Acrylic Conformal Coating
Technical Data Sheet

5103-Liquid

Description

Our 5103 *Acrylic Conformal Coating* is a fast drying, xylene and toluene free product that provides an excellent finish. It is ideal for high moisture environments and applications requiring easy repair and rework.

The 5103 coating protects electric circuits against moisture, dirt, dust, and thermal shocks that could corrode, short circuit, or otherwise damage the electric components. It insulates against high-voltage arcing, shorts, and static discharges. As well, this coating provides a high dielectric withstand voltage that allows traces to be put closer together helping with miniaturization.

Applications & Usages

The 5103 coating improves reliability, operational range, and lengthens the life of electrical and electronic components and assemblies. Its primary applications are in the automobile, marine, aerospace, aviation, communication, instrumentation, industrial control equipment, and consumer electronics industries.

Common acrylic conformal coatings uses are with electric generators, motors, transformers, relays, and air bag controllers. The 0209 coating can serve to protect high technology devices like cell phones, computer tablets, avionics, and more.

Benefits and Features

- **Super fast cure**—tack free in about 3 min; full cure in <30 min at 65 °C [149 °F]
- **Protects electronics from** moisture, corrosion, fungus, and static discharges
- **No Hazardous Air Pollutants**—free of toluene or xylene • VOC of only 67% • free of ozone depletion compounds • coating is RoHS compliant
- **Excellent finish**—smooth, homogeneous, and durable crystal clear coat
- **Easy to inspect**—fluoresces under UV light
- **Easy rework and repairs**—can solder through coat • removable with thinner or stripper

Curing & Work Schedule

Properties	*Value*
Tack Free Recoat Time	3-5 minutes 2 minutes
Full Cure[a)] @25 °C [77 °F] Full Cure[a)] @65 °C [149 °F]	24 hours 30 minutes

a) Cure times assume a minimum thickness of 1 mil and standard conditions.

Service Ranges

Properties	*Value*
Service Temperature	-65 to +125 °C [-85 to +257 °F]
Max Coverage[b)] per 1L for 25 μm [1 mil]	<63 000 cm^2 [<67.8 ft^2]

b) Estimated based on ideal values. Actual value will be somewhat less than quoted.

Rev. Date: 29 June 2012 / Ver. 1.04

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Chemical Components

Name	***CAS Number***
Acrylic Resin	*proprietary*
Ethyl Acetate	*141-78-6*
Acetone	*67-64-1*
N-Heptane	*142-82-5*
PM Acetate [PGMEA]	*108-65-6*

Properties of Cured

Physical Properties	***Method***	***Value***
Color	Visual	Crystal Clear
Solderability	—	Excellent
Weather Resistance	—	Excellent
Fungus Resistance	IPC-TM-650 2.6.1.1	Excellent
Flexibility	IPC-TM-650 2.4.5.1	Excellent
Electric Properties	***Method***	***Value***
Dielectric Withstand Voltage	per IPC-TM-650	>1500 V
Insulation Resistance (after 24 hours)	IPC-TM-650 Test 2.6.3.4	$5x10^{12}$ Ω
Environmental & Ageing Study	***Method***	***Value***
Salt Spray Test: 7 day @35 °C +Salt/Fog	ASTM B117-2011	
Cross-hatch adhesion	ASTM D3359-2009	5B = 0% area removed
Cracking, unwashed area	ASTM D661-93	None
Visual Color, unwashed area	ASTM D1729-96	No change
Peeling, unwashed area	ASTM D1729-96	None

Properties of Uncured

Physical Property	***Method***	***Value***
Odor	—	Ether-like, gasoline and minty
Viscosity at 23 °C [73 °F]	Brookfield SP1	7.2 cP [0.0072 Pa·s]
Density	MIL-STD-45662A	0.874 g/ml
Flash Point	Closed Cup	-19 °C [-2.2 °F]
Boiling Point		≥66 °C [≥150 °F]
Solids Content (w/w)		16.7%

Compatibility

The 5103 acrylic coating is compatible with most materials found on printed circuit assemblies; however, in an uncured state it is not compatible with contaminants like water, oil, and greasy flux residues. Therefore, it is extremely important to clean the printed circuit assembly thoroughly with a suitable electronic cleaner before applying the coating.

The chosen electronic cleaner should remove moisture, wax, greases, oils, and all other contaminants that are known to cause defects in this type of conformal coating. (See recommended cleaners on page 5.)

Health, Safety, and Environmental Awareness

Please see the 5103-Liquid **Material Safety Data Sheet** (MSDS) for more details on transportation, storage, handling and other security guidelines.

Environmental Impact: The 5103 formulation is designed to be environmentally friendly. It is free from ozone depletion compounds or toxic solvents. After dilution with Thinner Cleaner, the regulated VOC drops to 38.8% (~350 g/L). The coating is RoHS compliant.

Health and Safety: The aerosol is flammable and should be kept away from flames and other ignition sources. As with most paint materials, avoid breathing in fumes or direct contact with the material. Solvents therein can cause irritation and other symptoms like headaches, pain, as well as having long term exposure effects.

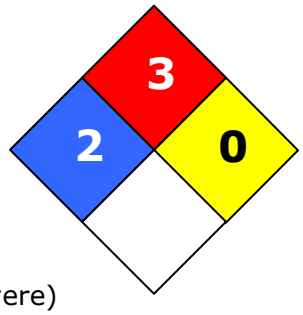
Wear safety glasses and disposable gloves. Wash hands thoroughly after use. Use in the open air, in fume hoods, or in well ventilated area. For short or long term (8 hours) at levels of exposures exceeding 500 ppm n-heptane or 750 ppm acetone, use NIOSH approved respirator with organic vapor cartridges rated for this order of concentrations.

The cured coating presents no known hazard.

HMIS® RATING

HEALTH:	**2**
FLAMMABILITY:	**3**
PHYSICAL HAZARD:	**0**
PERSONAL PROTECTION:	

NFPA® 704 CODES



Approximate HMIS and NFPA Risk Ratings Legend:
0 (Low or none); 1 (Slight); 2 (Moderate); 3 (Serious); 4 (Severe)

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Spray Gun Application Instructions

Follow the procedure below for best results.

To apply the required thickness by weight

1. Mix thoroughly, and spray a test pattern. This step ensures good flow quality and helps establish appropriate distance to avoid runs.
2. At a distance of 20 to 25 cm (8 to 10 inches), hold the gun at around 45°, and spray a thin and even coat onto the horizontal board. For best results, use spray-and-release strokes with an even motion to avoid excess paint in one spot.
3. Before the next coat, rotate the board 90° to ensure good coverage.
4. Wait at least 2 minutes, and spray another coat. The delay avoids trapping solvent between coats.
5. Apply other coats until desired thickness is achieved. (Go to Step 3)
6. Let dry for 3-5 minutes (flash off time) at room temperature.

To cure the conformal coating

Full cure can be achieved in less than 30 minutes by using an infrared lamp or in convection oven at 65 °C [149 °F]. At room temperature, the coat dries to the touch in 3-5 minutes. And full cure takes about 24 hours.

The procedure above is based on a minimum thickness of 25 μm (1 mil) conformal coating. After full cure, measure the actual conformal coating thickness to ensure it meets the applications requirements.

Packaging and Supporting Products

Product Availability

Cat. No.	Form	Net Volume	Net Weight	Shipping Weight
5103-1L	Liquid	950 mL 1 qt	0.8 kg 1.8 lb	5.5 kg 11.5 lb (×5) [b]
5103-4L	Liquid	3.8 L 1 gal	3.3 kg 7.3 lb	3.8 kg 8.3 lb
5103-20L	Liquid	19 L 5 gal	16.6 kg 36.5 lb	19 kg 42 lb
Contact MG Chemicals if custom packaging or sizes are required				

a) Pack of ten cans
b) Pack of five bottles

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Technical Support

Contact us regarding any questions, improvement suggestions, or problems with this product. Application notes, instructions, and FAQs are located at www.besttec.us .

Email: support@besttec.us

Phone: 1-269-657-8313
Fax: 1-269-657-8313

Warranty

Besttec Chemical Ltd. warranties this product for 12 months from the date of purchase by the end use r. *Besttec Chemical Ltd.* makes no claims as to shelf life of this product for the warranty. The liability of *Besttec Chemical Ltd.* whether based on its warranty, contracts, or otherwise shall in no case include incidental or consequential damage.

Disclaimer

This information is believed to be accurate. It is intended for professional end users having the skills to evaluate and use the data properly. *Besttec Chemical Ltd.* does not guarantee the accuracy of the data and assumes no liability in connection with damages incurred while using it.

Appendix A

Standards Qualification

Qualification Criteria	*Test Method*	*Results*
Qualified IPC-CC-830B*		
Appearance	IPC-CC-830B 3.5.2	pass
Fluorescence	IPC-CC-830B 3.5.3	pass
Flammability	IPC-CC-830B 3.5.6	pass
Fungus Resistance	IPC-TM-650 2.6.1.1	pass
Flexibility	IPC-TM-650 2.4.5.1	pass
Dielectric Withstand Voltage	IPC-TM-650 2.5.7.1	pass
Moisture and Insulation Resistance	IPC-TM-650 2.6.3.4	pass
Thermal Shock	IPC-TM-650 2.6.7.1	pass
Temperature Humidity Aging	IPC-TM-650 2.6.11.1	pass

*Qualified independently by Pacific Testing Laboratories, Inc.