Thermally Conductive Epoxy Adhesive

Description

8329TFS is a thermally conductive two-part epoxy adhesive with a long working life. It is dark grey, smooth, thixotropic, and bonds well to a wide variety of substances.

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 shorter working lives, use 8329TFF or 8329TFM.

Features and Benefits

- *Thermal conductivity of 1.2 W/(m·K)*
- *1:1 mix ratio*
- *Working life: 4 hours*
- *Cure time: 80 minutes at 80 °C (176 °F)*
- *Provides strong electrical insulation*
- *High 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 h
Shelf life @22 °C [72 °F] a)	≥3 y
Full cure @22 °C [72 °F]	Heat cure only
Full cure @65 °C [149 °F]	3 h
Full cure @80 °C [176 °F]	80 min
Full cure @100 °C [176 °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	Dark grey
Density @26 °C [79 °F]	ASTM D 1475	2.08 g/mL
Hardness	Shore D Durometer	68D
Tensile strength	ASTM D 638	4.2 N/mm^2 [600 lb/in^2]
Compressive strength	ASTM D 695	42 N/mm^2 [6 000 lb/in^2]
Lap shear strength (stainless steel)	ASTM D 1002	5.0 N/mm^2 [720 lb/in^2]
Lap shear strength (aluminum)	ASTM D 1002	6.3 N/mm^2 [910 lb/in^2]
Lap shear strength (copper)	ASTM D 1002	6.9 N/mm^2 [1 000 lb/in^2]
Lap shear strength (brass)	ASTM D 1002	6.4 N/mm^2 [930 lb/in^2]
Lap shear strength (polycarbonate)	ASTM D 1002	1.8 N/mm^2 [260 lb/in^2]
Lap shear strength (ABS)	ASTM D 1002	1.5 N/mm^2 [220 lb/in^2]

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

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

Cured Properties

Electrical Properties	Method	Value
Breakdown voltage	ASTM D 149	19 800 V [19.8 kV]
Dielectric strength	ASTM D 149	220 V/mil [8.5 kV/mm]
Breakdown voltage @3.175 mm [1/8"]	Reference fit [a)]	23 300 V [23.3 kV]
Dielectric strength @3.175 mm [1/8"]	Reference fit [a)]	186 V/mil [7.3 kV/mm]
Volume resistivity	ASTM D 257	1.0 x 10^{12} Ω·cm
Volume conductivity	ASTM D 257	1.0 x 10^{-13} S/cm
Thermal Properties	**Method**	**Value**
Glass transition temperature (T_g)	ASTM E 831	9 °C [48 °F]
CTE [b)] prior T_g after T_g	ASTM E 831 ASTM E 831	47 ppm/°C [116 ppm/°F] 164 ppm/°C [327 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	1.2 W/(m·K) 1.2 W/(m·K) 1.1 W/(m·K)
Thermal diffusivity @25 °C [77 °F]	ASTM E 1461 92	0.6 mm^2/s
Specific heat capacity @25 °C [77 °F]	ASTM E 1461 92	1.0 J/(g·K)

Note: Specifications are for epoxy samples cured at 80 °C for 80 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" (3.175 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	2.11 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	700 000 cP [700 Pa·s] [a)]
Density	2.23 g/mL	1.96 g/mL
Odor	Mild	Mercaptan

a) Brookfield viscometer at 1 rpm with spindle RV S93

Compatibility

Adhesion—8329TFS 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
Aluminum	Stronger
Steel	
Fiberglass	
Wood	
Paper, Fiber	
Glass	
Rubber	
Polycarbonate	
Acrylic	Weaker
Polypropylene	Does not bond

Health and Safety

Please see the 8329TFS 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:

- Heat cure only

Heat cure:

- Put in oven at 65 °C [149 °F] for 3 h.
  —OR—
- Put in oven at 80 °C [176 °F] for 80 min.
  —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
8329TFS-25ML	N/A	N/A
8329TFS-50ML	8DG-50-1-1	8MT-50, 8MT-50FT

Packaging and Supporting Products

Cat. No.	Packaging	Net Volume	Net Weight	Packaged Weight
8329TFS-25ML	Dual syringe	25 mL [0.84 fl oz]	52.2 g [1.84 oz]	105 g [0.23 lb]
8329TFS-50ML	Dual cartridge	45 mL [1.52 fl oz]	94 g [3.31 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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Disclaimer

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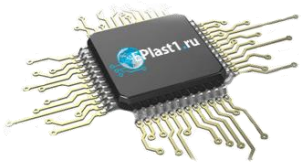

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