



## Technical Data Sheet

# DOWSIL™ 3-1953 Conformal Coating

### FEATURES & BENEFITS

- Solventless elastomeric formulation
- Room temperature cure
- Mild heat acceleration can speed in-line processing
- Good adhesion to many substrates
- Soft coating
- UV indicator
- UL, IPC and Mil Spec qualified
- No ovens required
- Allows use with many low-solids no-lead solder
- Improves reliability against stress
- Easy inspection under UV light
- Use in applications requiring multiple reliability industry standards

### COMPOSITION

- Polydimethylsiloxane coating

Medium viscosity coating, UL, IPC and Mil Spec approved

### APPLICATIONS

- DOWSIL™ 3-1953 Conformal Coating is a solventless, elastomeric coating suitable for lighting, industrial and automotive industries requiring various reliability standards as a coating for rigid and flexible circuit boards, sensitive components and fine pitched designs.

### TYPICAL PROPERTIES

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

Property	Unit	Result
One or Two-part		One
Color		Translucent
Viscosity	cP	350
	mPa-sec	350
	Pa-sec	0.4
Specific Gravity (Cured)		0.98
NVC (Non Volatile Content)	%	99.4
Tack-Free Time at 25°C	minutes	8
Tack-Free Time at 60°C/15% RH	minutes	0.5
Tensile Strength	psi	80
	MPa	0.5
	kg/cm <sup>2</sup>	5
Elongation	%	60
Durometer Shore A		34
Dielectric Strength (JIS K 6249)	Volts/mil	425
	kV/mm	17
Volume Resistivity (JIS K 6249)	ohm*cm	5.5 E15
Dissipation Factor at 100 Hz		0.0007
Dissipation Factor at 100 kHz		< 0.0002
Hardening Transition by DSC	°F	-56.2
	°C	-49

## DESCRIPTION

Solventless RTV elastomeric conformal coatings require atmospheric moisture to cure, needing no expensive ovens, and various viscosity versions facilitate different application methods. This family of coatings is rapidly gaining popularity due to its solventless formulations, its rapid cure rates that can be dramatically accelerated by mild heat, and its cost effectiveness. These elastomers, when cured, offer the optimum stress relief for even the most delicate components and interconnections in a variety of service environments. This product line also features coatings manufactured for controlled volatility and many of these products are UL recognized. Conformal coatings are materials applied in thin layers onto printed circuits or other substrates.

## APPLICATION METHODS

- Spray
- Brush
- Flow
- Automated pattern coating
- May be dip coated with special precautions

## PROCESSING/CURING

Time to cure is dependent on several variables including the method of application, film thickness, temperature and humidity. Tack-free time in the data table gives an indication of typical times until surface is dry enough to handle. Cure time for full cure are indications of time needed to develop full physical properties such as durometer, tensile strength or adhesion. These times, including full cure time, can be significantly improved by introducing mild heat of 60°C or less.

## POT LIFE AND CURE RATE

The pot life of Dow RTV conformal coatings is dependent on the application method chosen. To extend pot life, minimize exposure to ambient moisture by using dry air or

## TYPICAL PROPERTIES (Continued)

Property	Unit	Result
UL Flammability Classification	NA	94 V-0
Mil Specification	NA	Mil I-46058C Amend 7
Agency Listing		IPC-CC-830A with Amendment 1, UL 746E
Cyclotetrasiloxane (D4) content	%	< 0.1

dry nitrogen blanketing whenever possible.

## ADHESION

With RTV cure coatings, adhesion typically lags behind cure and may take up to 72 hours at room temperature to build in some coatings. Dow conformal coatings are formulated to provide adhesion to most common substrates and materials. It is recommended that the coatings be applied to clean and dry substrates prior to application. Due to the vast variety of substrates used appropriate adhesion testing should be performed to insure the adhesion of the coating is adequate for the end use and should only be tested after 72 hours at room temperature. On certain difficult, low-surface energy surfaces, adhesion may be improved by priming or by special surface treatment such as chemical or plasma etching.

## USABLE LIFE AND STORAGE

Special precautions must be taken to prevent moisture from contacting Dow RTV conformal coatings. Containers should be kept tightly closed and 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. Store in accordance with any special instructions listed on the product label. The product should be used by its Use Before date as indicated on the product label.

## USEFUL TEMPERATURE RANGES

For most uses, silicone adhesives 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.

## REPAIRABILITY

In the manufacture of PCB system assemblies, it is often desirable to salvage or reclaim damaged or defective units. Dow RTV conformal coatings offer excellent reparability because they can be removed from substrates and circuitry by scraping or cutting, or by using solvents or stripping agents. If only one circuit component is to be replaced, a soldering iron may be applied directly through the coating to remove the component. Proper ventilation of any fumes should be employed. After the

circuit board has been repaired, the area should be cleaned by brushing or by using solvent, then dried and recoated. Heat cure coatings can be repaired with RTV coatings, but heat cure coatings may not work well when used to repair RTV coatings.

## **PACKAGING INFORMATION**

Multiple packaging sizes are available for this product.

## **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.**

## **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, [www.consumer.dow.com](http://www.consumer.dow.com) or consult your local Dow representative.

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To discuss how we could work together to meet your specific needs, go to [www.consumer.dow.com](http://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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