MONO ETHYLENE GLYCOL

Reliance Industries Limited
Growth is Life

Section-1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

1.1 Identification of the substance/preparation:

Commercial name: MONO ETHYLENE GLYCOL (MEG)
Chemical name: MONO ETHYLENE GLYCOL (MEG) C2-H6-O2
Synonyms: 1,2 di hydroxyl ethane, Ethane 1,2-Diol, Ethylene alcohol, Ethylene dehydrate.

1.2 Use of the substance /preparation:

Used in polyester fibers and films, solvent mixture for cellulose esters and ethers, Unsaturated Polyester Resins. Ethylene glycol is used as antifreeze in cooling and heating systems, in hydraulic brake fluids, as an industrial humectant, as an ingredient of electrolytic condensers, as a solvent in the paint and plastics industries, in the formulations of printers' inks, stamp pad inks, and inks for ballpoint pens, as a softening agent for cellophane, and in the synthesis of safety explosives, plasticizers, synthetic fibers (Terylene, Dacron), and synthetic waxes.

1.3 MANUFACTURER & SUPPLIER: Reliance Industries Limited Emergency Coordination Centre contact details:

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SSM: Site Shift Manager

Section 2 – HAZARD IDENTIFICATION

2.1 Classification of the substance/preparation: Hazard class and category code.

GHS Category:

Health	Environmental	Physical
Acute Toxicity Category: Inhalation 4 Specific Target Organ Toxicity: Category 2	Aquatic Toxicity – Category- NA	Flammable – Category NA

NA: Not available

https://pubchem.ncbi.nlm.nih.gov/compound/174#section=Hazard-Classes-and-Categories

GHS Label: GHS07: Harmful, GHS08 : Health Hazard

Signal word: Warning.

Details of statements:

Hazard Statements	H 302: Harmful if swallowed. H373: Causes damage to organs through prolonged or repeated exposure.
Precautionary Statement Prevention	P260: Do not breathe dust/fume/gas/mist/vapors/spray P264: Wash hands thoroughly after handling. P270: Do not eat, drink or smoke when using this product.
Precautionary Statement Response	P301+P317: IF SWALLOWED : Get medical help P-319 : Get medical help if you feel unwell. P-330: Rinse mouth
Precautionary Statement Storage	No storage statements
Precautionary Statement Disposal	Follow local regulation P-501: Disposal of contents / container.

Hazard ratings:

NFPA HAZARD CODES	RATINGS SYSTEM
HEALTH: 2	0 = No Hazard
FLAMMABILITY: 1	1 = Slight Hazard
INSTABILITY: 0	2 = Moderate Hazard
	3 = Serious Hazard
	4 = Severe Hazard

Data Reference:
https://pubchem.ncbi.nlm.nih.gov/compound/174#section=NFPA-Hazard-Classification

2.2 Information pertaining to particular dangers for human:
Irritating if inhaled. Irritating to eyes, skin and respiratory organs.

2.3 Information pertaining to particular dangers for the environment: NA

2.4 Other adverse effects: NA.

Route of entry:
Those with history of lung diseases, or skin problems may be more susceptible to the effects of this substance.

Skin Contact	Skin Absorption	Eye Contact	Inhalation	Ingestion
Yes	Yes	Yes	Yes	Yes

Data reference:
https://pubchem.ncbi.nlm.nih.gov/compound/174#section=Exposure-Routes

Health hazards:

Source	NTP listed?	IARC cancer review group?	OSHA Regulated?
Carcinogenicity	No	No	No

DATA REFERENCE:
https://pubchem.ncbi.nlm.nih.gov/compound/174#section=Evidence-for-Carcinogenicity

Section 3 – COMPOSITION & INFORMATION ON INGREDIENTS

Ingredients / Hazardous	CAS No.	EC No.	Percentage
Mono Ethylene Glycol/Yes	107-21-1	203-473-3	99.8% (wt.) min.
Diethylene Glycol / Yes	111-46-6	203-872-2	0.08 % (wt.) max
Moisture / Yes	7732-18-5	231-791-2	0.05 % (wt.) max.

Section 4 – FIRST AID MEASURES

4.1 General advice
IMMEDIATE MEDICAL ATTENTION IS REQUIRED AFTER INHALATION OR AFTER SWALLOWING.
In case of health troubles or doubts, seek medical advice immediately and show this (Material) Safety Data Sheet.

4.2 Inhalation
Fresh air, rest. Refer for medical attention.

4.3 Skin contact
Remove contaminated clothes. Rinse skin with plenty of water or shower.

4.4 Eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

4.5 Swallowing
Rinse mouth. Do NOT induce vomiting. Refer immediately for medical attention.

Section 5 – FIRE FIGHTING MEASURES

5.1 Suitable extinguishing media
Use water spray, Dry chemical Powder, alcohol resistant foam and carbon dioxide.

5.2 Extinguishing media to be avoided: Water in the form of Jet.

5.3 Caution about specific danger in case of fire and fire-fighting procedures
Keep product and empty container away from heat and sources of ignition. Vapours may travel considerable far distances and cause subsequent ignition. Vapours is heavier than air, may cumulate along the ground and in enclosed spaces – danger of explosion. Do not empty into drains. When burning, it emits carbon monoxide, carbon dioxide and irritant fumes.
Containers with the substance exposed to excessive heat may explode. Move containers from fire area if safe to do so. Water spray may be useful in cooling equipment exposed to heat and flame.

5.4 Special protective equipment for fire-fighters
Wear full protective fire-resistant clothing and self-contained breathing apparatus.

Section 6 –ACCIDENTAL RELEASE MEASURES

6.1 Person-related safety precautions
Isolate hazard area. Evacuate all unauthorized personnel not participating in rescue operations from the area. Avoid entry into danger area. Remove all possible sources of ignition. Stop traffic and switch off the motors of the engines. Do not smoke and do not handle with naked flame. Use explosion-proof lamps and non-sparking tools. Avoid contact with the substance. Apply recommended full protective personal equipment. When escaping from the contaminated area, wear mask with cartridge against organic vapours. In case of general average, evacuate personnel from danger area. Filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Collect leaking and spilled liquid in sealable containers as far as possible. Wash away remainder with plenty of water.

6.2 Precautions for protection of the environment
Prevent from further leaks of substance. The primary hazard is the threat to the environment. Immediate steps should be taken to limit its spread to the environment. Since it is a liquid it can easily penetrate the soil and contaminate groundwater and nearby streams. Environmental considerations: Land spill: Dig a pit, pond, lagoon, holding area to contain liquid or solid material.

6.3 Recommended methods for cleaning and disposal
Soak up residues with compatible porous material and forward for disposal in closed containers. Dispose off under valid legal waste regulations. The most favorable course of action is to use an alternative chemical product with less inherent propensity for occupational exposure or environmental contamination. Recycle any unused portion of the material for its approved use or return it to the manufacturer or supplier. Ultimate disposal of the chemical must consider: the material's impact on air quality; potential migration in soil or water; effects on animal, aquatic, and plant life; and

conformance with environmental and public health regulations.

Section 7 –HANDLING AND STORAGE

7.1 Information for safe handling
Observe all fire-fighting measures (no smoking, do not handle with naked flame and remove all possible sources of ignition). Take precautionary measures against static discharges. Wear recommended personal protective equipment and observe instructions to prevent possible contact of substance with skin and eyes and inhalation. Avoid leak to environment.

7.2 Information for storage
Storerooms should meet the requirements for the fire safety of constructions and electrical facilities and should be in conformity with valid regulations. Store in cool, well-ventilated place with effective exhaust, away from heat and all sources of ignition. Store in tightly closed container. Do not store together with oxidizing agents. Safe storage should be done and MEG should be stored separated from strong oxidants, strong acids, strong bases. Storage area should be dry and ventilation should be there along the floor. MEG should be stored in tightly closed containers in a cool and well ventilated area away from oxidizing agents.

Conditions for safe storage are as follows:-
1) Storage temperature < 40 degree C.
2) Storage duration = 12 months

Following MOCs are typically used for storage containers or drums:-

1) Stainless steel
2) High density polyethylene (HDPE): often used for smaller MEG storage containers or drums
3) Carbon steel with epoxy coatings

7.3 Information for specific use: Not applicable.

Section 8 –EXPOSURE CONTROL & PERSONAL PROTECTION

8.1 Occupational Exposure Limits:

Material	Source	Type	ppm	mg/m3	Notation
MONO ETHYLENE GLYCOL	ACGIH	TWA	25	NA	
	ACGIH	STEL	50	NA	

NA: Data not available,
Data reference: https://www.osha.gov/chemicaldata/chemResult.html?recNo=63
Provide adequate ventilation when using the material and follow the principles of good occupational hygiene to control personal exposure.

8.2 Occupational exposure controls
Collective protection measures: General and local ventilation, effective exhaust.
Individual protection measures: Personal protective equipment (PPE) for the protection of eyes, hands and skin corresponding with the performed labour

has to be kept at disposition for the employees. In cases, where the workplace exposure control limits cannot be observed with the help of technical equipment or where it is not possible to ensure that the respiratory system exposure does not represent a health hazard for the personnel, adequate respiratory protection have to be kept at disposition. In the case of continuous use of this equipment during constant work, safety breaks have to be scheduled, if the PPE-character requires this. All PPE have to be kept in disposable state and the damaged or contaminated equipment has to be replaced immediately.

RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT (PPE):

HANDS	EYES	BODY	RESPIRATORY
			

Respiratory protection: If the exposure limit is exceeded and engineering controls are not feasible, wear a supplied air, full-face piece respirator, airline hood, or full face piece self-contained breathing apparatus. protective mask with canister A (brown coloured, protecting against organic vapours), self-contained breathing apparatus.

Eye protection: Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Hand protection: Wear gloves of impervious material.

Body protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Protective coverall antistatic design recommended, impervious when handling big amounts (nitrile rubber), sealed leather footwear (free from synthetic adhesives)

Hygiene Measures: Wash hands, forearms and face thoroughly after handling. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

8.3 Environmental exposure controls

Proceed in accordance with valid air, water and other relevant legislative regulations.

Engineering measures: Use only with adequate ventilation. If user operations generate dust, fumes, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended limits. The engineering controls also need to keep vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Section 9 –PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Colourless Syrupy liquid
Odour	Odorless
Solubility in water	Miscible
Relative Density (H2O=1) @ 20°C	1.1
Boiling Point °C@760 mmHg	197 - 198 °C
Melting Point °C	-13 °C
Relative Vapour Density (Air=1)	2.1
Flash point °C	111 °C (Closed cup)

Auto ignition °C	398°C
Vapour pressure (Pa) @ 20 °C	6.5
Explosive limits in air % by volume	Not explosive
Flammability limits in air % by volume	3.2
pH	NA
Viscosity mPa @20 °C	21
Pour point	NA
Evaporation rate (water=1)	NA
Octanol/water partition coefficient log Kow	-1.36
% volatile	NA

NA: NOT AVAILABLE
https://pubchem.ncbi.nlm.nih.gov/compound/174#section=Experimental-Properties

Section 10 –CHEMICAL STABILITY AND REACTIVITY INFORMATION

10.1 Conditions to avoid
Prolonged exposure of containers or tank cars to heat or fire may cause the material to expand with possible container rupture
10.2 Material to avoid
AIR AND WATER REACTIONS:
No rapid reaction with air.
Mixing ETHYLENE GLYCOL in equal molar portions with any of the following substances in a closed container caused the temperature and pressure to increase: chlorosulfonic acid, oleum, sulfuric acid, [NFPA 1991].
REACTIVE GROUPS: Alcohols and Polyols

Corrosion to metals	: No corrosive effect on metal.
Flammable gases	: no
Toxic gases	: no
Corrosive gases	: no
Smoke or fog	: no
Peroxides	: no
Formation of flammable gases	: Forms no flammable gases in the presence of water

10.3 Hazardous decomposition products
Possible decomposition products:
carbonyl compounds, Dioxolan derivatives, carbon monoxide and carbon dioxide.
Polymerization: Polymerization occurs if heated in sunlight or presence of air; reaction is exothermic.

Section 11 –TOXICOLOGICAL INFORMATION

11.1 Acute effects
Acute toxicity data:

Parameter	Route	Species	Values	Exposure period
LD50	Oral	mouse	5500 mg/kg	Not applicable

Data reference: https://pubchem.ncbi.nlm.nih.gov/compound/174#section=Acute-Effects
11.2 Repeated dose toxicity: Chronic or repeated exposure to ethylene glycol may

lead to: irritation of the throat, mild headache, low backache, loss of consciousness, and nystagmus.

11.3 Sensitisation: The substance is irritating to the eyes and respiratory tract

11.4 CMR effects (carcinogenicity, mutagenicity, toxicity for reproduction)

Not a CMR

11.5 Toxicokinetics, metabolism, distribution: Not applicable.

Section 12 –ECOLOGICAL INFORMATION

12.1 Ecotoxicity data:

Parameter	Route	Species	Values	Exposure period
LC50	Inhalation	Leuciscus idus melanotus Fish fresh water	> 10000 mg/L	48 Hours
LC50	Inhalation	Carassius auratus (Goldfish)	>5000000 ug/L	24Hours

Data reference: https://pubchem.ncbi.nlm.nih.gov

12.2 Mobility: Expected to have high mobility in soil

12.3 Persistence and degradability: Substance is biodegradable

12.4 Bio accumulative potential: Low.

12.5 Results of PBT assessment Persistence and Degradation: NA

12.6 Other adverse effects: NA

Environmental Fate: Mono Ethylene Glycol is expected to have high mobility in soil, Volatilization from water surfaces is not expected.

Data reference: https://toxnet.nlm.nih.gov/cgi-bin/sis/search2/f?./temp/~wu50Rd:1

NA:Not Available

Section 13– DISPOSAL CONSIDERATION

Local Legislation: Disposal should be in accordance with applicable regional, national, and local laws and regulations. This product should not be dumped, spilled, rinsed or washed into sewers or public waterways.

13.1 Recommended disposal methods for the substance / preparation

Product reuse or disposal in accordance with valid waste legislative regulations.

13.2 Recommended disposal methods for contaminated packaging

Product is transported in tank-vehicles.

13.3 Waste management measures that control exposure of humans and environment

Proceed in accordance with valid air, water and other relevant legislative regulations.

13.4 Waste regulation

Follow local regulation.

Section 14– TRANSPORT INFORMATION

International Transport Regulation:

ADR/RID (Road/Rail), IMDG (Sea) and ICAO/IATA (Air)

The product is not regulated

14.1
Proper Shipping Name: Not classified
Hazard Class: Not classified
UN Number: Not classified
Emergency Action Code: Not classified

14.2 Special transport precautionary measures
Not applicable.

Section 15– REGULATORY INFORMATION

(M)SDS format on a 16 Section based on guidance provided in:

Indian Regulation:
Manufacture, Storage and Import of Hazardous Chemicals Rule, 1989.
The Factories Act 1948

International Regulations:
European SDS Directive
ANSI MSDS Standard
ISO 11014-1 1994
WHMIS Requirements
United States
Hazard Communication Standard
Canada
Hazardous Products Act and Controlled Products Regulations
Europe
Dangerous Substance and Preparations Directives
Australia
National Model Regulations for the Control of Workplace Hazardous Substances

The Globally Harmonized System of Classification and Labeling of Chemicals endorsed by The UN Economic and Social Council

* Risk phrases: R22 Harmful if swallowed.

*Safety phrases: S2 Keep out of reach of children, S46 If swallowed, seek medical advice immediately and show the container or label.

*These standard risk and safety phrases for use when interpreting (Material) Safety data Sheets are derived from the European Union Regulation, CHIP Regulations - Chemicals (Hazard Information and Packaging for Supply). They are required to be used in (Materials) Safety Data Sheets to identify potential hazards and offer safe handling advice.

Section 16 – OTHER INFORMATION

Training instructions
Personnel handling the product has to be acquainted demonstrably with its hazardous properties, with health and environmental protection principles related

to the product and first aid principles.
Tremcard details/Reference: Refer Section 14
Local bodies involved (Applicable only with in India): Local District Authorities and Local Crisis Group

Sources of data used to compile the (Material) Safety Data Sheet
Data compilation reference: National Institute for Occupational Safety and Health guide to chemical hazards and International Chemical Safety Cards (WHO/IPCS/ILO) and
http://webnet3.oecd.org/eChemPortal/Results2.aspx?SubstanceId=169630, .
http://ecb.jrc.ec.europa.eu/esis/index.php?PGM=ein,
http://www.cdc.gov/niosh/npg/npgd0049.html

(M)SDS Revision Status:

Date of Revision	Revised Sections	Supercedes
Sep. 01, 2009	Format revised	Feb. 01, 2008
Sep. 01, 2011	Section 4 (4.3)	Sep. 01, 2009
Aug. 01, 2013	Section 2 NFPA Hazard statement	Sep. 01, 2011
April 01 2016	Section 12	Aug. 01, 2013
Jan.01,2019	Section 1 Jamnagar Manufacturing Division	April 01 2016
Feb. 24, 2023	Section 1,2,4,5,7,8,10, 11,12,13	Jan. 01, 2019

This (M)SDS is issued by Hazira, Vadodara, Nagothane, Dahej and Jamnagar Manufacturing Divisions of Reliance Industries Limited.

Contact Details: For any enquiry/comment regarding this (Material) Safety Data Sheet, kindly contact the respective Site SSM Office (Contact details mentioned on Page No 1)

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End of (M)SDS