

Description

Our 419D *Premium Acrylic Conformal Coating* is an IPC-CC-830B and UL 94-V0 certified, fast drying, xylene and toluene free product that provides an excellent finish. This one part coating is easy to use and repair. It does not require special or costly equipment or materials. It is ideal for high moisture environments and applications requiring easy repair and rework.

The 419D coating protects electric circuits against moisture, dirt, dust, thermal shocks, and scratches 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 419D 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 419D coating can serve to protect high technology devices like cell phones, computer tablets, avionics, and more.

Benefits

- **No hazardous air pollutants**—free of toluene or xylene
- **Certified *UL 94V-0*** (File # [E203094](#))
- **Externally qualified** to *IPC-CC-830B*-class B, by Pacific Testing Laboratories
- **Excellent finish**—smooth, homogeneous, and durable crystal clear coat
- **Protects electronics from** moisture, corrosion, fungus, and static discharges
- **Easy to inspect**—fluoresces under black light (UV light)
- **Easy rework and repairs**—can solder through coat • removable with Cat. No. 435, 4352 thinner or Cat. No. 8312 stripper

Usage Parameters

<i>Properties</i>	<i>Value</i>
Tack Free	10 to 15 min
Recoat time	2 to 3 min
Drying Time @22 °C [72 °F]	24 h
Drying Time @65 °C [149 °F]	60 min
Shelf Life	3 y
Theoretical Coverage per 340 g can ^{a)}	≤10 500 cm ² [≤1 620 in ²]

a) Idealized estimate based on a coat thickness of 25 µm [1.0 mil] and 50% transfer efficiency.

Temperature Ranges

<i>Properties</i>	<i>Value</i>
Constant Service Temperature	-65 to 125 °C [-85 to 257 °F]
Storage Temperature Limits	-5 to 40 °C [23 to 104 °F]

Chemical Components

Name	CAS Number
Dimethyl ether	115-10-6
N-butyl acetate	123-86-4
Methyl Ethyl Ketone (MEK)	78-93-3
1-Methoxy-2-propanol acetate	108-65-6
Methyl methacrylate	80-62-6
N-butyl methacrylate	97-88-1

Properties of Cured 419D

<i>Physical Properties</i>	<i>Method</i>	<i>Value</i>
Color	Visual	Crystal Clear
Solderability	—	Excellent
Weather Resistance	—	Excellent
Fungus Resistance	IPC-TM-650 2.6.1.1	Pass
Flexibility	IPC-TM-650 2.4.5.1	Pass
Flammability	UL registered E203094	94V-0
<i>Electrical Properties</i>	<i>Method</i>	<i>Value</i>
Breakdown Voltage @0.7 mil	ASTM D 149	700 V 0.7 kV
Dielectric Strength @0.7 mil	"	1 000 V/mil 0.04 kV/mm
Dielectric Withstand Voltage	per IPC-TM-650	>1 500 V
Insulation Resistance (after 24 hours)	IPC-TM-650 Test 2.6.3.4	1 × 10 ¹² Ω
<i>Thermal Properties</i>	<i>Method</i>	<i>Value</i>
Glass Transition Temperature (T _g)	ASTM E 831	44 °C [111 °F]
CTE ^{c)} prior T _g	"	72 ppm/°C

Note: See Appendix A for UL 94V-0 and IPC-CC-830B standards test results.

Properties of Uncured 419D

<i>Physical Properties</i>	<i>Method</i>	<i>Value</i>
Odor	—	Ester-like, fruity
Viscosity @25 °C [77 °F]	Brookfield SP1	110 mm ² /s
Density	ASTM D 1475	0.91 g/ml
Flash Point	Closed Cup	9 °C [48 °F]
Boiling Point		≥80 °C [≥176 °F]
Solids Content (w/w)		13.2%

Compatibility

The 419D 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 3).

Health, Safety, and Environmental Awareness

Please see the 419D-Liquid **Safety Data Sheet** (SDS) for more details on transportation, storage, handling and other security guidelines.

Environmental Impact: The volatile organic content is 87% (794 g/L) by EPA and WHMIS standards.



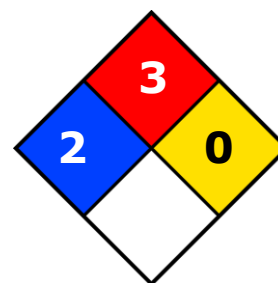
This product meets the European Directive 2011/65/EU Annex II (ROHS); recasting 2002/95/EC.

Health and Safety: The liquid and spray 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.

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)

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 of 150 ppm butyl acetate or 200 ppm MEK, use NIOSH approved respirator with organic vapor cartridges rated for this order of concentrations.

The cured coating presents no known hazard.

Aerosol Application Instructions

Follow the procedure below for best results. Each coat results in a dry film thickness of roughly 0.5 mil [13 μm].

Prerequisites

- Ensure surface to be coated is oil free, dust free and clean

Material & Equipment

- Personal protection equipment (See 419D-Aerosol SDS)

To apply the required thickness by weight

1. Shake the can vigorously, 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), spray a thin and even coat onto a vertical surface.
For best results, start your movement off-surface, press the trigger, and only release off-surface at the end of the stroke. Use a uniform movement of the spray gun parallel to the surface.
3. Before the next coat, rotate the board 90° to ensure good coverage.
4. Wait at least 5 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 15 minutes (flash off time) at room temperature.

ATTENTION!

- Holding the can at a non-vertical angle during the spray application may result in uneven application.
- Coats that are applied too thick cause runs and hamper solvent evaporation.
- Spraying onto horizontal surfaces is not recommended.

After use, clear the nozzle of the aerosol

1. Invert the aerosol can upside down.
2. Press button until clear propellant comes out. The propellant should become clear in a few seconds.

To cure the conformal coating

Full cure can be achieved in 60 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 15 minutes and fully cured in 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

<i>Cat. No.</i>	<i>Packaging</i>	<i>Net Volume</i>		<i>Net Weight</i>		<i>Packaging Weight</i>	
419D-340G	Aerosol	410 mL	13.9 fl oz	340 g	12 oz	TBD	TBD
419D-1L	Can	945 mL	31.9 fl oz	0.8 kg	1.9 lb	1.0 kg	2.5 lb
419D-4L	Can	3.78 L	1 gal	3.4 kg	7.6 lb	4 kg	9 lb
419D-20L	Can	18.9 L	5 gal	17 kg	38 lb	20 kg	9 lb

TBD = To be determined

Thinners & Conformal Coating Removers

- *Thinner 2*: Cat. No. 4352-945ML, 4352-4L (1 gal), 4352-20L, 4352-200L
- *Conformal Coating Stripper—Liquid*: Cat. No. 8312-580ML, 8312-3.78L

Technical Support

Contact us regarding any questions, suggestions for improvements, or problems with this product. Application notes, instructions and FAQs are located at www.mgchemicals.com.

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Warranty

M.G. Chemicals Ltd. warrants this product for 12 months from the date of purchase by the end user. *M.G. Chemicals Ltd.* makes no claims as to shelf life of this product for the warranty. The liability of *M.G. Chemicals 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 who have the skills required to evaluate and use the data properly. *M.G. Chemicals 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

Certified UL 94V-0 and IPC-CC-830B qualified.

<i>Qualification Criteria</i>	<i>Test Method</i>	<i>Results</i>
UL 94V-0		
Coating flammability	UL 94V (File # E203094)	94V-0
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 (Optional)	IPC-TM-650 2.6.11.1	pass

Note: All tests passed; this product thus meets the full IPC-CC-830B Class B requirements.

*Qualified independently by Pacific Testing Laboratories, Inc.