

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 @25 °C [77 °F] | 24 h |
| Full cure @65 °C [149 °F] | 30 min |
| Shelf life | 5 y |
| Theoretical coverage per 340 g can ^{a)} | ≤6 400 cm ² [≤1 000 in ²] |

a) 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 | -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 | 0.87 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 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-Aerosol Safety Data Sheet (SDS) for further details on transportation, storage, handling, safety guidelines, and regulatory compliance.

Application Instructions

Spraying:

1. Shake the can vigorously.
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.

Clearing nozzle between use:

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

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.

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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.