ISO 9001 Registered Quality System,
Burlington, Ontario, Canada QMI File # 004008

Medium Cure
Thermal Conductive Epoxy Adhesive
8329TCM Technical Data Sheet

Description

The 8329TCM *Medium Cure Thermal Conductive Epoxy Adhesive* is an electronically insulating epoxy that combines moderate curing rate and high thermal conductivity. It has a convenient 1-to-1 ratio, a 45 minutes work life, and a moderate curing rate. It may achieve a minimal service cure in seven hours at room temperature. The cured adhesive bonds very well to most substrates used in electronic assemblies; and resists thermal and mechanical shocks.

Applications & Usages

The 8329TCM epoxy has many uses. The excellent conductivity improves thermal management for modern high powered devices, such as high-powered electronics and LEDs, increasing their long term reliability. It is used for thermal management situations requiring superior bonding strengths and good thermal transfers.

Benefits and Features

- **Excellent 1.36 W/(m·K) thermal conductivity**
- **Easy 1:1 mix ratio**
- **Adheres to most electronic substrates**
- **Stores and ships at room temperature**—no freezing or dry ice required
- **Very long shelf life of at least two years**—even when stored at room temperature
- **Strong water and chemical resistance** to brine, acids, bases, and aliphatic hydrocarbons

ENVIRONMENT
✓ RoHS
✓ REACH compliant

Curing & Work Schedule

Properties	*Value*
Working Life [a)]	45 min
Shelf Life [b)]	≥2 y
Min. Service Cure [c)]	7 h
Full Cure @22 °C [72 °F]	24 h
Full Cure @45 °C [113 °F]	180 min
Full Cure @65 °C [149 °F]	60 min
Full Cure @80 °C [176 °F]	14 min

a) Pot life for 100 g and room temperature.
b) Shelf life assumes the product is tightly capped and kept below 45 °C.
c) Minimal service cure at 25 °C [77 °F]

Temperature Service Range

Properties	*Value*
Constant Service Temperature	-65 °C to 165 °C [-40 °F to 302 °F]
Maximum Withstand Temperature [c)]	-70 °C to 200 °C [-40 °F to 302 °F]
Storage Temperature of Unmixed Parts	22 to 27 °C [72 to 80 °F]

d) Withstand temperatures the temperature extremes that can be withstood for a short period of times.

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Properties of Cured 8329TCM

Physical Properties	***Method***	***Value*** [a]
Color	Visual	Dark Grey
Density @ 26 °C [79 °F]		2.30 g/cm^3
Hardness	(Shore D durometer)	76D
Tensile Strength	ASTM D 638	10 N/mm^2 [1 400 lb/in^2]
Young's Modulus	"	—
Elongation	"	1.8%
Compressive Strength	ASTM D 695	34 N/mm^2 [4 900 lb/in^2]
Lap Shear Strength (Aluminum 5052)	"	8.2 N/mm^2 [1 200 lb/in^2]
Water Absorption	ASTM D 570	0.35%
Outgassing (Total Mass Loss) @ 24 h	ASTM E 595	3.54%
Water Vapor Release (WVR)	"	0.15%
Collectable Volatile Condensable Material	"	0.18%

Electric Properties	***Method***	***Value***
Breakdown Voltage @4.491 mm	ASTM D 149	29.0 kV
Dielectric Strength @4.491 mm	"	6.5 kV/mm [164 V/mil]
Breakdown Voltage @3.175 mm [1/8"]	Reference fit [b]	24.3 kV
Dielectric Strength @3.175 mm [1/8"]		7.7 kV/mm [195 V/mil]
Volume Resistivity	ASTM D 257	9 x10^{12} Ω·cm
Dielectric Dissipation & Constant @1 kHz	ASTM D 150-98	*dissipation, D* 0.025 *constant, k'* 5.43
Insulating		Yes
Conductive		No

Thermal Properties	***Method***	***Value***
Thermal Conductivity @25 °C	ASTM E 1461	1.36 W/(m·K)
@50 °C	"	1.34 W/(m·K)
@100 °C	"	1.28 W/(m·K)
Heat Deflection Temperature	ASTM D 648	42 °C [115 °F]
Glass Transition Temperature (T_g)	ASTM D 3418	46 °C [108 °F]
CTE [b] Prior T_g	ASTM E 831	71 ppm/°C
CTE [b] After T_g	ASTM E 831	131 ppm/°C
Specific Heat @25 °C [77 °F]		0.907 J/(g·K)

Note: Specifications are for epoxy samples that were cured at 65 °C for 1 hour. Additional curing time at room temperature was given to allow for optimum curing. Samples were conditioned at 23 °C and 50% RH prior to most tests.

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

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

Properties of Uncured 8329TCM

Physical Property	*Mixture (1A:1B)*
Color	Dark Grey
Density a)	2.43 g/mL
Mix Ratio by Volume (A:B)	1:00:1.00
Mix Ratio by Weight (A:B)	0.93:1.00
Solids Content (w/w)	100%

Physical Property	*Part A*	*Part B*
Color	Dark Grey	Dark Grey
Density	2.48 g/mL	2.38 g/mL
Flash Point	>149 °C [300 °F]	>148 °C [298 °F]
Viscosity	1,300,000 cP [1,300 Pa·s]	6,000,000 cP [6,000 Pa·s]

a) Calculated value based on measures densities of each part
b) Brookfield viscometer at 3 rpm for part A and 0.6 rpm for part B with spindle 7

Principal Components

Name		***CAS Number***
Part A:	Bis-A Epoxide Resin	*25068-38-6*
	Aluminum Oxide	*1344-28-1*
	Zinc Oxide	*1314-13-2*
	Boron Nitride	*110043-11-5*
Part B:	tris-2,4,6-(dimethylaminomethyl) phenol	*90-72-2*
	Mercaptan mixture	*proprietary*
	Aluminum Oxide	*1344-28-1*
	Zinc Oxide	*1314-13-2*
	Boron Nitride	*110043-11-5*

Compatibility

Chemical—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.

Adhesion—As seen in the substrate adhesion table, the 8329TCM 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 4050 Safety Wash, 406B Superwash, or 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.

Substrate Adhesion in Decreasing Order

Physical Properties	*Adhesion*
Steel	Stronger
Aluminum	
Copper/Bronze	
Fiberglass	
Wood	
Paper, Fiber	
Glass	
Rubber	
Acrylic	
Polycarbonate	
Polypropylene a)	
Telflon a)	Weaker

a) Does not bond to polypropylene or teflon

Storage

Store between 22 and 45 °C [72 and 113 °F] in dry area away from sunlight. Because some of the components are sensitive to air, always recap firmly when not in use to maximize shelf life.

Health, Safety, and Environmental Awareness

Please see the 8329TCM **Safety Data Sheet** (SDS) parts A and B for more details on transportation, storage, handling and other security guidelines.

Health and Safety: The 8329TCM parts can ignite if the liquid is both heated and exposed to flames.

Wear safety glasses or goggles and disposable polyvinyl chloride, neoprene, or nitrile gloves while handling liquids. Part B in may cause eye damage. Skin irritation and sensitization may occur if exposed over a long period of time. The epoxy will not wash off once cured. Wash hands thoroughly after use or if skin contact occurs. Do not ingest.

Use in well-ventilated area since vapors are strong smelling may cause irritation of the respiratory tract in susceptible individuals.

The uncured product contains unbound marine pollutants. Dispose of material according to local, regional, national, and international regulation. The cured product is not expected to be environmentally hazardous.

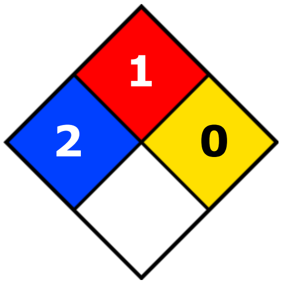
The cured epoxy adhesive presents no known hazard.

Part A

HMIS® RATING

HEALTH:	*** 2**
FLAMMABILITY:	**1**
PHYSICAL HAZARD:	**0**
PERSONAL PROTECTION:	

NFPA® 704 CODES

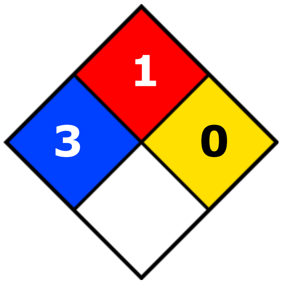


Part B

HMIS® RATING

HEALTH:	*** 3**
FLAMMABILITY:	**1**
PHYSICAL HAZARD:	**0**
PERSONAL PROTECTION:	

NFPA® 704 CODES



Approximate HMIS and NFPA Risk Ratings Legend:
0 (Low or none); 1 (Slight); 2 (Moderate); 3 (Serious); 4 (Severe)

Application Instructions

Follow the procedure below for best results. For mixing quantities that are less than 1 mL in size or for stricter stoichiometry control, mix by weight ratio instead (requires a high precision balance). Heat cure is recommended to get the best possible conductivity.

To prepare 1:1 (A:B) epoxy mixture

1. Remove cap or cover.
2. Measure ***one*** part by volume of ***A***.
3. Measure ***one*** part by volume of ***B***.
4. Thoroughly mix the parts together with a stir stick until homogeneous.
5. Apply to with an appropriate sized stick for the application area.

NOTE: Remember to recap the syringe or container promptly after use.

TIP: Due to the high viscosity and abrasiveness of the filler, you may preheat part A and part B to increase the flow and improve air release, but this will decrease pot life. Note that the material viscosity decreases with mixing, so the material will be most liquid-like and easily applied immediately after being mixed.

To heat cure the 8329TCM epoxy

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

You can cure the epoxy faster by using higher temperatures of up to 160 °C [302 °F], which will provide a faster cure time of 7 min and optimum conductivity values.

TIP: Hair dryers are normally rated not to exceed 60 °C, so they can generally be used to accelerate the cure.

ATTENTION: Keep the curing temperature well below temperature limit of heat sensitive components that may be present. As a guideline, remember that commercial grade devices normally can be safely operated up to 70 °C, industrial grade up to 85 °C, and military grade up to 175 °C.

ATTENTION: Heat guns can easily exceed the temperature limits for your assembly: they should not be used.

To room temperature cure the 8329TCM epoxy

Let stand for 5 to 24 hours.

TIP: While the product can be cured at room temperature, the better conductive performance is achieved with heat curing.

Packaging and Supporting Products

Cat. No.	*Form*	*Net Volume*		*Net Weight*		*Shipping Weight*	
8329TCM-6ML	Paste	6 mL	0.2 fl oz	15 g	0.47 oz	400 g [a)]	0.9 lb [a)]
8329TCM-50ML	Paste	50 mL	1.7 fl oz	121 g	3.9 oz	2 kg [a)]	4.4 lb [a)]
8329TCM-200ML	Paste	200 mL	6.8 fl oz	486 g	15.6 oz	550 g	1.2 lb

a) Pack of ten

Technical Support

Contact us regarding any questions, improvement suggestions, or problems with this product. Application notes, instructions, and FAQs are located at www.mgchemicals.com.

Email: support@mgchemicals.com

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1-905-331-1396 Ext. 1030 (International)
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Warranty

M.G. Chemicals Ltd. warranties this product for 12 months from the date of purchase by the end user. *M.G. Chemicals Ltd.* makes no claims as to shelf life of this product for the warranty. The liability of *M.G. Chemicals Ltd.* whether based on its warranty, contracts, or otherwise shall in no case include incidental or consequential damage.

Disclaimer

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- Поставка более 17-ти миллионов наименований электронных компонентов;
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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.

Как с нами связаться

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