Technical Data Sheet

DOWSIL™ SE 1714 Beige or Black

DOWSIL™ SE 1714 Beige or Black is a one-part, beige or black, flowable adhesive with high tensile strength

Features & Benefits

- Flowable
- Heat cure
- High tensile strength
- No added solvents
- No mixing required
- Rapid, versatile cure processing controlled by temperature
- Able to flow, fill or self-leveling after dispensing

Applications

- Sealing lids and housings for ECUs, power modules
- Fixturing PCB and system(s) assembly to circuit boards
- Reinforcing or fixing parts of connectors

Application Methods

- Automated or manual needle dispense

Typical Properties

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

Property	Unit	Result
Viscosity	cP	58800
	mPa-sec	58800
	Pa-sec	58.8
Specific Gravity (Cured)		1.30
Heat Cure Time @ 150°C	minutes	30
Tensile Strength	psi	1030
	MPa	7.1
	kg/cm^2	73
Elongation	%	230
Tensile Modulus	psi	450
	MPa	3.1
	kg/cm^2	32

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Typical Properties (Cont.)

Property	Unit	Result
Durometer Shore A (JIS[1])		66
Unprimed Adhesion - Lap Shear to Aluminum	psi	790
	MPa	5.5
	N/cm^2	548
Unprimed Adhesion - Lap Shear (Glass)	psi	810
	MPa	5.6
	N/cm^2	561
Unprimed Adhesion - Lap Shear to FR4	psi	610
	MPa	4.2
	N/cm^2	424
Unprimed Lap Shear Adhesion to PPS	psi	500
	MPa	3.5
	N/cm^2	348
Dielectric Strength (JIS K 6249)	Volts/mil	750
	kV/mm	30
Volume Resistivity (JIS K 6249)	ohm*cm	5.0 E+15
Dielectric Constant @ 1 MHz (JIS K 6249)		3.1
Dissipation Factor @ 1 MHZ (JIS K 6249)		0.0028
Thermal Conductivity	btu/hr ft degF	0.519
	W/mK	0.3
Shelf Life at 5°C	months	9

1. JIS: Japanese Industrial Standard

Description

Dow one-part heat cure (addition-curing) adhesives are typically cured at 100°C (212°F) or higher. Their cure rate is rapidly accelerated with heat (see cure schedules in table) and an optimum cure schedule will balance processing performance and costs. For thicker sections or if voiding is observed the use of a 30 minute pre-cure at 70°C (158°F) or the use of an adhesive with low-void technology may reduce voids. 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 enhance the reliability of and service life of devices. The stable chemistry and versatile processing options of these adhesives offer benefits for a variety of PCB and system(s) assembly needs from increasing component safety and reliability, reducing total cost or increasing the performance envelope of devices or modules.

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

In general, increasing the cure temperature and/or cure time will improve the ultimate 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 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. DOWSIL™ 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, polysulfones 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 a given application. The presence of liquid or uncured product at the interface between the questionable substrate and the cured gel indicates incompatibility and inhibition of cure.

Preparing Surfaces

All surfaces should be thoroughly cleaned and/or degreased with DOWSIL™ OS fluids, naphtha, 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 useful. Some cleaning techniques may provide better results than others; users should determine the best techniques for their particular 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, 100 percent cohesive failure of the adhesive in a lap shear or similar adhesive strength test is desired. This ensures compatibility of the adhesive with the substrate being considered. Also, this test can be used to determine minimum cure time or can detect the presence of surface contaminants such as mold release agents, oils, greases and oxide films.

Useful Temperature Ranges

For most uses, silicone elastomers should be operational over a temperature range of -45 to 200°C (-49 to 392°F) 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, 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.

Solvent Exposure

When liquid or vapor solvent or fuel exposure can occur in an application, the silicone adhesive discussed in this brochure 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

Dow heat-cure adhesives should be stored at or below 10°C (50°F). Containers should be kept tightly closed and kept in cold storage at all times to extend shelf life. Shelf life is indicated by the “Use Before” date found on the product label.

Packaging Information

In general, Dow adhesives/sealants are supplied in nominal 0.45, 3.6, 18 and 200 kg (1, 8, 40 and 440 lb) containers, net weight. Not all products may be available in all packages and some additional packages, such as a bladder packs or tubes, may be available for certain package sizes.

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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