

SAFETY DATA SHEET

MAS FLAG EPOXY RESIN

SECTION 1: IDENTIFICATION

GHS PRODUCT IDENTIFIERS:

PRODUCT NAME: MAS Epoxies FLAG Epoxy Resin
SYNONYMS, TRADE NAMES: MAS FLAG Resin, FLAG Resin
OTHER MEANS OF IDENTIFICATION: Not available

RECOMMENDED USE OF THE CHEMICAL AND RESTRICTIONS ON USE:

USES: Polymer Matrix For Fiber-Reinforced Plastic (FRP)
RESTRICTIONS ON USE: None Identified

SUPPLIER'S DETAILS:

MANUFACTURER/SUPPLIER: Endurance Technologies, Inc.
275 Bridge Point Drive
South Saint Paul, MN 55075, USA
TELEPHONE: +1 651 451 8000
FACSIMILE: +1 651 451 9728

CONTACT PERSON: Eric Frank

EMERGENCY PHONE NUMBER:

CHEMTREC (24 HRS): USA 1 800 424 9300
CHEMTREC (24 HRS): INTERNATIONAL +1 703 527 3887

SECTION 2: HAZARDS IDENTIFICATION

GHS CLASSIFICATION OF SUBSTANCE OR MIXTURE:

Skin irritation: Category 2, H315
Eye irritation: Category 2, H319
Skin sensitization: Category 1, H317
Hazardous to the aquatic environment: Chronic Category 2, H411
Hazardous to the aquatic environment: Acute Category 2, H401

GHS LABEL ELEMENTS:

HAZARD SYMBOLS:



SIGNAL WORDS:

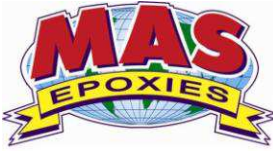
Warning

HAZARD STATEMENTS:

H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H401 Toxic to aquatic life.
H411 Toxic to aquatic life with long lasting effects.

PRECAUTIONARY STATEMENTS:

PREVENTION: P264 Wash hands thoroughly after handling.
P273 Avoid release to the environment.



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RESPONSE: P280 Wear protective gloves, clothing, and eye/face protection.
P301+P312 IF SWALLOWED: Call POISON CENTER and/or doctor if you feel unwell.
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P333+P313 If skin irritation or rash occurs: Get medical attention.
P362+P364 Take off contaminated clothing and wash it before reuse.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313 If eye irritation persists: Get medical attention.
P391 Collect spillage.

STORAGE: P403+P233 Store in a well-ventilated place. Keep container tightly closed.

DISPOSAL: P501 Dispose of contents and containers in accordance with local, regional and international regulations.

Precautionary statements are listed according to the United Nations Globally Harmonized System of Classification and Labeling of Chemicals (GHS) – Annex III

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

CHEMICAL NAME:	CAS NUMBER:	CONTENT:
Bisphenol A Epoxy Resin	25068-38-6	75-95%
Alkyl Glycidyl Ether	120547-52-6	0-10%
Castor Oil Glycidyl Ether	74398-71-3	4-8%
Epoxy Phenol Novolac Resin	28064-14-4	0-10%

Amounts specified are typical and do not represent a specification. Remaining components are proprietary, non-hazardous, and/or present at amounts below reportable limits.

SECTION 4: FIRST-AID MEASURES

DESCRIPTION OF NECESSARY FIRST-AID MEASURES:

INHALATION: If affected, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration.

SKIN: Immediately remove contaminated clothing and shoes. Wash the affected area with plenty of soap and water until no evidence of the chemical remains (at least 15-20 minutes). Launder clothing before reuse. Seek medical attention if symptoms occur.

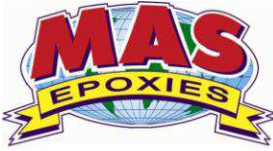
EYES: Immediately flush eyes with plenty of clean water for an extended time, not less than fifteen (15) minutes. Flush longer if there is any indication of residual chemical in the eye. Ensure adequate flushing of the eyes by separating the eyelids with fingers and roll eyes in a circular motion. Seek medical attention if irritation develops or persists.

INGESTION: Do not induce vomiting. Never give anything by mouth to an unconscious person. Rinse out the mouth with water. Get medical attention immediately.

MOST IMPORTANT SYMPTOMS AND EFFECTS, ACUTE AND DELAYED:

SYMPTOMS: Irritation. Pre-existing skin problems may be aggravated by prolonged or repeated contact. See section 11 for additional information.

INDICATION OF IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED, IF NECESSARY:



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TREATMENT: Treat symptomatically.

SECTION 5: FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA:

SUITABLE: Use water spray, foam, dry chemical or carbon dioxide.

UNSUITABLE: None known.

SPECIFIC HAZARDS ARISING FROM THE CHEMICAL:

UNUSUAL FIRE & EXPLOSION HAZARDS: Product is not considered a fire hazard, but will burn if ignited. Closed container may rupture (due to build up in pressure) when exposed to extreme heat.

HAZARDOUS COMBUSTION PRODUCTS: Irritating or toxic substances may be emitted upon burning, combustion or decomposition. See Section 10 Hazardous decomposition products for additional information.

SPECIAL PROTECTIVE EQUIPMENT AND PRECAUTIONS FOR FIRE-FIGHTERS: Wear self-contained breathing apparatus (SCBA) equipped with a full face piece and operated in a pressure-demand mode (or other positive pressure mode) and approved protective clothing. Personnel without suitable respiratory protection must leave the area to prevent significant exposure to hazardous gases from combustion, burning or decomposition. In an enclosed or poorly ventilated area, wear SCBA during cleanup immediately after a fire as well as during the attack phase of firefighting operations. See section 9 for additional information.

SECTION 6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES: See Section 8 for recommendations on the use of personal protective equipment. If spilled in an enclosed area, ventilate. Eliminate ignition sources. Personal Protective Equipment must be worn.

ENVIRONMENTAL PRECAUTIONS: Do not flush product into public sewer, water systems or surface waters.

METHODS AND MATERIALS FOR CONTAINMENT AND CLEANING UP: Stop leak if without risk. Move containers from spill area. Contain by diking with sand, earth or other non-combustible material. Wear proper personal protective clothing and equipment. Absorb spill with an inert material. Place into labeled, closed container; store in safe location to await disposal. Change contaminated clothing and launder before reuse.

SECTION 7. HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING: As with any chemical product, use good laboratory/workplace procedures. Do not cut, puncture, or weld on or near the container. Use under well-ventilated conditions. Wash thoroughly after handling this product. Always wash up before eating, smoking or using the facilities. Avoid eye and skin contact. Avoid inhalation of aerosol, mist, spray, fume, vapor or dust generated by this product. Avoid drinking, tasting, swallowing or ingesting this product. Wash contaminated clothing before reuse. Discard shoes contaminated with this product.

CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES: Keep away from heat, sparks and open flames. Store dry at 15-40°C, under well-ventilated conditions. Store this material away from incompatible substances (see section 10). Do not store in open, unlabeled or mislabeled containers. Keep container closed when not in use. Empty container contains residual product which may exhibit hazards of product. Do not reuse empty container without commercial cleaning or reconditioning.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION



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CONTROL PARAMETERS:

OCCUPATIONAL EXPOSURE LIMITS:

CHEMICAL NAME	CAS NUMBER	ACGIH-TWA	ACGIH-STEL
Bisphenol A Epoxy Resin	25068-38-6	Not available	Not available
Alkyl Glycidyl Ether	120547-52-6	Not available	Not available
Castor Oil Glycidyl Ether	74398-71-3	Not available	Not available
Epoxy Phenol Novolac Resin	28064-14-4	Not available	Not available

APPROPRIATE ENGINEERING CONTROLS: Always provide effective general and, when necessary, local exhaust ventilation to draw spray, aerosol, fume, mist and vapor away from workers to prevent routine inhalation. Ventilation must be adequate to maintain air concentrations below occupational exposure standards. When necessary use mechanical handling to reduce human contact with materials.

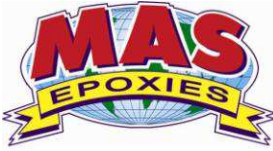
INDIVIDUAL PROTECTION MEASURES, SUCH AS PERSONAL PROTECTIVE EQUIPMENT (PPE):

EYE/FACE PROTECTION:	Safety glasses or goggles required.
SKIN PROTECTION:	Wear chemical resistant (impervious) gloves; PVC, neoprene, nitrile rubber, EVAL, butyl rubber. Wear chemical resistant protective clothing. Use good laboratory/workplace procedures including personal protective clothing: lab coat and protective gloves.
RESPIRATORY PROTECTION:	Wear an approved respirator (e.g., an organic vapor respirator, a full face air purifying respirator for organic vapors, or a self-contained breathing apparatus) whenever exposure to aerosol, mist, spray, fume or vapor exceed the applicable exposure limit(s) of any chemical substance listed in this SDS.
GENERAL PROTECTION:	Eyewash fountains and safety showers are recommended in the work area.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Viscous liquid	UPPER/LOWER FLAMMABILITY OR EXPLOSIVE LIMITS:	Not available
COLOR:	Clear, Yellow	VAPOUR PRESSURE:	<1 mm Hg at 20°C
ODOUR:	Slight	VAPOUR DENSITY:	Heavier than air
ODOUR THRESHOLD:	Not available	RELATIVE DENSITY:	1.13
PH:	Not available	SOLUBILITY(IES):	Negligible
MELTING POINT/ FREEZING POINT	Not available	PARTITION COEFFICIENT (n-octanol/water):	Not available
INITIAL BOILING POINT AND BOILING RANGE:	Not available	AUTO-IGNITION TEMPERATURE:	Not available
FLASH POINT:	350-375°F	DECOMPOSITION TEMPERATURE:	Not available
EVAPORATION RATE:	Not available	VISCOSITY:	2,475 cP at 25°C
FLAMMABILITY (SOLID, GAS):	Not available		

% VOLATILE BY WEIGHT: (ASTM D2369) Refer to hardener SDS for total volatile content of combined resin and hardener.



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SECTION 10. STABILITY AND REACTIVITY

REACTIVITY: Exothermic reactions including polymerization may occur in contact with amines, strong acids, strong bases, alcohols, strong oxidizing agents and excessive heat.

CHEMICAL STABILITY: This product is stable.

POSSIBILITY OF HAZARDOUS REACTIONS: Exothermic reactions including polymerization may occur in contact with amines, strong acids, strong bases, alcohols, strong oxidizing agents and excessive heat.

CONDITIONS TO AVOID: Excessive heat and ignition sources.

INCOMPATIBLE MATERIALS: Avoid strong acids, bases, and oxidizing agents. Avoid contact with amines.

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition may produce smoke, carbon monoxide, carbon dioxide, aldehydes and other products of incomplete combustion. Phenolics.

SECTION 11. TOXICOLOGICAL INFORMATION

INFORMATION ON THE LIKELY ROUTES OF EXPOSURE: Eyes, skin, inhalation and ingestion.

SYMPTOMS RELATED TO THE PHYSICAL, CHEMICAL AND TOXICOLOGICAL CHARACTERISTICS:

EYES: Causes serious eye irritation.

SKIN: Causes skin irritation. May cause allergic skin reaction. Repeated or prolonged contact may cause skin irritation and dermatitis.

INHALATION: High airborne concentrations of vapors resulting from heating, misting or spraying may cause irritation of the respiratory track and mucous membranes.

INGESTION: Ingestion may cause irritation.

DELAYED AND IMMEDIATE EFFECTS AND ALSO CHRONIC EFFECTS FROM SHORT AND LONG TERM EXPOSURE: Further information is not available.

ACUTE TOXICITY:

CHEMICAL NAME	LC ₅₀ INHALATION	LD ₅₀ ORAL (RAT)	LD ₅₀ DERMAL (RABBIT)
Bisphenol A Epoxy Resin	Not available	>2,000 mg/kg	>2,000 mg/kg
Alkyl Glycidyl Ether	Not available	17,000 mg/kg	>4.5 mL/kg
Castor Oil Glycidyl Ether	Not available	>5,000 mg/kg	>2,000 mg/kg
Epoxy Phenol Novolac Resin	Not available	>2,000 mg/kg	>2,000 mg/kg

CORROSION / IRRITATION / SENSITIZATION INFORMATION:

SKIN CORROSION/IRRITATION: Skin Irritation – Category 2

SERIOUS EYE DAMAGE/IRRITATION: Eye Irritation – Category 2

RESPIRATORY OR SKIN SENSITIZATION: Skin Sensitization – Category 1

CARCINOGENICITY / MUTAGENICITY / REPRODUCTIVE TOXICOLOGY INFORMATION:

GERM CELL MUTAGENICITY: Information is not available.

CARCINOGENICITY: Information is not available.

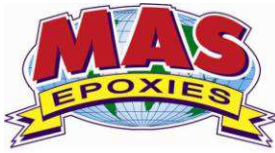
REPRODUCTIVE TOXICITY: Information is not available.

SPECIFIC TARGET ORGAN TOXICITY (STOT):

STOT-SINGLE EXPOSURE: Information is not available.

STOT-REPEATED EXPOSURE: Information is not available.

ASPIRATION HAZARD: Information is not available.



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OTHER INFORMATION: Additional information is not available.

SECTION 12. ECOLOGICAL INFORMATION

TOXICITY:

CHEMICAL NAME	TEST	SPECIES	RESULT
Bisphenol A Epoxy Resin	LC ₅₀ (96 hrs)	Fish	2.4 mg/L
	EC ₅₀ (24 hrs)	Daphnia	3.6 mg/L
	IC ₅₀ (96 hrs)	Bacteria	>100 mg/L
Alkyl Glycidyl Ether	Not available		
Castor Oil Glycidyl Ether	LC ₅₀ (96 hrs)	Fish	>100 mg/L
Epoxy Phenol Novolac Resin	LC ₅₀ (96 hrs)	Fish	>1-10 mg/L
	EC ₅₀ (48 hrs)	Daphnia	>1-10 mg/L

PERSISTENCE AND DEGRADABILITY:

CHEMICAL NAME	TEST	PERIOD	RESULT
Bisphenol A Epoxy Resin	OECD Derived from OECD 301F (Biodegradation Test)	28 Days	5%
Alkyl Glycidyl Ether	Not readily biodegradable		
Castor Oil Glycidyl Ether	Not expected to be readily biodegradable		
Epoxy Phenol Novolac Resin	Not readily biodegradable		

BIOACCUMULATIVE POTENTIAL:

CHEMICAL NAME	Log P _{ow}	BCF	POTENTIAL
Bisphenol A Epoxy Resin	3.242	31	Low
Alkyl Glycidyl Ether	3.77 (Log K _{ow})	Not available	Not available
Castor Oil Glycidyl Ether	Not available	Not available	Not available
Epoxy Phenol Novolac Resin	Not available	Not available	Not available

MOBILITY IN SOIL:

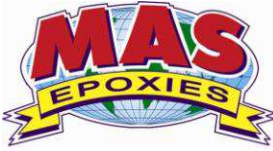
CHEMICAL NAME	TEST	RESULT
Bisphenol A Epoxy Resin	Soil/water partition coefficient (K _{oc})	445
Alkyl Glycidyl Ether	Not available	
Castor Oil Glycidyl Ether	Not available	
Epoxy Phenol Novolac Resin	Not available	

OTHER ADVERSE EFFECTS: Additional information is not available

SECTION 13. DISPOSAL CONSIDERATIONS

DISPOSAL METHODS: Dispose of unused contents (incineration) in accordance with national and local regulations. Dispose of container in accordance with national and local regulations. Ensure the use of properly authorized waste management companies, where appropriate. See section 8 for recommendations on the use of personal protective equipment.

SECTION 14. TRANSPORTATION INFORMATION



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UN NUMBER: UN3082

UN PROPER SHIPPING NAME: Environmentally Hazardous Substance, Liquid, N.O.S., (Epoxy Resin)

TRANSPORT HAZARD CLASS:

U.S. DOT HAZARD CLASS:	Not Regulated
CANADA TDG HAZARD CLASS:	Not Regulated
EUROPE ADR/RID HAZARD CLASS:	9
IMDG CODE (OCEAN) HAZARD CLASS:	9
ICAO/IATA (AIR) HAZARD CLASS:	9

PACKING GROUP: III

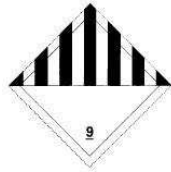
ENVIRONMENTAL HAZARDS:

MARINE POLLUTANT:	Yes
HAZARDOUS SUBSTANCE (USA):	No

SPECIAL PRECAUTIONS FOR USER: Information is not available.

TRANSPORTING IN BULK ACCORDING TO ANNEX II OF MARPOL 73/78 AND THE IBC CODE:
Information is not available.

LABEL FOR CONVEYANCE:



OTHER INFORMATION: For surface shipments within the United States: Not regulated. ORM-D Consumer Commodity in 1 gal or less containers

SECTION 15. REGULATORY INFORMATION

SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS SPECIFIC FOR THE PRODUCT IN QUESTION:

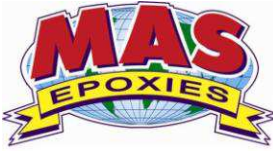
EU Regulation (EC) No. 1907/2006 (REACH) Annex XIV – List of substances subject to authorization, Substances of very high concern	None of the components are listed.
Annex XVII – Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles	None of the components are listed.

OTHER REGULATIONS: Additional information is not available.

CHEMICAL INVENTORIES:

Canadian Domestic Substances List (DSL):	Y
Canadian Non-Domestic Substances List (NDSL):	N
European Inventory of Existing Chemical Substances (EINECS):	Y
European List of Notified Chemical Substances (ENCS):	N
U.S. Toxic Substances Control Act (TSCA):	Y

A "Y" listing indicates all intentionally added components are either listed or are otherwise compliant with the regulation. A "N" listing indicates that for one or more components: 1) there is no listing on the public inventory; 2) no information is available; or 3) the component has not been reviewed.



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SECTION 16. OTHER INFORMATION

REVISION DATE: August 30, 2013

LEGEND:

- ACGIH: American Conference of Governmental Industrial Hygienists
- ADR/RID: European dangerous goods transport road and rail regulations
- CAS No: Chemical Abstract Service Registry Number
- DOT: Department of Transportation (U.S.)
- GHS: Globally Harmonized System of Classification and Labeling of Chemicals
- IATA: International Air Transport Association
- ICAO: International Civil Aviation Organization
- IMDG: International Maritime Dangerous Goods code
- OEL: Occupational Exposure Limits
- OSHA: Occupational Safety and Health Administration (U.S.)
- PEL: Permissible Exposure Limit
- RQ: Reportable Quantity
- SDS: Safety Data Sheet
- STEL: Short Term Exposure Limit (15 minute Time Weighted Average)
- TDG: Canadian Transportation of Dangerous Goods Act and Regulations
- UN: United Nations
- U.S.: United States

USERS RESPONSIBILITY/DISCLAIMER OF LIABILITY:

As the conditions or methods of use are beyond our control, we do not assume any responsibility and expressly disclaim any liability for any use of this product. Information contained herein is believed to be true and accurate but all statements or suggestions are made without warranty, expressed or implied, regarding accuracy of the information, the hazards connected with the use of the material or the results to be obtained from the use thereof. Compliance with all applicable federal, state, and local laws and local regulations remains the responsibility of the user.