One-part Epoxy, General Purpose Adhesive, Low T_g

Description

9300 is a general purpose, one-part epoxy adhesive with a low cure temperature. It is smooth, thixotropic, self-leveling, and bonds well to a wide variety of substances. It has an unlimited working life at room temperature and does not require frozen storage.

This product is designed for low stress bonding in electronic assembly operations. It does not require mixing and can be readily used in manual, pneumatic and robotic dispensing processes.

9300 has been formulated to have a low T_g, which minimizes stress on substrates during temperature changes. For a higher T_g, use 9310.

Features and Benefits

- *Minimum cure temperature of 70 °C [158 °F]*
- *Unlimited working life*
- *Shelf life: 18 months at room temperature*
- *Provides strong electrical insulation*
- *T_g of 22 °C [72 °F]*
- *Strong resistance to humidity, salt water, acids, bases, and aliphatic hydrocarbons*

Usage Parameters

Properties	Value
Working life @22 °C [72 °F]	Unlimited
Shelf life @22 °C [72 °F]	18 months
Full cure @22 °C [72 °F]	Heat cure only
Full cure @70 °C [158 °F]	1 h
Full cure @80 °C [176 °F]	40 min
Full cure @90 °C [194 °F]	25 min

Temperature Ranges

Properties	Value
Constant service temperature	-55 to 140 °C [-67 to 284 °F]
Storage temperature	-10 to 27 °C [14 to 81 °F]

Cured Properties

Physical Properties	Method	Value [a]
Color	Visual	Amber
Density @25 °C [77 °F]	ASTM D 1475	1.18 g/mL
Hardness	Shore D Durometer	80D
Tensile strength	ASTM D 638	4.7 N/mm^2 [680 lb/in^2]
Compressive strength	ASTM D 695	91 N/mm^2 [13 200 lb/in^2]
Lap shear strength (stainless steel)	ASTM D 1002	7.9 N/mm^2 [1 100 lb/in^2]
Lap shear strength (aluminum)	ASTM D 1002	6.2 N/mm^2 [900 lb/in^2]
Lap shear strength (copper)	ASTM D 1002	8.6 N/mm^2 [1 200 lb/in^2]
Lap shear strength (brass)	ASTM D 1002	7.2 N/mm^2 [1 000 lb/in^2]
Electrical Properties	**Method**	**Value**
Breakdown voltage @3.7 mm	ASTM D 149	47 800 V [47.8 kV]
Dielectric strength @3.7 mm	ASTM D 149	330 V/mil [13 kV/mm]
Breakdown voltage @3.175 mm [1/8"]	Reference fit [b]	45 000 V [45 kV]
Dielectric strength @3.175 mm [1/8"]	Reference fit [b]	357 V/mil [14 kV/mm]
Resistivity	ASTM D 257	3.4 x 10^{12} Ω·cm
Conductivity	ASTM D 257	2.9 x 10^{-13} S/cm

Note: Specifications are for epoxy samples cured at 90 °C for 25 min and conditioned at ambient temperature and humidity.

a) N/mm^2 = mPa; lb/in^2 = 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).

Cured Properties

Thermal Properties	Method	Value
Glass transition temperature (T_g)	ASTM E 831	22 °C [72 °F]
CTE [a] prior T_g after T_g	ASTM E 831 ASTM E 831	49 ppm/°C [120 ppm/°F] 197 ppm/°C [387 ppm/°F]

Note: Specifications are for epoxy samples cured at 90 °C for 25 min and conditioned at ambient temperature and humidity.

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
Color	Visual	Amber
Viscosity @25 °C [77 °F]	IPC TM-650 Method 2.4.34.4	120 000 cP [102 000 mm^2/s] [a]
Density	ASTM D 1475	1.17 g/mL

a) Brookfield viscometer at 2.5 rpm with spindle RV B92

Compatibility

Adhesion—9300 epoxy 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.

For substrates with weak adhesion strength, surface preparation (such as sanding, or pre-coating with a suitable primer) may improve adhesion.

Chemical—The cured epoxy adhesive is inert under normal conditions. It can tolerate short-term exposure to fuels or similar non-polar organic solvents, but it may not be suitable for prolonged exposure. Avoid using with strong acids, strong bases, or strong oxidizers.

Storage

Store between -10 and 27 °C [14 and 81 °F] in a dry area, away from sunlight. Some of the components are sensitive to air. To maximize shelf life, always recap product firmly when not in use.

Health and Safety

Please see the 9300 Safety Data Sheet (SDS) for further details on transportation, storage, handling, safety guidelines, and regulatory compliance.

Application Instructions

For best results, follow the procedure below. This product does not require mixing prior to use, and can be applied with a spatula, trowel, or automated dispensing machine.

Syringe or cartridge:

1. For 10 mL size, twist and remove the cap from the syringe. Do not discard the cap.
2. For the 300 mL size, cut the end of the cartridge tip.
   a. Screw the tip on the cartridge.
   b. Insert the cartridge in a caulking gun.
3. Dispense the adhesive evenly to both surfaces.
4. To stop the flow, pull back on the plunger.
5. Clean nozzle to prevent contamination and material buildup.
6. Replace the cap on the cartridge or syringe.

Cure Instructions

Room temperature cure:

Do NOT cure at room temperature. This product will only cure at elevated temperatures.

Heat cure:

- Put in oven at 70 °C [158 °F] for 1 h.
  —OR—
- Put in oven at 80 °C [176 °F] for 40 min.
  —OR—
- Put in oven at 90 °C [194 °F] for 25 min.

Dispensing Accessories

9300-300ML cartridges are compatible with caulking guns that are readily available for purchase at local hardware stores.

Packaging and Supporting Products

Cat. No.	Packaging	Net Volume	Packaged Weight
9300-10ML	Syringe	10 mL [0.33 fl oz]	0.04 kg [0.09 lb]
9300-300ML	Cartridge	300 mL [10.1 fl oz]	0.47 kg [1.03 lb]

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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