Technical Data Sheet

DOWSIL™ EC-6601 Electrically Conductive Adhesive

One-part electrically conductive adhesive with high elongation and stable conductivity designed for electromagnetic compatibility (EMC).

Features & Benefits

- Strong electromagnetic shielding across a wide range of frequencies
- Easy to dispense and cure at room temperature when exposed to moisture in air
- Flexible joint design enabled by greater than 150% elongation
- Unique Dow formulation enables adhesion to a variety of substrates
- Durable mechanical and conductive properties, reliable performance

Composition

- Polydimethylsiloxane
- Silver filler composition blend

Applications

- Adhesive/sealant or gasket designed for EMC solutions
- PCB grounding
- Electrical connections

Typical Properties

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

Property	Unit	Result
One or Two-part		One
Color		Tan
Initial Extrusion Rate (0.275 MPa 18 G x ½" SS Needle)	g/min	2.20
Specific Gravity (Cured)		3.37
Skin Over Time	minutes	30
Durometer Shore A		80
Tensile Strength	MPa	1.61
Elongation	%	194
Tack Adhesion	MPa	0.072
Lap Shear Adhesion (Al 5052 Substrate)	MPa	1.30
Lap Shear Adhesion (Al Clad Substrate)	MPa	1.14
Volume Resistivity	Ohm-cm	2.7E-3
Thermal Conductivity	W/m*K	2.12
Shielding Effectiveness (1 kHz-8.5 GHz), See Figure 1	dB	86

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Description

DOWSIL™ EC-6601 Electrically Conductive Adhesive is a one-part moisture cure adhesive generally cured at room temperature and in an environment of 30–80 percent relative humidity eliminating the need for curing ovens and the associated costs of energy and capital. Greater than 90 percent of full physical properties should be attained within 24 to 72 hours, and the adhesive and component can be handled in much shorter times of about 30 minutes, depending on the amount applied. The cure rate for this adhesive may be accelerated by heating to 50–65°C. These adhesives are not typically used in highly confined spaces or where a deep section cure is required as they cure from the air-exposed surface inward at a rate of about 1 mm per day. Cure progresses from the outer exposed surface and is dependent on the moisture in the air. Dow adhesives retain their original physical and electrical properties over a broad range of operating conditions which enhance the reliability and service life of electronic devices.

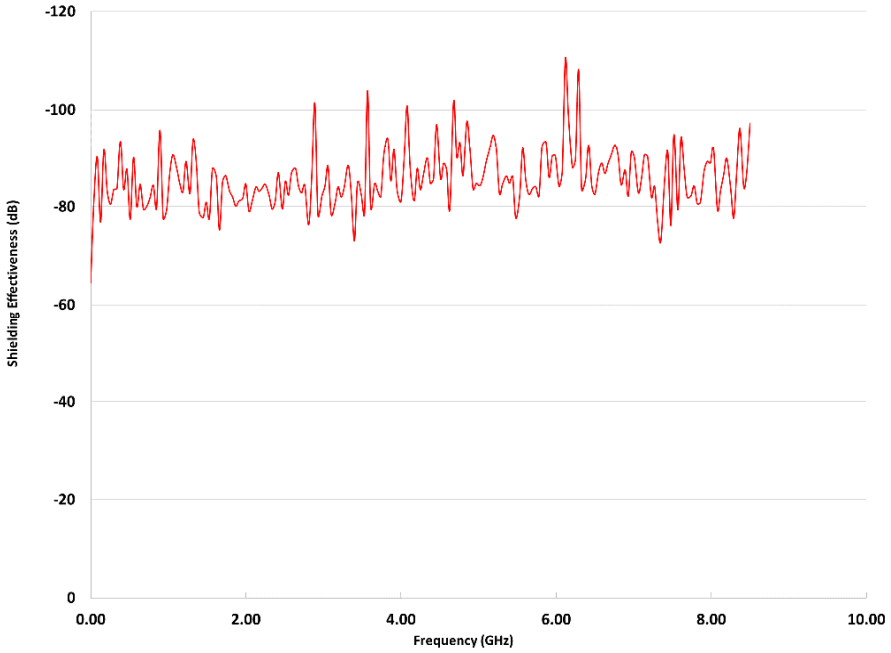


Figure 1: DOWSIL™ EC-6601 Electrically Conductive Adhesive Total Shielding Effectiveness

Substrate Preparation

All surfaces should be thoroughly cleaned and/or degreased with Dow OS fluids, naptha, mineral spirits, methyl ethyl ketone (MEK) 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 recommended. Some cleaning techniques may provide better results than others; users should determine the best techniques for their particular applications.

Substrate

Due to the wide variety of substrate types and differences in substrate surface conditions, general statements on adhesion and bond strength are impossible. A lap shear or similar test is needed to confirm the compatibility of the adhesive with the substrate being considered.

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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 PTFE, 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, since the mobile plasticizers act as release agents. Small-scale laboratory evaluation of all substrates is recommended before production trials are made.

Useful Temperature Range

For most uses, silicone adhesives should be operational over a temperature range of -45 to 125°C 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. The durability of the cured silicone is time and temperature dependent. As expected, the higher the temperature, the shorter the time the material will remain useable.

Solvent Exposure

The silicone adhesive discussed in this literature is intended only to survive splash or intermittent exposures. It is not suited for continuous solvent or fuel exposure. Testing should be done to confirm performance of the adhesives under these conditions.

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

For best results, Dow adhesives should be stored at or below the storage temperature listed on the product label. Special precautions must be taken to prevent moisture from contacting these materials. Containers should be kept tightly closed with head or air space minimized. Partially filled containers should be purged with dry air or other gases, such as nitrogen. The product should be stored in its original packaging with the cover tightly attached to avoid any contamination.

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.

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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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