Acrylic Conformal Coating
419C Technical Data Sheet

Description

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

The 419C coating protects electric circuit against moisture, dirt, dust, and thermal shocks that could corrode, short circuit, or damage the electric component. 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 which helps with miniaturization.

Applications & Usages

The 419C coating improves reliability, operational range, and lengthens the life of electrical components and assemblies. Its primary applications are in the automobile, marine, aerospace, aviation, communication, instrumentation, industrial control equipment, and consumer electronics industries.

Some common uses of acrylic conformal coatings are for electric generators, motors, transformers, relays, and air bag controllers. The 419C coating can serve to protect high technology devices like cell phones, computer tablets, avionics, and more.

Benefits and Features

- **Certified *UL 94V-0*** (File # E203094)
- **Externally Qualified** to ***IPC-CC-830B*** by Pacific Testing Laboratories
- **Super fast cure**—tack free in about 3 min; dries 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 68% • 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 435 thinner or 8310 stripper

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Usage Parameters

Properties	*Value*
Tack Free	3 to 5 min
Recoat Time	2 min
Drying Time @25 °C [77 °F]	24 h
Drying Time @65 °C [149 °F]	30 min
Shelf Life	5 y
Theoretical 340G Spray Can Coverage [a)]	≤5 700 cm^2 ≤880 in^2 ≤6 ft^2

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

Temperature Ranges

Properties	*Value*
Constant Service Temperature	-65 to 125 °C [-85 to 257 °F]
Storage Temperature Limits [b)]	-5 to 40 °C [23 to 104 °F]

b) The product must stay within the storage temperature limits stated. ATTENTION! Aerosol container will be crushed at ≤-26.5 °C [≤15.7 °F].

Principal Components

Name	***CAS Number***
Ethyl acetate	*141-78-6*
Acetone	*67-64-1*
Propane	*74-98-6*

Properties of Cured 419C

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
Flammability	UL registered	94V-0
Electrical Properties	***Method***	***Value***
Dielectric Withstand Voltage	per IPC-TM-650	>1 500 V
Insulation Resistance (after 24 hours)	IPC-TM-650 Test 2.6.3.4	5 x 10^{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

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

Properties of Uncured 419C

Physical Property	*Method*	*Value*
Odor	—	Ethereal
Viscosity @23 °C [73 °F]	Brookfield SP1	≥7 cP [≥0.007 Pa·s]
Density	MIL-STD-45662A	0.87 g/mL
Flash Point	Closed Cup	-17 °C [1.4 °F]
Boiling Point		≥56 °C [≥133 °F]
Solids Content [a)] (w/w)		16.7%

a) Solids percentage with respect to the liquid—without propellant contribution.

Compatibility

The 419C acrylic coating is compatible with most material 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).

419C Adherence Compatibility

Substrate	*Note*
Acrylonitrile Butadiene Styrene (ABS)	Chemically etches [a)] and adheres well to this substrate.
Polybutlylene Terephtalate (PBT)	"
Polycarbonate	"
Polyvinyl Acetate (PVA)	"
Acrylics or Acrylic Paints	Adheres well to clean surface
Copper, Lead, Tin	"
Epoxy, FR4 substrate	"
Polyurethane	Adheres well to clean surface for most urethane types
Wood	Adheres well with surface preparation

a) Etching is similar to sanding, except that it also softens the surface helping to meld the paint to the plastic for superior adhesion.

ATTENTION! Do not use on thin plastics or on plastics where you want to keep original surface intact. The 419C spray contains a controlled amount of solvents designed to chemically etch plastic surfaces to help adhesion by melding the acrylic coating into the plastic substrate. This prevents flaking or peeling. Using the 4351-1L thinner lessens the etching effects for chemically sensitive substrates.

Storage

Store between -5 and 40 °C [23 and 104 °F] in dry area away from sunlight. Temperatures below or above these outer limits will result in the container being crushed and/or ruptured.

Health, Safety, and Environmental Awareness

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

Environmental Impact: The VOC (Volatile Organic Compound) content is 40% (381 g/L) by EPA and WHMIS standards.

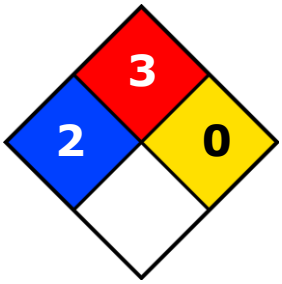
This product meets the European Directive
2011/65/EU Annex II (ROHS);
recasting 2002/95/EC.

Health and Safety: The solvents in 419C can ignite if exposed to flames or sparks and can cause respiratory track irritation. If ignited, then flame flash back is possible. Use in well-ventilated area. Wear safety glasses or goggles and disposable gloves to avoid exposures.

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)

Aerosol Application Instructions

Follow the procedure below for best results. We recommend a coat with a dry film thickness of roughly 1 mil [25 μm]. For thicker coats, apply many thin coats as opposed to spraying a single thick coat.

Prerequisites

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

Material & Equipment

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

To apply the required thickness by weight

1. Shake the can vigorously for 2 minutes,
2. Spray a test pattern. This step ensures good flow quality and helps establish appropriate distance to avoid runs.
3. At a distance of 20 to 25 cm (8 to 10 inches), 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.
4. Before the next coat, rotate the board 90° to ensure good coverage.
5. Wait at least 2 minutes, and spray another coat. The delay avoids trapping solvent between coats.
6. Apply other coats until desired thickness is achieved (go to Step 3).
7. Let dry for 3-5 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.

To clear nozzle of aerosol between use or for storage

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

ATTENTION! Failure to clear nozzle can lead to valve being blocked open or closed in a non-noticeable way.

- If blocked closed, the can will not be usable.
- If blocked slightly open, the contents can spill out overnight creating a mess.

To cure at Room temperature

- Let air dry 24 hours

To accelerate cure by heat

- After flash off, put in oven or under heat lamp at 65 °C for 30 min.

NOTE: Coats that are very thick require more time to dry. Heat curing ensures optimal performance.

ATTENTION! If heat curing, do not exceed 65 °C as this may cause surface defects due to solvents evaporating off too quickly.

Packaging and Supporting Products

Cat. No.	Packaging	Net Volume		Net Weight		Packaging Weight	
419C-340G	Aerosol	446 mL	15.1 fl oz	340 g	12 oz	4.60 kg [a]	10.1 [a]
419C-55ML	Bottle	55 mL	1.86 fl oz	48.1 g	1.69 oz	0.95 kg [b]	2.10 lb [b]
419C-1L	Can	945 mL	1.99 pt	825 g	1.82 lb	0.95 kg [b]	2.10 lb [b]
419C-4L	Can	3.78 L	1 gal	3.3 kg	7.28 lb	4.0 kg	8.82 lb
419C-20L	Can	18.9 L	5.04 gal	16.5 kg	36.4 lb	TBD	TBD

a) Case pack of 10
b) Case pack of 5

Thinners & Conductive Coating Removers

- *Thinner*: Cat. No. 435-1L, 435-4L
- *Thinner 1*: Cat. No. 4351-1L, 4351-4L

Technical Support

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

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Warranty

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