

Epoxy Conformal Coating

Description

4225 is a two-part epoxy conformal coating. It conforms to a durable, tough, semi-flexible coating with an excellent finish. It protects against harsh chemicals, humidity, corrosion, oil, dirt, thermal shock, and abrasion. It also prevents high-voltage arcing, short circuits, and static discharges. 4225 is a promising choice where extreme physical and chemical resistance are required.

Features and Benefits

- *2:1 mix ratio*
- *Ready to spray*
- *Meets IPC-CC-830B*
- *Inspection under UV light*
- *Thin coating application—can be coated as thin as 0.5 mil*
- *Excellent corrosion and chemical resistance*

Usage Parameters

Properties	Value
Working life @22 °C [72 °F]	4 h
Re-coat time	15 min
Dry to touch	7 h
Processing time @100 °C [212 °F]	20 to 25 min
Full cure @22 °C [72 °F]	48 h
Full cure @65 °C [149 °F]	4 h
Full cure @80 °C [176 °F]	2 h
Full cure @100 °C [212 °F]	40 min

Temperature Ranges

Properties	Value
Constant service temperature	-40 to 140 °C [-40 to 284 °F]
Storage temperature of unmixed parts	16 to 27 °C [61 to 81 °F]

Cured Properties

Physical Properties	Method	Value ^{a)}
Color	Visual	Clear
Adhesion (2024T3 Aluminum)	ASTM D3359 Test Method B	5B, hard
Adhesion (110 H02 Copper)	ASTM D3359 Test Method B	5B, hard
Electrical Properties	Method	Value
Breakdown voltage	ASTM D 149	TBD
Dielectric strength	ASTM D 149	TBD
Breakdown voltage @3.175 mm [1/8"]	Reference fit ^{b)}	TBD
Dielectric strength @3.175 mm [1/8"]	Reference fit ^{b)}	TBD
Moisture insulation resistance	IPC-TM-650 2.6.3.4	10 ¹² Ω
Electrical Properties	Method	Value
Glass transition temperature (T _g)	ASTM D 3418	42 °C [108 °F]
CTE ^{c)} prior T _g after T _g	ASTM E 831 ASTM E 831	210 ppm/°C [410 ppm/°F] 245 ppm/°C [473 ppm/°F]

Note: Specifications are for epoxy samples cured at 80 °C for 2 hours and conditioned at ambient temperature and humidity.

a) N/mm² = mPa; lb/in² = psi

b) To allow comparison between products, the dielectric strength was recalculated with the Tautscher equation fitted to 5 experimental values and extrapolated to a standard thickness of 1/8" (3.175 mm).

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

Uncured Properties

Physical Properties	Mixture (A:B)
Color	Clear
Viscosity @25 °C [77 °F]	20 cP [0.02 Pa·s] ^{a)}
Density	0.95 g/mL
Mix ratio by volume	2:1
Mix ratio by weight	2.3:1

Physical Properties	Part A	Part B
Color	Clear	Clear, amber
Viscosity @25 °C [77 °F]	10 cP [0.01 Pa·s] ^{a)}	60 cP [0.06 Pa·s] ^{a)}
Density	0.97 g/mL	0.89 g/mL
Odor	Ester-like	Ester-like

a) Brookfield viscometer at 100 rpm with spindle LV S61

Compatibility

Adhesion—4225 epoxy adheres to most materials found on 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.

For substrate substances with weak adhesion strengths, surface preparation such as sanding or pre-coating with a suitable primer may improve adhesion.

Storage

Store between 16 and 27 °C [61 and 81 °F] in a dry area, away from sunlight.

Health and Safety

Please see the 4225 Safety Data Sheet (SDS) parts A and B for further details on transportation, storage, handling, safety guidelines, and regulatory compliance.

Application Instructions

For best results, follow the procedure below. Make necessary adjustments according to your spray gun usage instructions. Let down is not required for 4225 since it is ready to spray. A recommended maximum thickness is 2 mil [51 µm].

Spray Equipment

Use a HVLP (high-volume, low pressure) spray gun using the initial settings described in the following table. Adjust these settings and recommendations as required.

Initial Setting Recommendations

Air Cap	#3 HVLP		
Pressure	<i>Inlet</i> 23 psi	<i>Air flow</i> ^{a)} 13.5	<i>Air cap</i> 10 psi
Fluid tip	1.3 mm [0.051"]	1.3 mm [0.051"] ^{b)}	

Note: These recommendations are based on a generic paint guns and may differ by brands. Consult your spray gun manufacturer's guide.

a) SCFM = standard cubic foot per minute

b) If no or reduced let down is performed, this may be a better tip choice.

Mixing and spraying:

1. Stir contents of the part A and part B container thoroughly.
3. Measure 2 parts of A and 1 part of B by volume.
4. Pour both parts into a mixing container while stirring. Ensure all contents are transferred.
5. Thoroughly mix parts A and B together.
6. Adjust the spray settings for the best flow and spray quality. Test spray an appropriate distance to avoid paint runs. A distance between 23 to 30 cm (9 to 12 in) is recommended.
7. Spray a thin and even coat onto the surface.
8. Close the part A and B containers tightly between uses to prevent skinning.
9. Discard unused mixed epoxy and clean the spray gun with MG 434 Acetone.

Attention!

Spraying overly thick coats may cause paint runs and affect solvent evaporation.

Cure Instructions

Room temperature cure:

- Let cure at room temperature for 48 hours.

Heat cure:

- Put in oven at 65 °C [149 °F] for 4 hours.
—OR—
- Put in oven at 80 °C [176 °F] for 2 hours.
—OR—
- Put in oven at 100 °C [212 °F] for 40 minutes.

Packaging and Supporting Products

Cat. No.	Packaging	Net Volume
4225-1.35L	2 Can Kit	1.35 L [1.42 qt]
4225-2.7L	3 Can Kit	2.7 L [2.85 qt]
4225-10.8L	3 Can Kit	10.8 L [2.85 gal]
4225-60L	3 Pail Kit	60 L [15.8 gal]
4225-540L	3 Drum Kit	540 L [142 gal]

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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