

Fast Cure Thermally Conductive Adhesive, Flowable



**RoHS
Compliant**

Description

The MC002965 is a thermally conductive, fast-cure two-part epoxy adhesive. It is off-white, smooth, thixotropic, and bonds well to a wide variety of substances. It is also flame retardant, and meets the UL 94V-0 standard. For a 1 mL quantity, a minimal service cure can be achieved in 15 minutes at room temperature, and a full cure in 3 hours.

This product is used to bond heat sinks, LEDs and other heat-generating components in electronic assemblies. It is suitable for use with dual-syringes, mix-tips and automatic dispensing systems.

Benefits and Features

- Thermal conductivity of 0.8 W/(m·K)
- 1:1 mix ratio
- Working life: 4 minutes
- Set time: 15 minutes
- Cure time: 3 hours at room temperature or 15 minutes at 65°C (149°F)
- Flame retardant—meets UL 94V-0 standard
- Provides strong electrical insulation
- Low CTE prior T_g
- High tensile and compressive strength
- Strong resistance to humidity, salt water, mild bases, and aliphatic hydrocarbons
- Shelf life: ≥3 years

Usage Parameters

Properties	Value
Working life @ 22°C (72°F)	4 min
Shelf life @ 22°C (72°F) ^{a)}	≥3 years
Set time @ 22°C (72°F)	15 min
Full cure @ 22°C (72°F)	3 hour
Full cure @ 65°C (149°F)	15 min

Temperature Ranges

Properties	Value
Constant Service Temperature	-40 to 150°C
	(-40 to 302°F)
Intermittent Temperature Limits ^{a)}	175°C (347°F)
Storage Temperature	22 to 27°C
	(72 to 81°F)

^{a)} Temperature that can be withstood for short periods without sustaining damage.

Cured Properties

Physical Properties	Method	Value ^{a)}
Colour	Visual	Beige
Density @ 26°C [79°F]	ASTM D 1475	1.63 g/mL
Hardness	Shore D durometer	82D
Tensile Strength	ASTM D 638-08	26 N/mm ² (3 700 lb/in ²)
Compression Strength	ASTM D 695-10	78 N/mm ² (11 000 lb/in ²)
Lap Shear Strength (Stainless Steel)	ASTM D 1002	2.5 N/mm ² (360 lb/in ²)
Lap Shear Strength (Aluminium)	ASTM D 1002	1.7 N/mm ² (240 lb/in ²)
Lap Shear Strength (Copper)	ASTM D 1002	5.8 N/mm ² (850 lb/in ²)
Lap Shear Strength (Polycarbonate)	ASTM D 1002	0.6 N/mm ² (90 lb/in ²)

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Physical Properties	Method	Value ^{a)}
Lap Shear Strength (ABS)	ASTM D 1002	0.3 N/mm ² (40 lb/in ²)
Flammability	UL 94	Meets 94 V-0
Electric Properties	Method	Value
Breakdown Voltage @ 3.0mm	ASTM D 149	43 800V (43.8 kV)
Dielectric Strength @ 3.0mm	ASTM D 149	375V/mil [14.8 kV/mm]
Breakdown Voltage @ 3.175 mm [1/8"]	Reference fit ^{a)}	45 900V [45.9 kV]
Dielectric Strength @ 3.175 mm [1/8"]		367V/mil [14.5 kV/mm]
Volume Resistivity	ASTM D 257	$7.9 \times 10^{12} \Omega \cdot \text{cm}$
Volume Conductivity	ASTM D 257	$1.3 \times 10^{-13} \text{ S/cm}$
Thermal Properties	Method	Value
Glass Transition Temperature (T _g)	ASTM E 3418	25°C (77°F)
CTE ^{b)} Prior T _g	ASTM E 831	34ppm/°C (94ppm/°F)
CTE ^{b)} After T _g	ASTM E 831	146ppm/°C (294ppm/°F)
Thermal Conductivity @ 25°C [77°F]	ASTM E 1461 92	0.8 W/(m.K)
Thermal Conductivity @ 50°C [122°F]	ASTM E 1461 92	0.7 W/(m.K)
Thermal Conductivity @ 100°C [212°F]	ASTM E 1461 92	0.7 W/(m.K)
Thermal Diffusivity @ 25°C [77°F]	ASTM E 1461 92	0.3mm ² /s
Specific Heat Capacity @ 25°C [77°F]	ASTM E 1461 92	1.4 J/(g*K)

Note: Specifications are for epoxy samples cured at 65°C for 15 min and conditioned at ambient temperature and humidity.

^{a)} 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" (3.175mm).

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

Uncured Properties

Physical Property	Mixture (1A:1B)	
Colour	Beige	
Viscosity	Thixotropic	
Density	1.94 g/mL	
Mix Ratio by Volume	1:1	
Mix Ratio by Weight	1:0.9	
Solids Content (w/w)	100%	
Physical Properties	Part A	Part B
Colour	Beige	Off White
Viscosity @ 25°C [77°F]	72 000 cP [72 Pa·s] ^{a)}	110 000 cP [110 Pa·s] ^{b)}
Density	1.71g/mL	1.5g/mL
Odour	Mild	Mercaptan

^{a)} Brookfield viscometer at 5 rpm with spindle RV S92

^{b)} Brookfield viscometer at 2.5 rpm with spindle RV S92

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Compatibility

Adhesion - MC002965 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, which may affect adhesion. In case of contamination, first clean the surface to be coated with Isopropyl Alcohol.

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

Chemical Resistance - Once cured, the epoxy adhesive is inert under normal conditions. It will resist water and salt exposure. It is expected to resist short term exposures to fuels or similar non-polar organic solvents, but it is not suitable for prolonged exposures. Avoid use with strong acids, strong bases, or strong oxidizers.

Storage

Store between 22 to 27°C (72 to 81°F) in a dry area, away from sunlight. Some of the components are sensitive to air, always recap firmly when not in use to maximize shelf life.

Substrate Adhesion in Decreasing Order

Physical Properties	Adhesion
Steel	Stronger
Aluminium	
Fiberglass	
Wood	
Paper, Fiber	
Glass	
Rubber	
Polycarbonate	
Polypropylene Acrylic	Weaker
Polypropylene	Does not bond

Application Instructions

For best results, follow the procedure below. For quantities less than 1 mL or for stricter stoichiometry control, mix by weight with a high-precision balance. Heat cure to achieve optimal conductivity

Syringe:

1. Twist and remove the cap from the syringe. Do not discard cap.
2. Dispense a small amount to ensure even flow of both parts.
3. Without a static mixer, dispense material on a mixing surface or container, and thoroughly mix parts A and B together.
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 syringe.

Cure Instructions

Room temperature cure

Let cure at room temperature for 3 h.

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Heat cure

Put in oven at 65°C [149°F] for 15 min.

Packaging	Net Volume		Net Weight	
Dual Syringe	25mL	0.84 fl oz	95g	0.21 lb

Part Number Table

Description	Part Number
Fast Cure Thermally Conductive Adhesive, Flowable, 25mL, Dual Syringe	MC002965

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