

Silicone Modified Conformal Coating

Description

422B is a one-part, acrylic-silicone blend conformal coating that cures to a durable, flexible and smooth finish. It is easy to apply and can be handled in only 10 minutes. It may be removed with appropriate strippers or soldered through for repair or rework.

422B is designed for applications where both high service temperature and flexibility are required. It puts minimum stress on components during thermal cycling, making it ideal for applications that involve a wide temperature range. 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 94 V-0 (File# [E203094](#))*
- *Maximum constant service temperature of 200 °C [392 °F]*
- *Fluoresces under UV-A light (blacklight)*
- *Validated for selective robotic coating equipment including PVA and Nordson ASYMTEK*
- *Excellent corrosion resistance—tested in salt spray environment with no oxidation or coating damage*

Usage Parameters

Properties	Value
Tack free	5–7 min
Recoat time	5 min
Full cure @22 °C [72 °F]	48 h
Full cure @65 °C [149 °F]	20 min
Shelf life	5 y
Theoretical coverage per liter ^{a)}	≤70 000 cm ² [≤10 000 in ²]
Theoretical coverage per US gallon ^{a)}	≤267 000 cm ² [≤41 000 in ²]

a) Estimate based on a coat thickness of 25 µm [1 mil] and 65% transfer efficiency

Temperature Ranges

Properties	Value
Constant service temperature	-40 to 200 °C [-40 to 392 °F]
Storage temperature limits	-5 to 40 °C [23 to 104 °F]

Cured Properties

Physical Properties	Method	Value
Color	Visual	Clear
Solderability	—	Fair
Flexibility	—	Excellent
Flammability	94 V (UL File # E203094)	94 V-0
UV inspection absorption max	Absorption spectrum	375 nm (near UV)
UV inspection fluorescence max	Emission spectrum	437 nm (blue)
Electrical Properties	Method	Value
Dielectric strength @0.0150"	IPC-TM-650 Test 2.5.6.1	1 056 V/mil [41.6 kV/mm]
Dielectric withstand voltage	per IPC-TM-650	>1 500 V [>1.5 kV]
Volume resistivity @23 °C, 50% RH	ASTM D 257-07	$1.2 \times 10^{15} \Omega \cdot \text{cm}$
Surface resistivity	ASTM D 257-07	$4.5 \times 10^{16} \Omega/\text{sq}$
Dielectric constant @60 Hz & 25 °C [77 °F] @1 MHz & 25 °C [77 °F]	ASTM D 150-98 ASTM D 150-98	2.35 1.99
Dissipation factor @60 Hz & 25 °C [77 °F] @1 MHz & 25 °C [77 °F]	ASTM D 150-98 ASTM D 150-98	0.037 0.012

Cured Properties

Thermal Properties	Method	Value
CTE ^{a)} prior T _g	IPC-TM-650 Test 2.4.24	253 ppm/°C [487 ppm/°F]
Glass transition temperature (T _g)	IPC-TM-650 Test 2.4.24	None detected
Softening point	IPC-TM-650 Test 2.4.24	31 °C [88 °F]
Mechanical Properties	Method	Value
Adhesion (ABS) (PC) (PVC) (Polyamide) (Glass) (Copper) (Aluminum) (PC) (FR4)	ASTM D 3359 ASTM D 3359 ASTM D 3359 ASTM D 3359 ASTM D 3359 ASTM D 3359 ASTM D 3359 ASTM D 3359 ASTM D 3359	TBD
Pencil hardness (ABS)	ASTM D 3363	F, hard
Environmental & Ageing Study	Method	Value
Salt Spray Test: 7 day @35 °C + Salt/Fog Cross-hatch adhesion Cracking, unwashed area Visual color, unwashed area Peeling, unwashed area	ASTM B117-2011 ASTM D3359-2009 ASTM D661-93 ASTM D1729-96 ASTM D1729-96	— 5B, 0% area removed None No change None

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	11 cP [0.011 Pa·s]
Density	—	0.90 g/mL
Flash point	Closed cup	-18 °C [-0.40 °F]
Boiling point	—	55 °C [131 °F]
Solids content (w/w)	—	28%

Compatibility

The 422B 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 422B-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 5 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 5 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 48 h.

Heat cure:

- Put in oven at 65 °C [149 °F] for 20 min.

Packaging and Supporting Products

Cat. No.	Packaging	Net Volume	Net Weight	Packaged Weight
422B-55ML	Bottle	55 mL [1.86 fl oz]	49.4 g [1.74 oz]	190 g [0.42 lb] ^{a)}
422B-1L	Can	945 mL [1.99 pt]	849 g [1.87 lb]	1.05 kg [2.32 lb] ^{a)}
422B-4L	Can	3.78 L [1.00 gal]	3.39 kg [7.49 lb]	3.80 kg [8.37 lb]
422B-20L	Pail	18.9 L [5.04 gal]	16.9 kg [37.4 lb]	20.5 kg [45.2 lb]
422B-P	Pen	5 mL [0.16 fl oz]	4.49 g [0.15 oz]	4.60 g [0.01 lb]
422B-340G	Aerosol	425 mL [14.3 fl oz]	340 g [11.9 oz]	460 g [1.01 lb] ^{b)}
422B-340GCA	Aerosol	425 mL [14.3 fl oz]	340 g [11.9 oz]	460 g [1.01 lb] ^{b)}

a) Case pack of 5

b) Case pack of 10

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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