SAFETY DATA SHEET

Version: 5.0
Date of Issue: 07 July 2021
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ACCORDING TO OSHA HCS (29 CFR 1910.1200)

SECTION 1: IDENTIFICATION

Product identifier used on the label M-Bond AE Resin

Other means of identification Not applicable

Recommended use of the chemical and restrictions on use

Recommended use: Adhesives.
Restrictions on use: None known.

Details of the supplier of the safety data sheet

Supplier: VISHAY MEASUREMENTS GROUP, INC.
Address of Supplier: Post Office Box 27777
Raleigh, NC 27611
USA
Telephone: +1 919-365-3800
Fax: +1 919-365-3945
E-Mail (competent person): mm.us@vishaypg.com

Emergency telephone number 1-800-424-9300 CHEMTREC (24 hours)

SECTION 2: HAZARD(S) IDENTIFICATION

Classification of the substance or mixture in accordance with paragraph (d) of 29 CFR 1910.1200

Physical hazards Not classified

Health hazards:
Skin Corrosion/Irritation, Category 2
Skin Sensitisation, Category 1
Eye Damage, Category 1
Germ cell mutagenicity, Category 2
Specific target organ toxicity — single exposure, Category 1
Specific target organ toxicity — single exposure, Category 2

Environmental hazards: Hazardous to the aquatic environment, Chronic, Category 2

Hazard Symbol

Signal Word(s): DANGER

Hazard Statement(s):
Causes skin irritation.
May cause an allergic skin reaction.
Causes serious eye damage.
Suspected of causing genetic defects.
Causes damage to organs (CNS and blood effects - Oral).
May cause damage to organs (Respiratory tract - Oral).
Toxic to aquatic life with long lasting effects.

Precautionary Statement(s):
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe vapour.
Wash hands and exposed skin thoroughly after handling.
Wear protective gloves/protective clothing/eye protection/face protection.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a POISON CENTER/doctor.
IF ON SKIN: Wash with plenty of water.
If skin irritation or rash occurs: Get medical advice/attention.
IF exposed: Call a POISON CENTER or doctor/physician.
Avoid release to the environment.

Other hazards None known

Percent of the mixture consists of ingredient(s) of unknown acute toxicity: 0%

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Substances - Not applicable

Mixtures - Substances in preparations / mixtures

Chemical identity of the substance	%W/W	CAS No.	EC No.	Hazard classification
Bis-[4-(2,3-epoxipropoxi)phenyl] propane	< 75	1675-54-3	216-823-5	Skin Corrosion/Irritation, Category 2 Skin Sensitisation, Category 1 Eye Irritation, Category 2 Hazardous to the aquatic environment, Chronic, Category 2
Bisphenol A Diglycidyl Ether	15 – 25	25085-99-8	-	Skin Corrosion/Irritation, Category 2 Skin Sensitisation, Category 1 Eye Irritation, Category 2 Hazardous to the aquatic environment, Chronic, Category 2
2,3-Epoxypropyl o-tolyl ether	< 5	2210-79-9	218-645-3	Skin Corrosion/Irritation, Category 2 Skin Sensitisation, Category 1 Germ cell mutagenicity, Category 2 Hazardous to the aquatic environment, Chronic, Category 2
Resorcinol	< 5	108-46-3	203-585-2	Acute toxicity, Category 4 – Oral Skin Corrosion/Irritation, Category 2 Eye Damage, Category 1 Skin Sensitisation, Category 1B Specific target organ toxicity — single exposure, Category 1 Specific target organ toxicity — single exposure, Category 2 Hazardous to the aquatic environment, Acute, Category 1 Hazardous to the aquatic environment, Chronic, Category 3

SECTION 4: FIRST AID MEASURES

Description of first aid measures

Self-protection of the first aider — Use personal protective equipment as required. Wear appropriate personal protective equipment, avoid direct contact. Ensure adequate ventilation. Avoid all contact. Do not breathe vapour.

Inhalation — IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF exposed or concerned: Get medical advice/attention.

Skin Contact — IF ON SKIN: Remove contaminated clothing and wash all affected areas with plenty of water. If irritation (redness, rash, blistering) develops, get medical attention. IF exposed or concerned: Get medical advice/attention.

Eye Contact	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
Ingestion	IF SWALLOWED: Rinse mouth. Make victim drink plenty of water. Do not induce vomiting unless instructed to do so by medical personnel. Call a POISON CENTER/doctor if you feel unwell. IF exposed or concerned: Get medical advice/attention.
Most important symptoms and effects, both acute and delayed	Causes skin irritation. May cause an allergic skin reaction. Causes serious eye damage. Suspected of causing genetic defects. Causes damage to organs (CNS and blood effects - Oral). May cause damage to organs (Respiratory tract - Oral).
Indication of any immediate medical attention and special treatment needed	Treat symptomatically.
Notes to a physician:	IF IN EYES: Obtain prompt consultation, preferably from an ophthalmologist. Following severe exposure the patient should be kept under medical review for at least 48 hours.

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing media	
Suitable Extinguishing Media	As appropriate for surrounding fire. Extinguish with carbon dioxide, dry chemical, foam or waterspray.
Unsuitable extinguishing Media	Do not use water jet. Direct water jet may spread the fire.
Special hazards arising from the substance or mixture	May decompose in a fire giving off toxic fumes. Decomposes in a fire giving off toxic fumes: Phenolics, Carbon monoxide and Carbon dioxide.
Special protective equipment and precautions for fire fighters	Fire fighters should wear complete protective clothing including self-contained breathing apparatus. Do not breathe fumes. Keep containers cool by spraying with water if exposed to fire. Avoid run off to waterways and sewers.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	Ensure adequate ventilation. Stop leak if safe to do so. Use personal protective equipment as required. Wear appropriate personal protective equipment, avoid direct contact. Do not breathe vapour. Avoid all contact. Do not ingest. If swallowed then seek immediate medical assistance. Isolate the area and allow vapours to disperse.
Environmental precautions	Avoid release to the environment. Do not allow to enter drains, sewers or watercourses. Spillages or uncontrolled discharges into watercourses must be alerted to the Environment Agency or other appropriate regulatory body.
Methods and material for containment and cleaning up	Adsorb spillages onto sand, earth or any suitable adsorbent material. Transfer to a container for disposal. Ventilate the area and wash spill site after material pick-up is complete. Dispose of this material and its container as hazardous waste

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling	Avoid all contact. Do not breathe vapour. Ensure adequate ventilation. Wear appropriate personal protective equipment, avoid direct contact. Use personal protective equipment as required. See Section: 8. Do not eat, drink or smoke when using this product. Wash hands before breaks and after work. Contaminated clothing should be laundered before reuse.
Conditions for safe storage, including any incompatibilities	Store in a well-ventilated place. Keep container tightly closed. Keep cool. Keep away from heat, sources of ignition and direct sunlight.
Storage temperature	Ambient. Keep at temperature not exceeding (℃): 27
Storage life	Stable under normal conditions.
Incompatible materials	Keep away from: Flammable liquids, Strong Oxidizing agents, Corrosive Substances, Strong Acids and strong mineral and organic bases, especially primary and secondary aliphatic amines.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits — No OSHA permissible exposure limit (PEL).

SUBSTANCE	CAS No.	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m³)	STEL (ppm)	STEL (mg/m³)	Note
1,3-Benzenediol (Resorcinol)	108-46-3	10	45	20	90	NIOSH
		10	-	20	-	ACGIH, A4

Note: OSHA PELs 1910.1000 TABLE Z-1/ NIOSH RELs / ACGIH TLVs

A4: Not Classifiable as a Human Carcinogen: Agents which cause concern that they could be carcinogenic for humans but which cannot be assessed conclusively because of the lack of data. In vitro or animal studies do not provide indications of carcinogenicity which are sufficient to classify the agent into one of the other categories.

The other components listed in Section 3 do not have occupational exposure limits.

Biological Exposure Indices — Not established

Appropriate engineering controls — Ensure adequate ventilation or use appropriate containment. Atmospheric levels should be controlled in compliance with the occupational exposure limit. A washing facility/water for eye and skin cleaning purposes should be present.

Individual protection measures, such as personal protective equipment (PPE) — General hygiene measures for the handling of chemicals are applicable. Avoid all contact. Do not breathe vapour. Wash hands before breaks and after work. Keep work clothes separately. Contaminated clothing should be laundered before reuse. Do not eat, drink or smoke at the work place.

Eye/face protection

Wear protective eye glasses for protection against liquid splashes. Wear eye protection with side protection (EN166).

Skin protection

Hand protection:
Wear impervious gloves (EN374). Gloves should be changed regularly to avoid permeation problems. Breakthrough time of the glove material: refer to the information provided by the gloves' producer.

Body protection:
Wear impervious protective clothing, including boots, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Respiratory protection

In case of inadequate ventilation wear respiratory protection. Open system(s): Wear suitable respiratory protective equipment.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Clear - Amber Coloured liquid.
Odor	Faint Epoxy Odour
Odor Threshold	Not available.
pH	Not established.
Melting Point/Freezing Point	Not available.

Initial boiling point and boiling range	Not available.
Flash Point	Not available.
Evaporation rate (Butyl acetate = 1)	Not available.
Flammability (solid, gas)	Not applicable - Liquid
Upper/lower flammability or explosive limits	Not available.
Vapour pressure	1 @ 118℃ (mmHg)
Vapour density	>3.8 (Air = 1)
Relative density	1.15 (H2O = 1)
Solubility(ies)	The substance is essentially insoluble in water.
Partition coefficient: n-octanol/water	Not available.
Auto-ignition temperature	Not available.
Decomposition Temperature	Not available.
Viscosity	Not available.

SECTION 10: STABILITY AND REACTIVITY

Reactivity	Stable under normal conditions.
Chemical stability	Stable under normal conditions. May decompose if heated.
Possibility of hazardous reactions	Hazardous polymerisation will not occur.
Conditions to avoid	Keep away from heat, sources of ignition and direct sunlight. Keep at temperature not exceeding (℃): 27
Incompatible materials	Flammable liquids, Strong Oxidizing agents, Corrosive Substances, Strong Acids and strong mineral and organic bases, especially primary and secondary aliphatic amines.
Hazardous decomposition product(s)	Decomposes in a fire giving off toxic fumes: Phenolics, Carbon monoxide and Carbon dioxide.

SECTION 11: TOXICOLOGICAL INFORMATION

Information on toxicological effects (Substances in preparations / mixtures)

Acute toxicity - Ingestion	Based upon the available data, the classification criteria are not met. Acute Toxicity Estimate Mixture Calculation: Estimated LC50 > 2000 mg/kg bw/day.
Resorcinol:	LD50 (oral,rat) mg/kg: 510 (OECD 401)
Acute toxicity - Inhalation	Based upon the available data, the classification criteria are not met. Acute Toxicity Estimate Mixture Calculation: Estimated LC50 > 20.0 mg/l.
Acute toxicity - Skin Contact	Based upon the available data, the classification criteria are not met. Acute Toxicity Estimate Mixture Calculation: Estimated LC50 > 2000 mg/kg bw/day.
Skin corrosion/irritation	Skin Corrosion/Irritation, Category 2; Causes skin irritation.
Bis-[4-(2,3-epoxipropoxi)phenyl] propane:	Skin Corrosion/Irritation, Category 2; Causes skin irritation. (SCL ≥ 5%). Slightly irritating to skin. (rabbit) (OECD 404)
Bisphenol A Diglycidyl Ether:	Skin Corrosion/Irritation, Category 2; Causes skin irritation. No data. EU classification and labelling inventory, ≥ 770 Notifiers
2,3-Epoxypropyl o-tolyl ether:	Skin Corrosion/Irritation, Category 2; Causes skin irritation. Not irritating to skin (rabbit) (OECD 404)
Resorcinol:	Skin Corrosion/Irritation, Category 2; Causes skin irritation. Test Result: Irritating to skin. (in vivo; FHSLA)
Serious eye damage/irritation	Eye Damage, Category 1; Causes serious eye damage.
Bis-[4-(2,3-epoxipropoxi)phenyl] propane:	Eye Irritation, Category 2; Causes serious eye irritation. (SCL ≥ 5%) Not irritating to eyes (rabbit) (OECD 405)
Bisphenol A Diglycidyl Ether:	Eye Irritation, Category 2; Causes serious eye irritation. No data. EU classification and labelling inventory, ≥ 770 Notifiers
Resorcinol:	Eye Damage, Category 1; Causes serious eye damage. Test Result: Causes serious eye damage. (in vivo; FHSLA) (Flickinger, 1976)
Respiratory or skin sensitization	Skin Sensitisation, Category 1: May cause an allergic skin reaction.

Bis-[4-(2,3-epoxipropoxi)phenyl] propane:	Skin Sensitisation, Category 1: May cause an allergic skin reaction. Positive - sensitising. (Mouse) (OECD 429)
Bisphenol A Diglycidyl Ether:	Skin Sensitisation, Category 1: May cause an allergic skin reaction. No data. EU classification and labelling inventory, ≥ 770 Notifiers
2,3-Epoxypropyl o-tolyl ether:	Skin Sensitisation, Category 1: May cause an allergic skin reaction. Test Result: Positive (OECD 406)
Resorcinol:	Skin Sensitisation, Category 1: May cause an allergic skin reaction. Test Result: Positive (OECD 429)
Germ cell mutagenicity	Germ cell mutagenicity, Category 2: Suspected of causing genetic defects.
2,3-Epoxypropyl o-tolyl ether:	Test Result: Positive (OECD 471)
Carcinogenicity	Based upon the available data, the classification criteria are not met.
Reproductive toxicity	Based upon the available data, the classification criteria are not met.
STOT - single exposure	Specific target organ toxicity — single exposure, Category 1; Causes damage to organs. - oral Specific target organ toxicity — single exposure, Category 2; May cause damage to organs - oral.
Resorcinol:	NOAEL 80 mg/kg bw/day (OECD 408)
STOT - repeated exposure	Based upon the available data, the classification criteria are not met.
Aspiration hazard	Based upon the available data, the classification criteria are not met.

Information on likely routes of exposure

Inhalation	Possible – accidental exposure
Ingestion	Unlikely – accidental exposure
Skin Contact	Possible – accidental exposure
Eye Contact	Unlikely – accidental exposure

Early onset symptoms related to exposure	Causes skin irritation. May cause an allergic skin reaction. Causes serious eye damage. Suspected of causing genetic defects. Causes damage to organs (CNS and blood effects - Oral). May cause damage to organs (Respiratory tract - Oral).
Delayed health effects from exposure	Symptoms of poisoning may be delayed for several days.

Other information

NTP Report on Carcinogens	All chemicals are not listed
IARC Monographs	Bis-[4-(2,3-epoxipropoxi)phenyl]propane: Group 3
OSHA Designated Carcinogen	All chemicals are not listed

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity	Aquatic Chronic 3: Harmful to aquatic life with long lasting effects. Estimated Mixture LC50 1 to ≤ 10 mg/l (Fish)
Bis-[4-(2,3-epoxipropoxi)phenyl] propane:	Aquatic Chronic 2; Toxic to aquatic life with long lasting effects. Acute: LC50 (fish) mg/l (96 hour) 1.5 (OECD 203)
Bisphenol A Diglycidyl Ether:	Aquatic Chronic 2; Toxic to aquatic life with long lasting effects. No data. EU classification and labelling inventory, ≥ 770 Notifiers
2,3-Epoxypropyl o-tolyl ether:	Aquatic Chronic 2; Toxic to aquatic life with long lasting effects. Harmonised Classification. LC50 (fish) mg/l 2.8 – 5.1 (OECD 203)
Resorcinol:	Aquatic Acute 1; Very toxic to aquatic life Harmonised Classification Aquatic Chronic 3; Harmful to aquatic life with long lasting effects.. EC50 (Daphnia magna) mg/l 1 (OECD 202)
Persistence and degradability	Part of the components are poorly biodegradable.
Bis-[4-(2,3-epoxipropoxi)phenyl] propane:	Not readily biodegradable Water % Degradation: 5% (28 days) (OECD 301 F)
Bisphenol A Diglycidyl Ether:	No data
2,3-Epoxypropyl o-tolyl ether:	Not readily biodegradable Water % Degradation: ~1 - ~4% (28 days) (OECD 301 B)
Resorcinol:	Readily biodegradable. Water % Degradation: 100% (14 days) (OECD 301 C)

Bioaccumulative potential	The product has low potential for bioaccumulation.
Bis-[4-(2,3-epoxipropoxi)phenyl] propane:	The substance has low potential for bioaccumulation. Bioconcentration factor (BCF) : 31 ((Q)SAR) (Unnamed publication, 2010)
Bisphenol A Diglycidyl Ether:	No data
2,3-Epoxypropyl o-tolyl ether:	No data - Can be waived on basis of: Log Koc : ≤ 3
Resorcinol:	The substance has low potential for bioaccumulation. Bioconcentration factor (BCF) : 3.16 (EPA, 2000)
Mobility in soil	The product is predicted to have low mobility in soil (Insoluble in water).
Bis-[4-(2,3-epoxipropoxi)phenyl] propane:	The substance has moderate mobility in soil. Log Koc: 2.65 ((Q)SAR) (Unnamed publication, 2010)
Bisphenol A Diglycidyl Ether:	No data
2,3-Epoxypropyl o-tolyl ether:	The substance has moderate mobility in soil. Log Koc: 2.32 (OECD 121)
Resorcinol:	The substance has high mobility in soil. Log Koc: 0.98 (Schuurmann, G et al. 2006)
Other adverse effects	None known.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods	This material and its container must be disposed of as hazardous waste. Send after pre-treatment to a appropriate hazardous waste incinerator facility according to legislation.
Additional Information	Dispose of contents in accordance with local, state or national legislation.

SECTION 14: TRANSPORT INFORMATION

	ADR/RID	**IMDG**	**IATA**
UN number	UN 3082	UN 3082	UN 3082
UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Bis-[4-(2,3-epoxipropoxi)phenyl] propane; Bisphenol A Diglycidyl Ether; 2,3-Epoxypropyl o-tolyl ether)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Bis-[4-(2,3-epoxipropoxi)phenyl] propane; Bisphenol A Diglycidyl Ether; 2,3-Epoxypropyl o-tolyl ether)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Bis-[4-(2,3-epoxipropoxi)phenyl] propane; Bisphenol A Diglycidyl Ether; 2,3-Epoxypropyl o-tolyl ether)
Transport hazard class(es)	9	9	9
Packing group	III	III	III
Environmental hazards	Environmentally hazardous substance.	Classified as a Marine Pollutant.	Environmentally hazardous substance
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	See Section: 2		
Special precautions for user	Not applicable		

SECTION 15: REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture
US Federal Regulations

TSCA (Toxic Substance Control Act)	Bis-[4-(2,3-epoxipropoxi)phenyl]propane: Subject to 25,000 lb reporting threshold Bisphenol A Diglycidyl Ether (MW <700): Exempt from reporting under CDR 2,3-Epoxypropyl o-tolyl ether: Subject to 25,000 lb reporting threshold
EPCRA/SARA Section 302 Extremely Hazardous Substances	All chemicals are not listed
EPCRA Section 313 Toxics Release Inventory (TRI) Program	All chemicals are not listed
NIOSH Occupational Carcinogen List	All chemicals are not listed

OSHA List of highly hazardous chemicals, toxics and reactives	All chemicals are not listed
NTP Report on Carcinogens (RoC) List	All chemicals are not listed
Poison Prevention Packaging Act	All chemicals are not listed
US State Regulations	
California State, Proposition 65 List	All chemicals are not listed
California State, Safer Consumer Products Regulations	All chemicals are not listed
Maine State, Toxic Chemicals in Children's Products Act	All chemicals are not listed
New Jersey State Worker and Community RTK Act	All chemicals are not listed
Pennsylvania State, Worker and Community RTK Act	All chemicals are not listed
Rhode Island State, Hazardous Substances RTK Act	All chemicals are not listed
Non-Regional	
IARC Monographs, List of Classifications	Bis-[4-(2,3-epoxipropoxi)phenyl]propane: Group 3

SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements: Updated substance / mixture classification. Updated version and date. Please review SDS with care. See below -

Sections indicated with the following have been revised:

Version	5.0
Revision Date	06 July 2021
Date of First Issue	20 March 2012

References:
Existing Safety Data Sheet (SDS), EU Data: Harmonised Classification(s) for Bis-[4-(2,3-epoxipropoxi)phenyl]propane (CAS No. 1675-54-3), 2,3-Epoxypropyl o-tolyl ether (CAS No. 2210-79-9) and Resorcinol (CAS No. 108-46-3). Existing ECHA registration(s) for 2,3-Epoxypropyl o-tolyl ether (CAS No. 2210-79-9) and Resorcinol (CAS No. 108-46-3), and the Classification and Labelling Inventory for Bisphenol A Diglycidyl Ether (CAS No. 25085-99-8).

GHS Classification of the substance or mixture	Classification Procedure
Skin Corrosion/Irritation, Category 2	Threshold Calculation
Skin Sensitisation, Category 1	Threshold Calculation
Eye Damage, Category 1	Threshold Calculation
Germ cell mutagenicity, Category 2	Threshold Calculation
Specific target organ toxicity — single exposure, Category 1	Threshold Calculation
Specific target organ toxicity — single exposure, Category 2	Threshold Calculation
Hazardous to the aquatic environment, Chronic, Category 2	Summation Calculation

LEGEND

ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
CAS	Chemical Abstracts Service
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CWA	Clean Water Act
EC	European Community
ECHA	European Chemicals Agency
EU	European Union
IATA	International Air Transport Association
IARC	International Agency for Research on Cancer
ICAO	International Civil Aviation Organization
IMDG	International Maritime Dangerous Goods
LC50	Lethal concentration at which 50% of the population is killed
LD50	Lethal dose at which 50% of the population is killed
LTEL	Long term exposure limit
NOEC	No Observed Effect Concentration

NTP	National Toxicology Program
OECD	Organisation for Economic Cooperation and Development
OSHA	The Occupational Safety & Health Administration
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail
STEL	Short term exposure limit
TSCA	Toxic Substance Control Act
TWA	Time Weighted Average
UN	United Nations

Training advice: Consideration should be given to the work procedures involved and the potential extent of exposure as they may determine whether a higher level of protection is required.

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