

Acrylic Conformal Coating

Description

419C Acrylic Conformal Coating is an IPC-CC-830B and UL 94 V-0 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.

419C coating protects electronic 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.

Features and Benefits

- *Certified UL 94 V-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, free of ozone depletion compounds*
- *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*

Usage Parameters

Properties	Value
Tack free	3–5 min
Recoat time	2 min
Full cure @22 °C [72 °F]	24 h
Full cure @65 °C [149 °F]	30 min
Shelf life	5 y
Theoretical coverage per litre ^{a)}	≤85 000 cm ² [≤13 00 in ²]
Theoretical coverage per US gallon ^{a)}	≤325 000 cm ² [≤50 000 in ²]

a) Estimate based on a coat thickness of 25 µm [1.0 mil] and 65% transfer efficiency.

Temperature Ranges

Properties	Value
Constant service temperature	-65 to 125 °C [-85 to 257 °F]
Storage temperature limits	-5 to 40 °C [23 to 104 °F]

Cured Properties

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	94 V-0
Electrical Properties	Method	Value
Breakdown voltage @0.9 mil	ASTM D 149	1 280 V [1.28 kV]
Dielectric strength @0.9 mil	ASTM D 149	1 450 V/mil [57.1 kV/mm]
Dielectric withstand voltage	per IPC-TM-650	>1 500 V [>1.5 kV]
Insulation resistance (after 24 h)	IPC-TM-650 Test 2.6.3.4	5 x 10 ¹² Ω

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

Cured Properties

Thermal Properties	Method	Value
Glass transition temperature (T _g)	ASTM E 831	46 °C [115 °F]
CTE ^{a)} prior T _g	ASTM E 831	190 ppm/°C [374 ppm/°F]
Mechanical Properties	Method	Value
Pencil hardness (ABS)	ASTM D 3363	B, soft
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 94 V-0 and IPC-CC-830B standards test results.

a) Coefficient of Thermal Expansion (CTE) units are in ppm/°C = in/in/°C × 10⁻⁶ = unit/unit/°C × 10⁻⁶.

Uncured Properties

Physical Properties	Method	Value
Odor	—	Ethereal
Viscosity @23 °C [73 °F]	Brookfield SP1	≥7 cP [≥0.007 Pa·s]
Density	MIL-STD-45662A	0.88 g/mL
Flash point	Closed cup	-17 °C [1.4 °F]
Boiling point	—	≥56 °C [≥133 °F]
Solids content (w/w)	—	17%

Compatibility

The 419C adheres to most plastics and metals used to house printed circuit assemblies; however, it is not compatible with contaminants like water, oil, or greasy flux residues that may affect adhesion. If contamination is present, first clean the surface to be coated with MG Chemicals 824 Isopropyl alcohol.

Attention!

Do not use on thin plastics or plastics where you want to keep original surface. The product contains a controlled amount of solvents designed to chemically etch plastic surfaces to help adhesion.

Storage

Store between -5 and 40 °C [23 and 104 °F] in a dry area, away from sunlight.

Health and Safety

Please see the 419C-Liquid Safety Data Sheet (SDS) for further details on transportation, storage, handling, safety guidelines, and regulatory compliance.

Application Instructions

Spray Equipment

The spray gun recommendations below are based on generic paint guns and may vary by brands. Consult your spray gun manufacturer's guide.

Initial Setting Recommendations

Air Cap	HVLP (high volume, low pressure) or LVMP (low volume, medium pressure)		
Pressure	Inlet: 23 psi	Air flow: 13.5 SCFM ^{a)}	Air cap: 10-15 psi
Fluid Tip	0.8–1.3 mm		

a) Standard cubic foot per minute

Spraying:

1. Stir the coating gently but thoroughly.
2. Spray a test pattern to ensure good flow quality.
3. At an approximate distance of 20–25 cm (8–10 in), tilt the board 45° from a vertical position and spray a thin and even coat. Use spray-and-release strokes with an even motion to avoid excess paint in one spot. Start and end each stroke off the surface.
4. Wait 2 min before applying another coat to avoid trapping solvent.
5. Rotate the board 90° and spray again to ensure good coverage.
6. Apply other coats until desired thickness is achieved (go to step 3).
7. Let dry for 2 min at room temperature before heat cure.

Touch up by brushing:

1. Stir the coating gently but thoroughly.
2. Use a brush apply a small amount to touch up.

Dip coating:

Use a Ford or Zahn cup to monitor the viscosity of the coating as the solvent will evaporate over time.

1. Hang the PCB on a dipping arm.
2. Slowly lower the PCB into a tank and leave immersed in the coating for 2 min to allow penetration.
3. Slowly withdraw the PCB from the tank at an approximate rate of 6"/min.
4. Let dry to tack free finish before applying additional coats or heat cure.

Selective coating:

Custom blended solutions are available and have been verified for use with selective coating machines using both non-atomised and film coating applicators. To inquire about a custom solution tailored to your equipment, contact MG Chemicals' Technical Support for assistance.

Cure Instructions

Room temperature cure:

- Let cure at room temperature for 24 h.

Heat cure:

- Put in oven at 65 °C [149 °F] for 30 min.

Packaging and Supporting Products

Cat. No.	Packaging	Net Volume	Net Weight	Packaged Weight
419C-340G	Aerosol	446 mL [15.0 fl oz]	340 g [11.9 oz]	4.60 kg [10.1 lb] ^{a)}
419C-1L	Can	945 mL [1.99 pt]	825 g [1.82 lb]	1.02 kg [2.10 lb] ^{b)}
419C-4L	Can	3.78 L [1.00 gal]	3.30 kg [7.28 lb]	4.00 kg [8.82 lb]
419C-20L	Can	18.9 L [5.04 gal]	16.5 kg [36.4 lb]	Not available

a) Case pack of 10

b) Case pack of 5

Technical Support

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

Email: support@mgchemicals.com

Phone: +(1) 800-340-0772 (Canada, Mexico & USA)

+ (1) 905-331-1396 (International)

+ (44) 1663 362888 (UK & Europe)

Fax: +(1) 905-331-2862 or +(1) 800-340-0773

Mailing address: Manufacturing & Support
1210 Corporate Drive
Burlington, Ontario, Canada
L7L 5R6

Head Office
9347-193rd Street
Surrey, British Columbia, Canada
V4N 4E7

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

UL 94 V-0

Qualification Criteria	Test Method	Results
Coating flammability	UL 94 V (File # E203094)	94 V-0

Qualified IPC-CC-830B

Qualification Criteria	Test Method	Results
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: Qualified independently by Pacific Testing Laboratories, Inc.