

## Premium Acrylic Conformal Coating

### Description

419E is a one-part, UL 746E certified, acrylic conformal coating. It cures to a durable, flexible and smooth finish. It is easy to apply and can be handled in 15 minutes. It may be removed with appropriate strippers, or soldered through for repair or rework.

419E creates a robust moisture barrier that protects printed circuit boards in humid environments. It provides strong protection against moisture, corrosion, fungus, dirt, dust, thermal shock, short circuits, high-voltage arcing, and static discharge.

### Features and Benefits

- Certified UL 746E (File# [E203094](#))
- Meets IPC-CC-830B
- Xylene and toluene free
- Fluoresces under UV-A light
- Suitable for use with robotic coating equipment

### Usage Parameters

Properties	Value
Tack free	11 min
Recoat time	6 min
Full cure @22 °C [72 °F]	24 h
Full cure @65 °C [149 °F]	30 min
Full cure @80 °C [176 °F]	15 min
Full cure @100 °C [212 °F]	5 min
Shelf life	5 y
Theoretical coverage per litre <sup>a)</sup>	≤59 000 cm <sup>2</sup> [≤9 200 in <sup>2</sup> ]
Theoretical coverage per US gallon <sup>a)</sup>	≤226 000 cm <sup>2</sup> [≤35 000 in <sup>2</sup> ]

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

## Temperature Ranges

Properties	Value
Constant service temperature	-65–130 °C [-85–266 °F]
Storage temperature limits	-5–40 °C [23–104 °F]

## Cured Properties

Physical Properties	Method	Value
Color	Visual	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	94 V-0
Electrical Properties	Method	Value
Breakdown voltage @0.9 mil	ASTM D 149	950 V [0.95 kV]
Dielectric strength @0.9 mil	ASTM D 149	1 100 V/mil [44 kV/mm]
Dielectric withstand voltage	per IPC-TM-650	>1 500 V [>1.5 kV]
Thermal Properties	Method	Value
Glass transition temperature (T <sub>g</sub> )	ASTM E 831	54 °C [129 °F]
CTE <sup>a)</sup> prior T <sub>g</sub>	ASTM E 831	160 ppm/°C [320 ppm/°F]

## Cured Properties

Mechanical Properties	Method	Value
Adhesion (ABS)	ASTM D 3359	5B
(PC)	ASTM D 3359	5B
(PVC)	ASTM D 3359	4B
(Polyamide)	ASTM D 3359	5B
(Glass)	ASTM D 3359	4B
(Copper)	ASTM D 3359	5B
(Aluminum)	ASTM D 3359	5B
Pencil hardness (ABS)	ASTM D 3363	H, hard

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

## Uncured Properties

Physical Properties	Method	Value
Odor	—	Ester-like, fruity
Viscosity @25 °C [75 °F] <sup>a)</sup>	Brookfield SP1	160 cP [0.16 Pa·s]
Density	ASTM D 1475	0.88 g/mL
Flash point	Closed cup	-9 °C [16 °F]
Boiling point	—	≥80 °C [≥176 °F]
Solids content (w/w)	Calculated	29%

a) Brookfield viscometer at 30 rpm with spindle LV S61.

## Compatibility

The 419E 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 to 40 °C [23 to 104 °F] in a dry area, away from sunlight.

### Health and Safety

Please see the 419E-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

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

a) Standard cubic foot per minute

#### Spraying:

1. Dilute coating with 4352 Thinner 2. Adjust ratio if required.

2. Stir the coating gently but thoroughly.
3. Spray a test pattern to ensure good flow quality.
4. 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.
5. Wait 6 min before applying another coat to avoid trapping solvent.
6. Rotate the board 90° and spray again to ensure good coverage.
7. Apply other coats until desired thickness is achieved (go to step 3).
8. Let dry for 6 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.  
—OR—
- Put in oven at 80 °C [176 °F] for 15 min.  
—OR—
- Put in oven at 100 °C [212 °F] for 5 min.

## Packaging and Supporting Products

Cat. No.	Packaging	Net Volume	Net Weight
----------	-----------	------------	------------

## Packaging and Supporting Products

419E-1L	Can	945 mL [1.99 pt]	830 g [1.83 lb]
419E-4L	Can	3.78 L [1.00 gal]	3.32 kg [7.32 lb]
419E-20L	Pail	18.9 L [4.99 gal]	16.6 kg [36.6 lb]
419E-340G	Aerosol	420 mL [14.2 fl oz]	340 g [11.9 oz]

## 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](http://www.mgchemicals.com).

**Email:** [support@mgchemicals.com](mailto: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.