Technical Data Sheet

DOWSIL™ CC-4555 Long Bath Life Conformal Coating

One-part, translucent, low viscosity; fast, low-temperature cure; no added solvent; long bath life for applications requiring a long room temperature working time

Features & Benefits

- Cures to soft, low stress elastomer
- Rapid, versatile cure processing controlled by temperature
- Long bath life reduces need for equipment purging/clean-up
- Can be re-circulated and reclaimed
- UV indicator allows for automated inspection
- Resists humidity and other harsh environmental factors such as thermal shock and vibration
- UL V-0
- Provides stress relief
- Heat cure
- Long bath life

Composition

- One part

Applications

- DOWSIL™ CC-4555 Long Bath Life Conformal Coating is suitable for protective coating for rigid and flexible circuit boards, Printed Wiring Board (PWB), sensitive components and fine pitch designs.

Typical Properties

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

Property	Unit	Result
One or Two-part		One
Color (Cured)		Translucent (Clear)
Viscosity	cP	225
Specific Gravity (Uncured)		0.97
Specific Gravity (Cured)		0.98
Tack-Free Time at 120°C	minutes	4
Refractive Index		1.41
Durometer Shore A		22
Durometer Shore 00		78

Typical Properties (Cont.)

Property	Unit	Result
Tensile Strength	psi	60
	MPa	0.4
	kg/cm^2	4
Elongation	%	25
Tensile Modulus	psi	250
	MPa	1.7
	kg/cm^2	17
Dielectric Strength	volts/mil	540
	kV/mm	21.6
Volume Resistivity	ohm*cm	4.04E+13
Dielectric Constant at 100 Hz		2.70
Dielectric Constant at 100 kHz		2.69
Dielectric Constant at 1 MHz		2.69
Dielectric Constant at 24 MHz		2.71
Dissipation Factor at 100 Hz		< 0.0002
Dissipation Factor at 100 kHz		0.0001
Dissipation Factor at 1 MHz		0.0002
Dissipation Factor at 24 MHz		0.0037
UL Flammability Classification	NA	UL V-0
Non-Volatile Content (NVC)	%	99.6

Description

Solventless heat cure conformal coatings are designed for rapid processing at low temperatures (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-I-46058C and IPC-CC-830 qualified and UL recognized. Conformal coatings are materials applied in thin layers onto printed circuits or other PCB system assembly substrates.

Application Methods

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

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 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 conformal coatings are formulated to provide adhesion to most common PCB system assembly substrates and materials. It is recommended that the coatings be applied to clean and dry substrates prior to application. 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 after the recommended cure cycle at the interface between the questionable substrate and the cured gel indicates incompatibility and inhibition of cure.

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 assembly devices, 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 fume 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.

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

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.

In some cases depending on storage, there may be a hazy appearance noticed in the containers when first opened, even though they are considered clear conformal coatings. It is normal for this to occur especially if the container has been sitting stagnant for several days or weeks. This is due to the solubility of the phenyl resin in the solvent and how long the container has been sitting in storage. The coating should cure to a clear consistency regardless of this initial appearance. Mild agitation can reconstitute the material so it is consistent in appearance and viscosity. Care should be taken if the low VOC versions are in bladder bags. A gentle rolling of the pail should correct the problem and redistribute the solvent. This should be performed 24 hours before use, so any induced bubbles from the manual agitation or rolling process have a chance to dissipate.

Packaging Information

Multiple packaging sizes are available for this product. Please contact your local distributor or Dow representative for information on packaging size and availability.

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

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.

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