

Thermally Conductive Epoxy Adhesive

Description

8329TFM is a thermally conductive two-part epoxy adhesive. It is dark grey, smooth, thixotropic, and bonds well to a wide variety of substrates.

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.

For a faster working life, use 8329TFF. For a longer working life, use 8329TFS.

Features and Benefits

- Thermal conductivity: 1.1 W/(m·K)
- 1:1 mix ratio
- Working life: 45 minutes
- Cure time: 24 hours at room temperature or 2 hours at 65 °C (149 °F)
- Provides strong electrical insulation
- High tensile 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]	45 min
Shelf life @22 °C [72 °F] ^{a)}	≥3 y
Service cure @22 °C [72 °F]	5 h
Full cure @22 °C [72 °F]	24 h
Full cure @65 °C [149 °F]	2 h
Full cure @80 °C [176 °F]	1 h
Full cure @100 °C [212 °F]	30 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	Black
Density @26 °C [79 °F]	ASTM D 1475	2.18 g/mL
Hardness	Shore D Durometer	72D
Tensile strength	ASTM D 638	4.5 N/mm ² [650 lb/in ²]
Compressive strength	ASTM D 695	44 N/mm ² [6 400 lb/in ²]
Lap shear strength (stainless steel)	ASTM D 1002	9.0 N/mm ² [1 300 lb/in ²]
Lap shear strength (aluminum)	ASTM D 1002	6.6 N/mm ² [950 lb/in ²]
Lap shear strength (copper)	ASTM D 1002	8.0 N/mm ² [1 200 lb/in ²]
Lap shear strength (brass)	ASTM D 1002	7.8 N/mm ² [1 100 lb/in ²]
Lap shear strength (polycarbonate)	ASTM D 1002	0.8 N/mm ² [110 lb/in ²]
Lap shear strength (ABS)	ASTM D 1002	2.1 N/mm ² [300 lb/in ²]

Note: Specifications are for epoxy samples cured at 65 °C for 2.5 h and conditioned at ambient temperature and humidity.

a) N/mm² = mPa; lb/in² = psi

Cured Properties

Electrical Properties	Method	Value
Breakdown voltage	ASTM D 149	16 500 V [16.5 kV]
Dielectric strength	ASTM D 149	180 V/mil [7.3 kV/mm]
Breakdown voltage @3.175 mm [1/8"]	Reference fit ^{a)}	19 500 V [19.5 kV]
Dielectric strength @3.175 mm [1/8"]	Reference fit ^{a)}	160 V/mil [6.1 kV/mm]
Volume resistivity	ASTM D 257	8.9 x 10 ¹² Ω·cm
Volume conductivity	ASTM D 257	1.1 x 10 ⁻¹³ S/cm
Thermal Properties	Method	Value
Glass transition temperature (T _g)	ASTM E 3418	39 °C [103 °F]
CTE ^{b)} prior T _g after T _g	ASTM E 831 ASTM E 831	67 ppm/°C [153 ppm/°F] 125 ppm/°C [257 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	1.1 W/(m·K) 1.1 W/(m·K) 1.0 W/(m·K)
Thermal diffusivity @25 °C [77 °F]	ASTM E 1461 92	0.5 mm ² /s
Specific heat capacity @25 °C [77 °F]	ASTM E 1461 92	1.1 J/(g·K)

Note: Specifications are for epoxy samples cured at 65 °C for 2.5 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 × 10⁻⁶ = unit/unit/°C × 10⁻⁶

Uncured Properties

Physical Properties	Mixture (A:B)
Color	Black
Viscosity	Thixotropic
Density	2.19 g/mL
Mix ratio by volume	1:1
Mix ratio by weight	1:0.96
Solids content (w/w)	100%

Physical Properties	Part A	Part B
Color	Black	Dark grey
Viscosity @25 °C [77 °F]	Not available	2 000 000 cP [2 000 Pa·s] ^{a)}
Density	2.23 g/mL	2.18 g/mL
Odor	Mild	Amine

a) Brookfield viscometer at 2 rpm with spindle RV S95

Compatibility

Adhesion—8329TFM epoxy adheres to many materials found on printed circuit assemblies; however, contaminants like water, oil, and greasy flux residues may affect adhesion. If contamination is present, clean the printed circuit assembly with electronic cleaner such as 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 8329TFM 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 24 h.

Heat cure:

- Put in oven at 65 °C [149 °F] for 2 h.
—OR—
- Put in oven at 80 °C [176 °F] for 1 h.
—OR—
- Put in oven at 100 °C [212 °F] for 30 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
8329TFM-25ML	N/A	N/A
8329TFM-50ML	8DG-50-1-1	8MT-50, 8MT-50FT

Packaging and Supporting Products

Cat. No.	Packaging	Net Volume	Net Weight	Packaged Weight
8329TFM-25ML	Dual syringe	25 mL [0.84 fl oz]	55 g [1.94 oz]	105 g [0.23 lb]
8329TFM-50ML	Dual cartridge	45 mL [1.52 fl oz]	99 g [3.49 oz]	152 g [0.34 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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