as cure reactions progress evenly throughout the material. These adhesives generally have long working times so users can enjoy the greatest manufacturing flexibility and reduce waste. Dow silicone adhesives retain their original physical and electrical properties over a broad range of operating conditions which enhances the reliability of and service life of PCB system assemblies.

Processing and Application Guidelines

Application Methods

Automated or manual needle dispense.

Mixing and De-airing

Upon standing, some filler may settle to the bottom of the liquid containers after several weeks. To ensure a uniform product mix, the material in the container should be thoroughly mixed prior to use. 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 > 28 inches Hg for 10 minutes or until bubbling subsides.

Adhesion

Dow 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 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 primers can be used to increase the chemical activity on difficult substrates. Poor adhesion may be experienced on plastic or rubber substrates that are highly plasticized because the mobile plasticizers act as release agents. Small-scale laboratory evaluation of all substrates is recommended before production trials are made.

Compatibility

Certain materials, chemicals, curing agents and plasticizers can inhibit the cure of addition cure adhesives. Most notable of these include organotin and other organometallic compounds, silicone rubber containing organotin catalyst, sulfur, polysulfides, polysulfides or other sulfur containing materials, unsaturated hydrocarbon plasticizers, and some solder flux residues. If a substrate or material is questionable with respect to potentially causing inhibition of cure, it is recommended that a small-scale compatibility test be run to ascertain suitability in each application. The presence of liquid or uncured product at the interface between the questionable substrate and the cured adhesive indicates incompatibility and inhibition of cure.

Usable Life and Storage

The product should be stored in its original packaging with the cover tightly attached to avoid any contamination. Store at 0~10°C during Transportation. Store below 25°C in Plant. The product should be used by its Use Before date as indicated on the product label.

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Processing and Application Guidelines (Cont.)

Preparing Surfaces

All surfaces should be thoroughly cleaned and/or degreased with Dow OS fluids, naphtha, mineral spirits, or other suitable solvent. Solvents such as acetone or isopropyl alcohol (IPA) do not tend to remove oils well, and any oils remaining on the surface may interfere with adhesion. Light surface abrasion is recommended whenever possible, because it promotes good cleaning and increases the surface area for bonding. A final surface wipe with acetone or IPA is also useful. Some cleaning techniques may provide better results than others; users should determine the best techniques for their applications.

Substrate Testing

Due to the wide variety of substrate types and differences in substrate surface conditions, general statements on adhesion and bond strength are impossible. To ensure maximum bond strength on a particular substrate, cohesive failure of the product in a lap shear or similar test is needed to ensure 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.

Useful Temperature Ranges

For most uses, silicone adhesives should be operational over a temperature range of -45 to 200°C (-49 to 392°F). 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, 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 silicone elastomer is time and temperature dependent. As expected, the higher the temperature, the shorter the time the material will remain useable.

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.

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.

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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.

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