



MATERIAL SAFETY DATA SHEET

SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT: M-Bond AE Resin

November 29, 2005

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

MSDS # MGM014L

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	%
1675-54-3 & 25085-99-8	Reaction products of Epichlorohydrin and Bisphenol-A (Epoxy Resin)	93.0
122-60-1	Phenyl Glycidyl Ether	4.0
108-46-3	m-Dihydroxybenzene	3.0
106-89-8	Epichlorohydrin*	5 ppm

*NOTE: This material can be present as a residual from Phenyl Glycidyl Ether and Epoxy Resin manufacturing. Further studies may establish a carcinogenic effect of this material on the human.

SECTION 3: HEALTH HAZARD DATA

Routes of Entry:

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

Health Hazards (Acute and Chronic): May cause irritation. Long-term skin exposure may cause burns.

Carcinogenicity: NTP: Not listed*
IARC Monographs: Not listed*
OSHA Regulated: Not listed

*This product contains trace (5 ppm) residual quantities of Epichlorohydrin (ECH), CAS #106-89-8. ECH has been reported to produce cancer in laboratory animals and to produce mutagenic changes in bacteria and cultured human cells. It has been classified by the International Agency for Research on Cancer (IARC) as a possible human carcinogen (IARC Group 2A) based on the following conclusions: Human evidence - Inadequate; Animal Evidence - Sufficient. It has been classified as an anticipated human carcinogen by the National Toxicology Program (NTP).

Signs and Symptoms of Exposure:

INHALATION: May cause irritation to the nose, throat and respiratory tract. May cause central nervous system depression.

EYE CONTACT: May cause irritation, burning sensation, and reddening of the eye. May cause moderate to severe irritation with possibility of permanent damage if left untreated.

SKIN CONTACT: May be slightly corrosive to the skin. Repeated exposure may cause skin irritation and possible allergic reaction.

INGESTION: No hazard anticipated from ingestion incidental to industrial exposure. However, this product contains 3.0% Resorcinol (m-Dihydroxybenzene). Resorcinol, in its pure form, is considered to be Toxic by ingestion and may be a poison to both blood and nerves. Ingestion of Resorcinol may cause gastrointestinal upset and other symptoms and effects such as sweating, weakness, headache, dizziness, cyanosis, spleen, liver and kidney damage, cardiovascular damage, and possibly convulsions and death.

Medical Conditions Generally Aggravated by Exposure: Allergic skin reaction and dermatitis in sensitive individuals.

SECTION 4: EMERGENCY AND FIRST AID PROCEDURES

INHALATION: Remove victim to fresh air and provide oxygen if breathing is difficult. Give artificial respiration if breathing has stopped. Get medical attention.

EYE CONTACT: Immediately flush eyes with plenty of water for 15 minutes while holding eyelids open. Consult physician or ophthalmologist if irritation persists.

SKIN CONTACT: Flush skin with water while removing contaminated clothing. Wash affected area with soap and water and flush with clean water. Do not reuse clothing. Leather articles, including shoes, cannot be decontaminated and should be destroyed to prevent reuse. Consult physician.

INGESTION: Give large amounts of water or milk. Do NOT induce vomiting unless directed to do so by a physician. Transport to a medical facility.

NOTE TO PHYSICIAN: No specific antidote. Provide supportive care. Treatment should be based on the judgement of the physician in response to reactions of the patient.

SECTION 5: FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method Used): 200°F (93°C) PMCC (Based on flashpoint for PGE)

Flammable limits: LEL: Unknown UEL: Unknown

Extinguishing Media: Carbon dioxide, dry chemical, foam.

Special Firefighting Procedures: In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

Unusual Fire and Explosion Hazards: Use water spray to cool fire exposed containers and fire affected area until fire is out and danger of re-ignition is passed. Sealed containers may rupture when heated.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Steps to be taken if material is released or spilled: Soak up in absorbent material such as sand and collect in suitable containers. Residual resin may be removed using steam or hot soapy water. Solvents are not recommended for clean up. Keep spark producing equipment away. For large spills, evacuate upwind of spills and contain with dike.

SECTION 7: EXPOSURE CONTROLS -- PERSONAL PROTECTION

Respiratory Protection: If exposure exceeds occupational exposure limits, use a NIOSH-approved respirator. A system of local and/or general exhaust is recommended to keep employee exposures below the airborne exposure limit.

Ventilation:

Local Exhaust: Local exhaust ventilation is generally preferred because it can control the emission at the source.

Mechanical: Keep below TLV.

Special: N/A

Other: N/A

Protective Gloves: Neoprene or polyethylene gloves recommended.

Eye Protection: Chemical safety glasses recommended.

Other Protective Clothing or Equipment: Neoprene or polyethylene apron as needed to prevent skin contact. Safety shower and eye wash station should be available for emergency use.

Work / Hygienic Practices: Wash thoroughly with soap and water after handling.

SECTION 8: HANDLING AND STORAGE

Precautions to be taken in handling and storing: Store below 80°F (27°C) in a dry place. Keep away from open flames and high temperatures. Avoid prolonged breathing of vapors and skin and eye contact.

Other Precautions: Keep containers tightly capped.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point:	N/A
Vapor Pressure (mmHg):	1 @ 226°F (118°C)
Vapor Density (Air = 1):	>3.8
Specific Gravity (H₂O = 1):	1.15
Melting Point:	N/A
Evaporation Rate (BuAc = 1):	N/A
Volatile Organic Compounds:	None
Solubility in Water:	Negligible

Appearance and Odor: Amber to clear liquid; faint epoxy odor

SECTION 10: STABILITY AND REACTIVITY DATA

Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Excess heating over a period of time degrades the resin.

Incompatibility (Materials to Avoid): Strong oxidizing agents, strong Lewis or mineral acids, and strong mineral and organic bases, especially primary and secondary aliphatic amines.

Hazardous Decomposition or By-products: The by-products expected in incomplete pyrolysis or combustion of epoxy resins are mainly phenolics, carbon monoxide and water. The thermal decomposition products of epoxy resins therefore should be treated as potentially hazardous substances, and appropriate precautions should be taken.

Hazardous Polymerization: Will not occur under normal temperature and pressure.

SECTION 11: TOXICOLOGICAL INFORMATION
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Reaction products of Epichlorohydrin and Bisphenol-A
(Epoxy Resin)

OSHA PEL:	Not known
ACGIH TLV:	Not known
OTHER:	LD ₅₀ ORAL (RAT) >5000 mg/kg LD ₅₀ SKIN (RABBIT) 20,000 mg/kg

m-Dihydroxybenzene

OSHA PEL:	10 ppm (TWA)
ACGIH TLV:	10 ppm (TWA)
OTHER:	20 ppm (STEL)

Phenyl Glycidyl Ether

OSHA PEL:	1 ppm (TWA)
ACGIH TLV:	1 ppm (TWA)
OTHER:	LD ₅₀ ORAL (RAT) 3.85 g/kg LD ₅₀ ORAL (MOUSE) 1.40 g/kg LD ₅₀ SKIN (RAT) 2.16 g/kg LD ₅₀ SKIN (MOUSE) 2.99 g/kg LC ₅₀ INHALATION (RAT) >100 ppm (8 HR) LC ₅₀ INHALATION (MOUSE) >100 ppm (4 HR)

Epichlorohydrin

OSHA PEL:	2 ppm (TWA)
ACGIH TLV:	2 ppm (TWA)

SECTION 12: DISPOSAL CONSIDERATIONS
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Waste Disposal Method: Any disposal practice must be in compliance with all federal, state, and local laws and regulations.

SECTION 13: TRANSPORTATION INFORMATION

SHIPPING NAME	CLASS	PACKING GROUP	UN NUMBER
Toxic liquid, organic, N.O.S. (Bisphenol-A) Toxic	6.1	III	2810

SECTION 14: REGULATORY INFORMATION**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
106-89-8	Epichlorohydrin	5 ppm

TSCA NOTIFICATION:

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

SECTION 15: OTHER INFORMATION

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.