

Description

The 8330 *Silver Conductive Epoxy Adhesive: Moderate Cure / Extreme Conductivity* is a higher conductivity version of the 8331 *Silver Conductive Epoxy*. It is an electronic grade epoxy that combines moderate curing rate and high conductivity with ease of use. It has a convenient 1-to-1 ratio, a workable ten minutes working life, and a moderate curing rate. It achieves an operational level in five hours at room temperature. With heat, the 8330 cures in less than 15 minutes and maximizes its conductivity. The cured adhesive bonds very well to most substrates used in electronic assemblies; resists thermal and mechanical shocks; and provides the low resistivity needed for many operating conditions. The 8330 epoxy adhesive provides high conductivity seals, bonds, and repairs of electronic devices.

Applications & Usages

The 8330 epoxy has many uses. It is primarily used as a cold solder: a metal solder replacement for bonding heat-sensitive electronic components. It allows for quick cold soldering repairs, and is effective at bonding heat sinks to other components and PCBs. It also provides excellent EMI/RFI shielding, and is very effective at filling in seams between metal plates.

Its primary applications are repair and assembly of electronics in microelectronics and optoelectronics. It is used in the automobile, aerospace, marine communication, instrumentation, and industrial control equipment industries.

Benefits and Features

- **Excellent 0.0010 Ω·cm electrical resistivity and 1.6 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

Usage Parameters

Properties	Value
Working Life ^{a)}	10 min
Shelf Life	≥3 y
Service Cure @22 °C [72 °F]	6 h
Full Cure @22 °C [72 °F]	24 h
Full Cure @65 °C [149 °F]	20 min

a) Cure and life values 5 g and room temperature unless stated otherwise.

Temperature Ranges

Properties	Value
Constant Service Temp.	-55 to 150 °C [-67 to 302 °F]
Storage Temperature of Unmixed Parts	5 to 27 °C [41 to 80 °F]

Properties of Cured 8330

Physical Properties	Method	Value ^{a)}
Color	Visual	Silver Grey
Density @26 °C [79 °C]	ASTM D 1475	3.3 g/cm ³
Hardness	Shore D durometer	83D
Tensile Strength	ASTM D638-08	6.3 N/mm ² [910 lb/in ²]
Compressive Strength	ASTM D695-10	18 N/mm ² [2 700 lb/in ²]
Lap Shear Strength (Stainless Steel-grade 2)	ASTM D 1002	6.5 N/mm ² [940 lb/in ²]
Solderable	-	No
Electric Properties	Method	Value
Volume Resistivity ^{b)}	Method 5011.5 in MIL-STD-883H	0.0010 Ω·cm
Thermal Properties	Method	Value
Thermal Conductivity @25 °C [77 °F]	ASTM E 1461	1.63 W/(m·K)
@50 °C [122 °F]	"	1.79 W/(m·K)
@100 °C [212 °F]	"	1.65 W/(m·K)
Glass Transition Temperature (T _g)	ASTM D 3418	51 °C [124 °F]
CTE ^{c)} Prior T _g	ASTM E 831	91 ppm/°C
CTE ^{c)} After T _g	ASTM E 831	278 ppm/°C
Specific Heat @25 °C [77 °F]		0.558 J/(g·K)

Note: Specifications are for epoxy samples that were cured at 65 °C for 20 min. Additional curing time at room temperature was given to allow for optimum curing.

a) N/mm² = MPa; lb/in² = psi

b) The uncured epoxy mixture does not conduct electricity well and can have high resistance. To attain stated resistivity, ensure that the mix ratio is followed and that the product is fully cured by heat curing. Room temperature cures may give higher resistivity.

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

Properties of Uncured 8330

<i>Physical Property</i>	<i>Mixture (1A:1B)</i>	
Color	Silver Grey	
Density ^{a)}	3.30 g/mL	
Mix Ratio by Volume (A: B)	1.0: 1.0	
Solids Content (w/w)	100%	
<i>Physical Property</i>	<i>Part A</i>	<i>Part B</i>
Color	Silver Grey	Silver Grey
Density	3.40 g/mL	2.92 g/mL
Flash Point	>150 °C [302 °F]	>93 °C [200 °F]
Resistivity of Uncured Material	Off-scale (no reading)	Off-scale (no reading)

a) Calculated value based on measures densities of each part

Principal Components

Name

Part A: Epoxide Resin
Metallic Silver
Part B: Aliphatic Amines
Metallic Silver

CAS Number

28768-32-3, 17557-23-2
7440-22-4
140-31-8, 84852-15-3, 111-40-0, 68411-71-2, 80-05-7
7440-22-4

Compatibility

Adhesion—As seen in the substrate adhesion table, the 8330 epoxy adheres to most materials found on printed circuit assemblies; however, it is not compatible with contaminants like water, oil, and greasy flux residues that may affect adhesion. If contamination is present, clean the printed circuit assembly with electronic cleaner such as MG Chemicals 4050 Safety Wash, 406B Super Wash, or 824 Isopropyl Alcohol.

Substrate Adhesion in Decreasing Order

<i>Physical Properties</i>	<i>Adhesion</i>
Steel	Stronger  Weaker
Aluminum	
Fiberglass	
Wood	
Paper, Fiber	
Glass	
Rubber	
Polycarbonate	
Acrylic	
Polypropylene ^{a)}	

a) Does not bond to polypropylene

Storage

Store between 5 and 27 °C [41 and 80 °F] in dry area away from sunlight. Prolonged storage or storage at or near freezing temperatures can result in crystallization.

Tip! If stored at low temperatures, let the epoxy come back to room temperature before use. The lower the temperature, the harder the mixture will be to dispense and mix.

If crystallization occurs, reconstitute the component to its original state by temporarily warming it to 50 to 60 °C [122 to 140 °F]. To ensure full homogeneity, stir thoroughly the warm component, reincorporating all settled material. Re-secure container lid and let cool down before use.

Health, Safety, and Environmental Awareness

Please see the 8330 **Safety Data Sheet** (SDS) parts A and B for more details on transportation, storage, handling and other security guidelines.

Health and Safety: The 8330 parts can ignite if the liquid is heated and exposed to flames or sparks.

Wear safety glasses or goggles and disposable polyvinyl chloride, neoprene, or nitrile gloves while handling liquids. Part B in particular causes skin burns and may cause sensitization if exposed over a long period of time. The epoxy will not wash off once cured: wear protective work clothing. Wash hands thoroughly after use or if skin contact occurs. Do not ingest.

Use in well-ventilated area since vapors may cause irritation of the respiratory tract and cause respiratory sensitization in susceptible individuals.

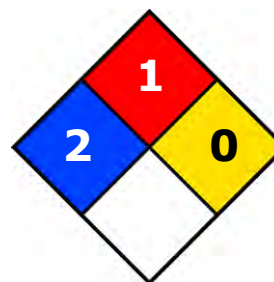
The cured epoxy resin presents no known hazard.

Part A

HMIS® RATING

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

NFPA® 704 CODES



Approximate HMIS and NFPA Risk Ratings Legend:

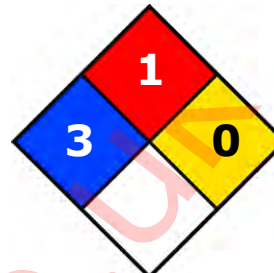
0 (Low or none); 1 (Slight); 2 (Moderate); 3 (Serious); 4 (Severe)

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. Heat cure is recommended to get the best possible conductivity.

Preparation

To ensure that the epoxy dispenses properly, ensure that the product is at room temperature.

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 silver filler, you may preheat part A and part B to increase the flow and improve air release.

To heat cure the 8330 epoxy

Put in oven at 65 °C [149 °F] for 20 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 8330 epoxy

Let stand for 24 hours or more.

TIP: While the product can be cured at room temperature, the best conductivity is achieved with the application of heat.

Packaging and Supporting Products

<i>Cat. No.</i>	<i>Form</i>	<i>Net Volume</i>		<i>Net Weight</i>		<i>Shipping Weight</i>	
8330-19G	Paste	6 mL	0.20 fl oz	18.9 g	0.67 oz	20 g	1.26 oz
8330-50ML	Paste	50 mL	1.69 fl oz	157 g	5.57 oz	0.17 kg	0.4 lb
8330-200ML	Paste	200 mL	6.76 fl oz	631 g	1.39 lb	0.62 kg	1.4 lb



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

Silver Conductive Epoxy Adhesive Moderate Cure / Extreme Conductivity 8330 Technical Data Sheet

8330

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

Phone: 1-800-340-0772 (Canada, Mexico & USA)
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Warranty

M.G. Chemicals Ltd. warrants 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.

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