



# MATERIAL SAFETY DATA SHEET

## SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT:** M-Bond GA-2 Resin

November 28, 2005

Vishay Micro-Measurements  
Post Office Box 27777  
Raleigh, NC 27611

**MSDS #** MGM015H

919-365-3800

CHEMTREC 1-800-424-9300 (U.S.)  
703-527-3887 (Outside U.S.)

NOTE: CHEMTREC numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

## SECTION 2: HAZARDOUS INGREDIENTS / IDENTITY INFORMATION

CAS NUMBER	CHEMICAL IDENTITY	%
30499-70-8	2-Ethyl-2-(hydroxymethyl)-1,3- Propanediol polymer with (chloromethyl)oxirane	30.0
*25068-38-6	4,4'-(1-methylethylidene) bisphenol polymer with (chloromethyl)oxirane	30.0
1317-61-9	Iron Oxide	5.0
1317-65-3	Limestone	33.0
7631-86-9	Silica	2.0
106-89-8	Epichlorohydrin	<0.01

\*NOTE: CAS # 25068-38-6 is an epoxy resin produced by the condensation reaction of epichlorohydrin and bisphenol A. These raw materials are consumed in the process. Residual levels of epichlorohydrin, if any, are typically 2-3 ppm in the product.

**SECTION 3: HEALTH HAZARD DATA****Routes of Entry:**

**Inhalation:** YES    **Skin:** Possible    **Ingestion:** Accidental

**Health Hazards (Acute and Chronic):** No specific information available. Epichlorohydrin has been reported to produce cancer in laboratory animals and epidemiological studies present weak evidence of cancer risk to humans.

<b>Carcinogenicity:</b>	NTP:	See Note
	IARC Monographs:	See Note
	OSHA Regulated:	Not listed

**NOTE:** This material contains small amounts of epichlorohydrin (ECH) which has been reported to cause cancer in laboratory animals and mutagenic changes in bacteria and cultured human cells. Ongoing studies of human workers exposed to ECH have been reported to show weak evidence that exposure to ECH poses a cancer risk to humans. It is highly unlikely that proper usage of this product will entail significant exposure to ECH, but good personal hygiene, minimal skin contact, and avoidance of vapors are necessary precautions especially if heated. Epichlorohydrin is listed by NTP and IARC.

**Signs and Symptoms of Exposure:**

**INHALATION:** Heating will produce hazardous polymerization and toxic gases in large masses. Heating can also generate vapors that could cause headache, nausea, dizziness, and respiratory irritation if inhaled.

**EYE CONTACT:** May cause severe eye injury. Vapors may cause minor injury which may persist for several days.

**SKIN CONTACT:** May cause moderate skin injury (reddening and swelling). Sensitizer; may cause allergic reaction. Primary source of entry may be skin but as of yet this has not been proven.

**INGESTION:** No specific information is available. Contains materials which may be slightly toxic.

**Conditions Generally Aggravated by Exposure:** Not known.

**SECTION 4: EMERGENCY AND FIRST AID PROCEDURES**

**INHALATION:** Move to fresh air if symptoms occur. If breathing has stopped, give artificial respiration. Keep affected person warm and at rest. Seek medical attention.

**EYE CONTACT:** Immediately flush with large amounts of water for at least 15 minutes. Contact a physician immediately.

**SKIN CONTACT:** Remove contaminated clothing. Wash affected area with soap and water and flush with water for at least 15 minutes. Contact physician if irritation persists.

**INGESTION:** Call a physician or poison control center immediately.

#### SECTION 5: FIRE AND EXPLOSION HAZARD DATA

**Flash Point (Method Used):** >200°F (>93°C) Setaflash

**Flammable limits:** LEL: N/E UEL: N/E

**Extinguishing Media:** Water spray, carbon dioxide, or dry chemical for small fires. Use alcohol type foam for large fires.

**Special Firefighting Procedures:** Firefighters should wear positive pressure, self-contained breathing apparatus and full protective clothing. Avoid breathing smoke.

**Unusual Fire and Explosion Hazards:** Keep non-ignited material cool with water spray. Beware of possible exothermic reaction if the material is heated >400°F (>204°C) in a container containing greater than 1 gallon of material.

#### SECTION 6: ACCIDENTAL RELEASE MEASURES

**Steps to be taken if material is released or spilled:** Observe precautions from other sections. Collect spilled material and clean up the residue with an inert, absorbent material (sand, vermiculite, etc.) Flush area with water. Prevent water washings from entering waterways. Place in a DOT approved metal container and seal.

#### SECTION 7: EXPOSURE CONTROLS -- PERSONAL PROTECTION

**Respiratory Protection:** Mechanical ventilation may be acceptable when small amounts are used at room temperature. If TLV's are exceeded, however, local ventilation or a NIOSH organic fume respirator is recommended.

##### Ventilation:

**Local Exhaust:** Keep below TLV

**Mechanical:** Keep below TLV

**Special:** Vent curing ovens outdoors.

**Other:** N/A

**NOTE:** This product contains mineral fillers in a completely wetted, non-airborne form. Some components of these fillers are classified as hazards in their airborne form. If cured and machined, cut, sanded, or otherwise handled in such a way as to release particles into the air, proper care should be taken to not inhale the dust. In such cases a NIOSH approved particulate respirator should be worn during these operations.

**Protective Gloves:** Impervious latex or rubber gloves are recommended.

**Eye Protection:** Safety glasses or goggles are recommended.

**Other Protective Clothing or Equipment:** For operations where skin contact can occur, coveralls, apron and rubber foot coverings are recommended. A safety shower and eye wash facility should be available.

**Work / Hygienic Practices:** Wash thoroughly after using. Clothing contaminated with this material should be washed before reusing. Severely contaminated clothing should be discarded.

## SECTION 8: HANDLING AND STORAGE

**Precautions to be taken in handling and storing:** Store at 85°F (30°C) or below. Avoid eye and skin contact. Do not wear contact lenses while using or in the vicinity in which this product is being used.

**Other Precautions:** None Known.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

<b>Boiling Point:</b>	>500°F (>260°C)
<b>Vapor Pressure (mmHg):</b>	<0.1 at 68°F (20°C)
<b>Vapor Density (Air = 1):</b>	Heavier than air
<b>Specific Gravity (H<sub>2</sub>O = 1):</b>	1.51
<b>Melting Point:</b>	Not known
<b>Evaporation Rate (BuAc = 1):</b>	<1
<b>Volatile Organic Compounds:</b>	Nil
<b>Solubility in Water:</b>	Very slight

**Appearance and Odor:** Black liquid with mild ether odor.

## SECTION 10: STABILITY AND REACTIVITY DATA

**Stability:** Stable.

**Conditions to Avoid:** Excessive heat.

**Incompatibility (Materials to Avoid):** Uncontrolled exposure to strong oxidizing agents, acids, mercaptans, bases or amines especially in over 1 pound masses.

**Hazardous Decomposition or By-products:** Nitrogen oxides, carbon dioxide, carbon monoxide, aldehydes, and other hazardous organics.

**Hazardous Polymerization:** Will not ordinarily occur. May occur if stored at elevated temperature >400°F (>204°C) especially in quantities greater than one pound.

<b>SECTION 11: TOXICOLOGICAL INFORMATION</b>
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## 2-Ethyl-2-(hydroxymethyl)-1,3-Propanediol polymer with (chloromethyl)oxirane

OSHA PEL:	N/E
ACGIH TLV:	N/E
OTHER:	N/E

## 4,4'-(1-methylethylidene)bisphenol polymer with (chloromethyl)oxirane

OSHA PEL:	N/E
ACGIH TLV:	N/E
OTHER:	ORAL (RAT) LD <sub>50</sub> 11.4 g/kg ORAL (MOUSE) LD <sub>50</sub> 15.6 g/kg SKIN (RABBIT) LD <sub>50</sub> >20 ml/kg

## Iron oxide

OSHA PEL:	5mg/m <sup>3</sup> (in airborne dust)
ACGIH TLV:	N/E
OTHER:	N/E

## Limestone

OSHA PEL:	5mg/m <sup>3</sup> (in airborne dust)
ACGIH TLV:	N/E
OTHER:	N/E

## Silica

OSHA PEL:	3mg/m <sup>3</sup> (in airborne dust)
ACGIH TLV:	N/E
OTHER:	N/E

## Epichlorohydrin

OSHA PEL:	2 ppm SKIN
ACGIH TLV:	2 ppm Skin
OTHER:	Potential contribution to overall exposure is possible by skin exposure.

<b>SECTION 12: DISPOSAL CONSIDERATIONS</b>
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**Waste Disposal Method:** Incinerate or use biological treatment in accordance with federal, state and local regulations. This material is defined as non-hazardous under current RCRA regulations.

<b>SECTION 13: TRANSPORTATION INFORMATION</b>
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SHIPPING NAME	CLASS	PACKING GROUP	UN NUMBER
Toxic Liquid organic, N.O.S (2-Ethyl-2-(hydroxymethyl)-1, 3-Propanediol polymer with (chloromethyl)oxirane)	6.1	II	2810

<b>SECTION 14: REGULATORY INFORMATION</b>
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**SECTION 313 SUPPLIER NOTIFICATION:**

This product contains a toxic chemical or chemicals (as listed below) subject to the reporting requirements of Section 313 Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR Part 372.

CAS NUMBER	CHEMICAL NAME	% BY WEIGHT
Not listed.		

**TSCA NOTIFICATION:**

All components of this product are listed in the Toxic Substance Control Act Chemical Substance Inventory (TSCA).

<b>SECTION 15: OTHER INFORMATION</b>
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To the best of our knowledge, the information provided above meets the requirements of the United States Occupational Safety and Health Act and regulations established under 29 CFR 1910.1200 (g)(2)(c)(1)-(4) for a mixture of hazardous chemicals which has not been tested as a whole. The data provided on this Material Safety Data Sheet is from manufacturers of the original components. Vishay Micro-Measurements specifically disclaims any and all form of liability and/or responsibility for the application of this product.