

Description

This is a two-part, smooth, silver paste adhesive that cures to form a hard, durable polymer. In its cured state, it is extremely electrically and thermally conductive. It adheres strongly to metals, glass, and it adheres well to most plastics used in electronic assemblies.

It has a convenient 1-to-1 mix ratio, and a 10 minute working life. It achieves an operational cure in five hours at room temperature and full cure in a day. At 65 °C, it cures in only 20 minutes.

Applications & Usages

The 8330 is used as a solder replacement for bonding heat-sensitive electronic components and for making conductive bonds where solder is not an option, such as when bonding to glass, soft metals or plastics. It allows for quick cold soldering repairs of electronic devices, makes excellent thermal connections, provides excellent EMI/RFI shielding, and is very effective at filling in seams between metal plates. It is especially useful in repairing rear window defrosters on automobiles.

Its primary applications are in the repair and assembly of electronic devices. It is used in the automobile, aerospace, marine, communication, instrumentation, and industrial control equipment industries. It is also widely used by hobbyists and makers.

Benefits and Features

- **Electrical resistivity: 0.0010 Ω·cm**
- **Thermal conductivity: 1.6 W/(m·K)**
- **1:1 mix ratio by volume**
- **Working life: 10 minutes**
- **Cure time: 24 hours at room temperature or 20 minutes at 65 °C**
- **Good adhesive strength**
- **Strong resistance to water, brine, acids, bases, and aliphatic hydrocarbons**
- **Room temperature storage**
- **Shelf life greater than three years**

ENVIRONMENT

- ✓ RoHS
- ✓ REACH compliant

Usage Parameters

<i>Properties</i>	<i>Value</i>
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

<i>Properties</i>	<i>Value</i>
Constant Service Temp.	-55 to 150 °C [-67 to 302 °F]
Storage Temperature of Unmixed Parts	16 to 27 °C [60 to 80 °F]

Principal Components

Name	CAS Number
Part A: Epoxide Resin	28768-32-3, 17557-23-2
Metallic Silver	7440-22-4
Part B: Aliphatic Amines	140-31-8, 84852-15-3, 111-40-0, 68411-71-2, 80-05-7
Metallic Silver	7440-22-4

Properties of Cured 8330

<i>Physical Properties</i>	<i>Method</i>	<i>Value</i> ^{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]
Young's Modulus	"	10.4 GPa [1 500 000 lb/in ²]
Compressive Strength	ASTM D695-10	21 N/mm ² [3 000 lb/in ²]
Lap Shear Strength (Stainless Steel-grade 2)	ASTM D 1002	6.5 N/mm ² [940 lb/in ²]
Lap Shear Strength (Aluminum)	ASTM D 1002	5.4 N/mm ² [780 lb/in ²]
Solderable	-	No
<i>Electric Properties</i>	<i>Method</i>	<i>Value</i>
Volume Resistivity ^{b)}	Method 5011.5 in MIL-STD-883H	0.0010 Ω·cm
<i>Thermal Properties</i>	<i>Method</i>	<i>Value</i>
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	
Mix Ratio by Volume (A:B)	1.16:1.0	
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

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	
Aluminum		
Fiberglass		
Wood		
Paper, Fiber		
Glass		
Rubber		
Polycarbonate		
Acrylic		
Polypropylene ^{a)}		Weaker

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.

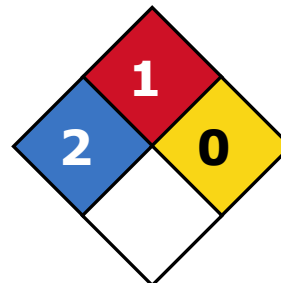
The cured epoxy resin presents no known hazard.

Part A

HMIS® RATING

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

NFPA® 704 CODES



Approximate HMIS and NFPA Risk Ratings Legend:

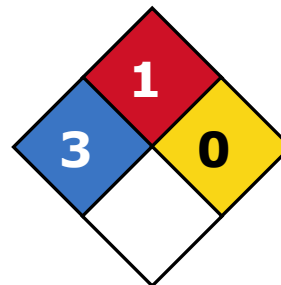
0 (Low or none); 1 (Slight); 2 (Moderate); 3 (Serious); 4 (Severe)

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. For mixing quantities that are less than 1 mL 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.

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. For jars, stir each part individually to re-incorporate material that may have separated during storage.
3. Measure **one** part by volume of **A**.
4. Measure **one** part by volume of **B**.
5. Thoroughly mix the parts together with a stir stick until homogeneous.
6. Apply to with an appropriate sized stick for the application area.

CAUTION!

Do not cross contaminate.
To avoid premature curing,
use different stirring tools
for parts A & B.

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.



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

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

8330

Packaging and Supporting Products

<i>Cat. No.</i>	<i>Packaging</i>	<i>Net Volume</i>		<i>Net Weight</i>		<i>Packaging Weight</i>	
8330-19G	Syringe	6 mL	0.20 fl oz	18.9 g	0.67 oz	40 g	1.4 oz
8330-50ML	Jar	50 mL	1.69 fl oz	157 g	5.57 oz	170 g	0.4 lb
8330-200ML	Can	200 mL	6.76 fl oz	631 g	1.39 lb	820 g	1.8 lb

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)

+ (1) 905-331-1396 (International)

Fax: +(1) 905-331-2862 or +(1) 800-340-0773

Mailing address:

Manufacturing & Support

1210 Corporate Drive
Burlington, Ontario, Canada
L7L 5R6

Head Office

9347-193rd Street
Surrey, British Columbia, Canada
V4N 4E7

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.

Disclaimer

This information is believed to be accurate. It is intended for professional end users having the skills to evaluate and use the data properly. *M.G. Chemicals Ltd.* does not guarantee the accuracy of the data and assumes no liability in connection with damages incurred while using it.