

Fast Cure Thermally Conductive Adhesive

Description

8329TCF is a thermally conductive, fast-cure two-part epoxy adhesive. It is off-white, smooth, viscous, thixotropic, and bonds well to a wide variety of substrates. 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 4 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.

8329TCF has been designed for maximum thermal conductivity with a high viscosity. For a lower viscosity, use 8329TFF. For a longer working life, use 8329TCM or 8329TCS.

Features and Benefits

- Thermal conductivity of 1.0 W/(m·K)
- 1:1 mix ratio
- Working life: 4 minutes
- Set time: 15 minutes
- Cure time: 4 hours at room temperature or 10 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
- RoHS 3 compliant

Usage Parameters

Properties	Value
Working life @22 °C [72 °F]	4 min
Shelf life @22 °C [72 °F]	≥3 y
Set time @22 °C [72 °F]	15 min
Full cure @22 °C [72 °F]	4 h
Full cure @65 °C [149 °F]	10 min
Full cure @80 °C [176 °F]	5 min

Temperature Ranges

Properties	Value
Constant service temperature	-40 to 150 °C [-40 to 302 °F]
Maximum Intermittent temperature ^{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)}
Color	Visual	Off white
Density @25 °C [77 °F]	ASTM D 1475	1.75 g/mL
Hardness	Shore D Durometer	82D
Tensile strength	ASTM D 638	13 N/mm ² [1 900 lb/in ²]
Young's modulus	ASTM D 638	1 700 N/mm ² [250 000 lb/in ²]
Compressive strength	ASTM D 695	48 N/mm ² [7 000 lb/in ²]
Lap shear strength (stainless steel)	ASTM D 1002	5.0 N/mm ² [700 lb/in ²]
Lap shear strength (aluminum)	ASTM D 1002	8.6 N/mm ² [1 200 lb/in ²]
Lap shear strength (copper)	ASTM D 1002	13 N/mm ² [1 900 lb/in ²]
Lap shear strength (brass)	ASTM D 1002	14 N/mm ² [2 100 lb/in ²]
Lap shear strength (polycarbonate)	ASTM D 1002	1.5 N/mm ² [220 lb/in ²]
Lap shear strength (ABS)	ASTM D 1002	2.0 N/mm ² [300 lb/in ²]
Flammability	UL 94	Meets 94 V-0

Note: Specifications are for epoxy samples cured at 22 °C for 24 h and conditioned at ambient temperature and humidity.

a) N/mm² = mPa; lb/in² = psi

Cured Properties

Electrical Properties	Method	Value
Breakdown voltage @2.1 mm	ASTM D 149	35 300 V [35.3 kV]
Dielectric strength @2.1 mm	ASTM D 149	412 V/mil [16.2 kV/mm]
Breakdown voltage @3.175 mm [1/8"]	Reference fit ^{a)}	42 700 V [42.7 kV]
Dielectric strength @3.175 mm [1/8"]	Reference fit ^{a)}	342 V/mil [13.1 kV/mm]
Volume resistivity	ASTM D 257	$3 \times 10^{12} \Omega \cdot \text{cm}$
Volume conductivity	ASTM D 257	$3.3 \times 10^{-13} \text{ S/cm}$
Thermal Properties	Method	Value
Glass transition temperature (T_g)	ASTM E 3418	23 °C [73 °F]
CTE ^{b)} prior T_g after T_g	ASTM E 831 ASTM E 831	23 ppm/°C [73 ppm/°F] 107 ppm/°C [225 ppm/°F]
Thermal conductivity @25 °C [77 °F] @50 °C [222 °F] @100 °C [212 °F]	ASTM E 1461 92 ASTM E 1461 92 ASTM E 1461 92	1.0 W/(m·K) 1.0 W/(m·K) 0.9 W/(m·K)
Thermal diffusivity @25 °C [77 °F]	ASTM E 1461 92	0.4 mm ² /s
Specific heat capacity @25 °C [77 °F]	ASTM E 1461 92	1.3 J/(g·K)

Note: Specifications are for epoxy samples cured at 22 °C for 24 h 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" (3.175 mm).

b) Coefficient of Thermal Expansion (CTE) units are in ppm/°C = in/in/°C $\times 10^{-6}$ = unit/unit/°C $\times 10^{-6}$

Uncured Properties

Physical Properties	Mixture (A:B)
Color	Off white
Viscosity	Thixotropic
Density	1.73 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
Color	White	Slight yellow
Viscosity @25 °C [77 °F]	9 500 000 cP [9 500 Pa·s] ^{a)}	800 000 cP [800 Pa·s] ^{b)}
Density	1.88 g/mL	1.59 g/mL
Odor	Mild	Mercaptan

a) Brookfield viscometer at 1 rpm with spindle RV F96

b) Brookfield viscometer at 1 rpm with spindle RV C93

Compatibility

Adhesion—8329TCF 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 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.

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
Aluminum	
Fiberglass	
Wood	
Paper, Fiber	
Glass	
Rubber	
Polycarbonate	
Acrylic	Weaker
Polypropylene	Does not bond

Health and Safety

Please see the 8329TCF 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. 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 or cartridge:

To insert the cartridge in the gun, see the Application Guide section for dispensing accessories.

1. Twist and remove the cap from the cartridge or syringe. Do not discard cap.
2. Dispense a small amount to ensure even flow of both parts.
3. (Optional) Attach a static mixer.
 - a. Dispense and discard 3 to 5 mL of the product to ensure a homogeneous mixture.
 - b. After use, dispose of static mixer.
4. Without a static mixer, dispense material on a mixing surface or container, and thoroughly mix parts A and B together.
5. To stop the flow, pull back on the plunger.
6. Clean nozzle to prevent contamination and material buildup.
7. Replace the cap on the cartridge or syringe.

Cure Instructions

Room temperature cure:

- Let cure at room temperature for 4 h.

Heat cure:

- Put in oven at 65 °C [149 °F] for 10 min.
—OR—
- Put in oven at 80 °C [176 °F] for 5 min.

Dispensing Accessories

Consult the table below for appropriate accessory selection. See the [Application Guide](#) for instructions on using the dispensing accessories.

Cat. No.	Dispensing Gun	Static Mixer
8329TCF-50ML	8DG-50-1-1	N/A

Packaging and Supporting Products

Cat. No.	Packaging	Net Weight	Net Volume	Packaged Weight
8329TCF-50ML	Dual cartridge	78 g [1.52 fl oz]	45 mL [1.52 fl oz]	111 g [0.25 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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Disclaimer

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