Technical Data Sheet

DOWSIL™ 6-1104 Controlled Volatility Sealant

One-part, translucent, nonflow space grade adhesive

Features & Benefits

- Non-flowing
- Room temp cure
- Low levels of volatile condensable materials
- High elongation for added stress relief
- No mixing required
- RT cure, no ovens required
- Faster in-line processing with optional heat acceleration
- Proven for Space-Grade Applications

Applications

- Space-grade sealing and adhering

Application Methods

- Automated or manual needle dispense systems

Typical Properties

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

Property	Unit	Result
Extrusion Rate	g/min	164
Skin Over Time at 25°C	minutes	26
Tack-Free Time at 25°C	minutes	64
Specific Gravity (Cured)		1.1
Refractive Index		1.41
Tensile Strength	psi MPa kg/cm^2	925 6.4 64
Elongation	%	610
Tensile Modulus	psi MPa kg/cm^2	140 1 10
Tear Strength (Die B)	ppi N/cm	180 125

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Typical Properties (Cont.)

Property	Unit	Result
Durometer Shore A		41
Unprimed Adhesion - Lap Shear to Aluminum	psi	220
	MPa	1.5
	N/cm^2	150
Unprimed Adhesion - 180 Degree Peel Strength	ppi	27
	N/cm^2	18.5
Dielectric Strength	volts/mil	550
	kV/mm	21
Volume Resistivity	ohm*cm	1.37 E+15
Dielectric Constant at 100 Hz		2.59
Dielectric Constant at 100 kHz		2.58
Dissipation Factor at 100 hz		0.00035
Dissipation Factor at 100 kHz		< 0.00017
Thermal Conductivity	btu/hr ft degF	0.346
	W/mK	0.2
Shelf Life at 25°C	months	12
Primed Adhesion - Lap Shear on Aluminum	psi	510
	MPa	3.5
	N/cm^2	35
Primed Adhesion - 180 Degree Peel Strength	ppi	99
	N/cm^2	68.2
	kg/cm^2	6.8
Total Mass Loss (ASTM[1] E595)	%	0.77
Volatile Condensable Material (ASTM E595)	%	0.027

1. ASTM: American Society for Testing and Materials

Description

Dow one-part moisture cure adhesives are generally cured at room temperature and in an environment of 30 to 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 varies according to product. Faster manufacturing throughout is achieved however since the adhesive and component can be handled in much shorter times of about 10 to 120 minutes depending on the adhesive selected and the amount of applied. These adhesives are not typically used in highly confined spaces or where a deep section cure is required as they generally cure from the exposed surface inward at a rate of 0.25 inch per seven days. Cure progresses from the outer exposed surface and is dependent on the moisture in the air. Working time is generally a few minutes to an hour for these products until a surface skin begins to form. Mild heat below 60°C (140°F) may be used to increase through-put by accelerating the cure. 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 PCB systems assemblies. The stable chemistry and versatile processing options of these adhesives offer benefits for a variety of needs from increasing component safety and reliability, reducing total cost or increasing the performance envelope of devices or modules.

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Packaging Information

RTV Adhesives are typically packaged in 100 ml syringes and 330 ml cartridges, 1 kg tubs and pails (18–25 kg). 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.

Usable Life And Storage

For best results, Dow RTV adhesives should be stored at or below 25°C (77°F). 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. Shelf life is indicated by the "Use Before" date found on the product label.

Preparing Surfaces

All surfaces should be thoroughly cleaned and/or degreased with Dow 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.

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. 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.

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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.

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, www.consumer.dow.com or consult your local Dow representative.

Limitations

This product is neither tested nor represented as suitable for medical or pharmaceutical uses.

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

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 **www.consumer.dow.com**.

To discuss how we could work together to meet your specific needs, go to **www.consumer.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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