

## Conformal Coatings

# Dow Corning® 1-4105 Conformal Coating

### FEATURES

- Low viscosity
- Heat cure
- Cures to soft, low stress elastomer
- No added solvents
- UV indicator for inspection
- UL V-1 flammability rating

### BENEFITS

- Rapid, versatile cure processing controlled by temperature
- Good adhesion allows use with many low-solids (no clean) and no-lead solders
- Low viscosity enhances flow and fill in narrow gaps and spaces
- UV indicator allows for automated inspection

### POTENTIAL USES

- Protective coating for rigid and flexible circuit boards

### APPLICATION METHODS

- Dip
- Spray
- Brush
- Flow
- Automated pattern coating

### 1-part, transparent low viscosity conformal coating

### TYPICAL PROPERTIES

Specification Writers: Please contact your local Dow Corning sales office or your Global Dow Corning Connection before writing specifications on this product.

Property	Unit	Value
Viscosity	cP	450
	mPa-sec	450
	Pa-sec	0.5
Specific Gravity (Cured)	-	0.97
Heat Cure Time @ 100°C	minutes	5
Durometer Shore 00	-	64
Dielectric Strength	volts/mil	500
	kV/mm	20
Volume Resistivity	ohm*cm	2.7 E+13
Dielectric Constant at 100 Hz	-	2.63
Dielectric Constant at 100 kHz	-	2.63
Dissipation Factor at 100 hz	-	0.0007
Dissipation Factor at 100 kHz	-	<0.0002
Shelf Life at 5°C	months	7
Agency Listing	-	UL746E
UL Flammability Classification	NA	94 V-1

## DESCRIPTION

Solventless heat cure conformal coatings are designed for rapid processing at low temps (below 125°C). They require some heating to cure, offering long bath at room temperature. Like the room-temperature-curing elastomers, these products offer optimum stress relief to surface mount and fine pitch components and interconnections in a variety of service environments. This product line also features coatings that are Mil Spec, IPC-CC-830 and UL recognized. Conformal coatings are materials applied in thin layers (typically a few mils or microns) onto printed circuits or other electronic substrates. They provide proven, cost effective environmental and mechanical protection to significantly extend the life of the components and circuitry.

## PROCESSING/CURING

Time to cure is dependent on film thickness, type of oven, and board population density. Heat cure time in the Typical Properties table gives an indication of typical times after the coating is heated to the temperature indicated. Highly populated, large, heavy boards may take longer than the indicated times due to the large thermal mass taking extra time to warm.

## POT LIFE AND CURE RATE

The pot life of Dow Corning Heat Cure Conformal Coatings is also dependent on the conditions in which they are processed, but is typically greater than 2 months. Dip tanks or containers should be closed and sealed when not in use. To maximize pot life, tank temperatures should be maintained at less than 29°C (85°F).

## ADHESION

With heat cure coatings, the adhesion is complete with the full cure time and temperature. Dow Corning Conformal Coatings are formulated to provide adhesion to most common electronic substrates and materials. On certain difficult, low-surface

energy surfaces, adhesion may be improved by priming or by special surface treatment such as chemical or plasma etching.

## 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 simple 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.

## 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.

## REPAIRABILITY

In the manufacture of electronic devices, it is often desirable to salvage or reclaim damaged or defective units. Dow Corning Conformal Coatings offer excellent repairability 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. 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

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

## STORAGE AND SHELF LIFE

Shelf life is indicated by the "Use Before" date found on the product label.

## HEALTH AND ENVIRONMENTAL INFORMATION

To support customers in their product safety needs, Dow Corning has an extensive Product Stewardship organization and a team of Product Safety and Regulatory Compliance (PS&RC) specialists available in each area. For further information, please see our website, [www.dowcorning.com](http://www.dowcorning.com), or consult your local Dow Corning representative.

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