Technical Data Sheet

DOWSIL™ VE-8001 Flexible Silicone Adhesive

Low temperature curable material with stable mechanical properties after a dynamic and static folding test for foldable and rollable display devices

Features & Benefits

- Good processability for a molding process and a printing process
- Stable mechanical properties after the dynamic and static folding test
- Appropriate tensile strength and elongation for small folding radius
- Low temperature cure (80°C for 1 hour at 300 um thickness)
- Long working time at room temperature (12 hours)

Applications

- Designed to have good processability for injection / transfer molding processes and screen / stencil printing processes
- Uniquely engineered to have stable properties as an elastic hinge material after a dynamic and static folding test for foldable and rollable display devices

Typical Properties

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

Test	Property	Unit	Result
	One or two-part		Two-part
	A/B mixing ratio		1:1
	Color		Black
ASTM[1] D4287	Viscosity (part A)[2]	cP Pa-sec	20,000 20
ASTM D4287	Viscosity (part B)[3]	cP Pa-sec	7,500 7.5
ASTM D4287	Viscosity (mixed)[3]	cP Pa-sec	12,500 12.5
ASTM D792	Specific gravity	g/cm^3	1.01
	Pot life (at 25°C)	hr	12
	Cure condition		80°C for 1 hr at 0.3 mmT
ASTM D2240	Hardness	Shore A	85

1. ASTM: American Society for Testing and Materials
2. HA spindle #52 at 5 rpm
3. HA spindle #52 at 10 rpm

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Typical Properties (Cont.)

Test	Property	Unit	Result
ASTM D412	Elongation	%	40
ASTM D412	Tensile strength	Mpa	12
	Linear CTE	ppm/°C	250
CTM[4] 0243	Lap shear adhesion strength[5]	psi	> 850
	(SUS to SUS / adhesion area: 25 mm X 10 mm X 0.5 mmT)	Mpa	> 5.86

4. CTM: Corporate Test Method, copies of CTM's are available on request.
5. Sandwiched SUS to SUS sample with 25 mm X 10 mm X 0.5 mmT adhesion area at 100 mm/min tensile speed

Description

DOWSIL™ VE-8001 Flexible Silicone Adhesive is a two-part, silicone-based, heat-cure material that provides stable mechanical properties after the dynamic and static folding test for foldable and rollable display devices. This product can be cured at comparatively lower temperature (80°C for 1 hour for 300 um thickness) to reach the target properties. Higher tensile strength and appropriate elongation help to control the stress neutral line for the device folding test.

Mixing and De-Airing

Dow silicone 1:1 elastic hinge materials are supplied in two parts that do not require lot matching. The 1:1 mix ratio, by weight or volume, simplifies the proportioning process. To ensure best properties Parts A and B must each be thoroughly mixed, inadequate mixing and may result in incomplete cure or reduced physical properties. Automated meter, mix and dispense equipment may be utilized. In applications or molds that are sensitive to air entrapment, de-airing or vacuum application in the mold may be helpful.

Processing/Curing

These products are compatible with commercially available equipment and industry standard processes. These materials can be pumped, meter mixed and molded similarly to liquid silicone rubber (LSR). Mix at a 1:1 ratio. They are lower in viscosity than traditional LSR materials, but they are not shear thinning as LSRs. This allows for reduced pressure in the pumping and mixing areas but similar performance in the injection unit compared to LSRs. In the mold the heat does thin the material dramatically allowing for good flow and reproduction in the mold cavity. DOWSIL™ OS fluids are recommended to clean cured or uncured silicone residue from application equipment.

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 a solid elastoplastic material. Pot life is defined as the time required for viscosity to double after Parts A and B (base and curing agent) are mixed and is highly temperature dependent. Please refer to the data table. The cure time depends on the thickness and the cure temperature used.

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 and should be adequately tested for the particular end use environment. 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.

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 material indicates incompatibility and inhibition of cure.

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.

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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