



# MATERIAL SAFETY DATA SHEET

## SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT:** M-Bond 610 Adhesive

October 21, 2005

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

**MSDS #** MGM012K

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	%
109-99-9	Tetrahydrofuran	58.0-64.4
28064-14-4	Epoxy Novolac	26.7-30.3
78-93-3	Methyl Ethyl Ketone	5.3-8.9

## SECTION 3: HEALTH HAZARD DATA

### Routes of Entry:

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

**Health Hazards (Acute and Chronic):** Chronic over-exposure may result in kidney and/or liver damage.

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

**Signs and Symptoms of Exposure:**

**INHALATION:** Excessive exposure to solvents may cause respiratory irritation and central nervous system depression. Signs and symptoms of central nervous system depression, in order of increasing exposure, are headache, dizziness, drowsiness, and incoordination. Signs and symptoms of excessive exposure may be nausea and/or vomiting.

**EYE CONTACT:** May cause severe irritation or burns. May cause pain on contact. Vapors may irritate eyes.

**SKIN CONTACT:** May cause severe irritation or burns. Absorption into the skin may cause dermatitis. Repeated contact may cause drying or flaking of skin. May rarely cause an allergic skin reaction.

**INGESTION:** May cause headache, nausea, vomiting, dizziness, gastrointestinal irritation.

**Medical Conditions Generally Aggravated by Exposure:** Skin disorders, respiratory system disease.

<b>SECTION 4: EMERGENCY AND FIRST AID PROCEDURES</b>
--

**INHALATION:** If inhaled, move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

**EYE CONTACT:** In case of eye contact, immediately flush eyes with plenty of water for at least 15 minutes while holding eyelids open.

**SKIN CONTACT:** In case of contact, flush skin with water while removing contaminated clothing. Wash affected area with soap and water. Launder contaminated clothing before reuse.

**INGESTION:** Call a physician. If swallowed, do **NOT** induce vomiting unless directed to do so by a physician. If conscious, give large amounts of water.

<b>SECTION 5: FIRE AND EXPLOSION HAZARD DATA</b>
--

**Flash Point (Method Used):** 6°F (-14°C) PMCC

**Autoignition Temperature:** 610°F (320°C)

**Flammable limits:** LEL: 1.8 UEL: 11.8

**Extinguishing Media:** Alcohol foam, dry chemical, carbon dioxide. Water may be ineffective.

**Special Firefighting Procedures:** Firefighters should wear proper protective equipment and self-contained breathing apparatus with full facepiece operated in the positive pressure mode. Move containers from fire area if it can be done without risk. Use water to keep fire-exposed containers cool.

**Unusual Fire and Explosion Hazards:** Vapors may flow along surfaces to distant ignition source and flash back. Closed containers exposed to heat may explode. Contact with strong oxidizers may cause fire. May form explosive peroxides, especially when heated.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

**Steps to be taken if material is released or spilled:** Keep unnecessary people away; isolate hazard area. Wear self-contained breathing apparatus and full protective clothing. Shut off ignition sources; no flares, smoking or flames in area. Stop leak if you can do so without risk. Keep out of storm drains, surface waters and soil. Use water spray to reduce vapors. Take up with sand or other non-combustible absorbent material and place into container for later disposal. Flush area with water.

## SECTION 7: EXPOSURE CONTROLS -- PERSONAL PROTECTION

**Respiratory Protection:** Respiratory protection required if airborne concentration exceeds TLV. At concentrations up to 1000 ppm, a chemical cartridge respirator with organic vapor cartridge is recommended. Above this level, a self-contained breathing apparatus is recommended.

**Ventilation:** Use only with adequate ventilation.

**Local Exhaust:** Keep below TLV

**Mechanical:** Keep below TLV

**Special:** N/E

**Other:** N/E

**Protective Gloves:** Use gloves impervious to this material when prolonged or frequently repeated contact could occur. Neoprene gloves recommended.

**Eye Protection:** Chemical splash goggles recommended.

**Other Protective Clothing or Equipment:** Impervious over-clothing as needed to prevent skin contact. Safety shower and eye wash station in local area.

**Work / Hygienic Practices:** Wash thoroughly after using.

## SECTION 8: HANDLING AND STORAGE

**Precautions to be taken in handling and storing:** Keep containers tightly closed. Store in a cool, dry, well-ventilated, flammable liquid storage area. Take precautionary measures against static discharges. Keep away from open flames and spark producing equipment. Keep product out of light.

**Other Precautions:** Keep containers tightly sealed when not in use. Bond and ground containers when transferring liquid. Use caution when opening cap. Avoid prolonged exposure to vapors and skin contact. Avoid breathing vapors.

<b>SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES</b>
--

<b>Boiling Point:</b>	150°F (66°C)
<b>Vapor Pressure (mmHg):</b>	129 @ 68°F (20°C)
<b>Vapor Density (Air = 1):</b>	2.4
<b>Specific Gravity (H<sub>2</sub>O = 1):</b>	0.9
<b>Melting Point:</b>	N/A
<b>Evaporation Rate (BuAc = 1):</b>	8.0
<b>Volatile Organic Compounds:</b>	712 g/liter
<b>Solubility in Water:</b>	Appreciable (more than 50%)

**Appearance and Odor:** Colorless liquid; ether-like odor.

<b>SECTION 10: STABILITY AND REACTIVITY DATA</b>
--

**Stability:** Stable.

**Conditions to Avoid:** Heat, flame, other sources of ignition, light and air. Avoid subjecting resin to temperatures above 90°F/32°C due to presence of volatile methyl ethyl ketone.

**Incompatibility (Materials to Avoid):** Acids, strong oxidizing agents, strong bases, strong reducing agents.

**Hazardous Decomposition or By-products:** Carbon monoxide, carbon dioxide explosive peroxides, phenolics.

**Hazardous Polymerization:** Will not occur by itself, but masses of more than one pound of product plus an aliphatic amine will cause irreversible polymerization with considerable heat buildup.

<b>SECTION 11: TOXICOLOGICAL INFORMATION</b>
--

Tetrahydrofuran

OSHA PEL:	200 ppm (TWA)
ACGIH TLV:	200 ppm
OTHER:	250 ppm (STEL)
	LD <sub>50</sub> IPR (RAT) 2900 mg/kg
	LC <sub>50</sub> INHAL (RAT) 78g/m <sup>3</sup>

Epoxy Novolac

OSHA PEL:	Not established
ACGIH TLV:	Not established
OTHER:	LD <sub>50</sub> SKIN (RABBIT) >2000 mg/kg
	LD <sub>50</sub> ORAL (RAT) >4000 mg/kg

## Methyl Ethyl Ketone

OSHA PEL:	200 ppm (TWA)
ACGIH TLV:	200 ppm
OTHER:	300 ppm (STEL)
	LD <sub>50</sub> ORAL (RAT) 2737 mg/kg
	LD <sub>50</sub> IPR (MOUSE) 616 mg/kg
	LD <sub>50</sub> SKIN (RABBIT) 13 g/kg

<b>SECTION 12: DISPOSAL CONSIDERATIONS</b>
--

**Waste Disposal Method:** Do not dump into any sewers, on the ground, or into any body of water. All disposal methods must be in accordance with all local, state and federal environmental regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility of the waste generator.

<b>SECTION 13: TRANSPORTATION INFORMATION</b>
---

SHIPPING NAME	CLASS	PACKING GROUP	UN NUMBER
Flammable Liquids, N.O.S. (Tetrahydrofuran/Ethyl Methyl Ketone) (Methyl Ethyl Ketone) Flammable Liquid	3	II	1993

<b>SECTION 14: REGULATORY INFORMATION</b>
---

**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
78-93-3	Methyl Ethyl Ketone	5.3-8.9

**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.