1. Chemical Product and Company Identification

Product Name: MONOETHYLENE GLYCOL
Other name(s): Ethylene glycol; MEG; 1,2-Ethanediol; 1,2-Dihydroxyethane.
Recommended Use of the Chemical and Restrictions on Use
Coolant and antifreeze; heat transfer agent; brake fluids; solvent; humectant.
Supplier`s Name Revlogi Materials
No. 25, Jalan TPP 1/13, Taman Perindustrian Puchong,
Batu 12, Jalan Puchong
47100 Puchong, Selangor Darul Ehsan
Telephone No. 016-2013753
Fax 03-80687791

2. Hazards Identification

Not classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for transport by Road and Rail; NON-DANGEROUS GOODS.

This material is hazardous according to Safe Work Australia; HAZARDOUS CHEMICAL.

Classification of the chemical:
Acute Oral Toxicity - Category 4
Specific target organ toxicity (repeated exposure) - Category 2

SIGNAL WORD: WARNING

Hazard Statement(s):
H302 Harmful if swallowed.
H373 May cause damage to organs through prolonged or repeated exposure.

Precautionary Statement(s):
Prevention:
P260 Do not breathe mist, vapours, spray.
P264 Wash hands thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.

Response:
P301+P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P330 Rinse mouth.
P314 Get medical advice/attention if you feel unwell

Storage:
No storage statements.

Disposal:
P501 Dispose of contents and container in accordance with local, regional, national, international regulations.

Poisons Schedule (SUSMP): S6 Poison

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3. Composition/Information on Ingredients

Components	CAS Number	Proportion	Hazard Codes
Ethylene glycol	107-21-1	100%	H302 H373

4. Description of First Aid Measures

For advice, contact a Poisons Information Centre (e.g. phone Australia 131 126; New Zealand 0800 764 766) or a doctor.

Inhalation: Remove victim from area of exposure - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. If patient finds breathing difficult and develops a bluish discolouration of the skin (which suggests a lack of oxygen in the blood - cyanosis), ensure airways are clear of any obstruction and have a qualified person give oxygen through a face mask. Apply artificial respiration if patient is not breathing. Seek immediate medical advice.

Skin Contact: If skin contact occurs, remove contaminated clothing and wash skin with running water. If irritation occurs seek medical advice.

Eye Contact: If in eyes, wash out immediately with water. In all cases of eye contamination it is a sensible precaution to seek medical advice.

Ingestion: Rinse mouth with water. If swallowed, give a glass of water to drink. If vomiting occurs give further water. Seek immediate medical assistance.

Indication of immediate medical attention and special treatment needed: Treat symptomatically. Following ingestion admission to hospital should be the first priority. Gastric lavage or emesis should be performed as soon as possible to minimise absorption and is recommended within four hours of ingestion. Gastric lavage or emesis should not be attempted unless medical expertise or adequate facilities are available. Ethanol may be given intravenously as an antidote to prevent build-up of toxic metabolites and increase excretion of unchanged ethylene glycol by the kidneys. Uraemia, pulmonary oedema and metabolic acidosis can occur and dialysis, preferably haemodialysis, may be employed to treat these complications and to remove ethylene glycol and its metabolites from the blood. Ethylene glycol can cause central nervous system depression and metabolic acidosis. Consider removal by gastric lavage. Blockade of the diacid/hydroxyacid metabolites may follow competitive inhibition of alcohol dehydrogenase with ethanol or 4-methyl pyrazole. Consider maintenance of a plasma ethanol level of 100 mg/dL to 150 mg/dL.

5. Fire Fighting Measures

Suitable Extinguishing Media:
Fine water spray, normal foam, dry agent (carbon dioxide, dry chemical powder).

Unsuitable Extinguishing Media:
Water jet.

Specific hazards arising from the chemical:
Combustible liquid.

Special protective equipment and precautions for fire-fighters:
On burning will emit toxic fumes, including those of oxides of carbon . Fire fighters to wear self-contained breathing apparatus and suitable protective clothing if risk of exposure to vapour or products of combustion. Heating can cause expansion or decomposition of the material, which can

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lead to the containers exploding. If safe to do so, remove containers from the path of fire. Keep containers cool with water spray.

6. Accidental Release Measures

Emergency procedures/Environmental precautions:
Clear area of all unprotected personnel. Shut off all possible sources of ignition. If contamination of sewers or waterways has occurred advise local emergency services.

Personal precautions/Protective equipment/Methods and materials for containment and cleaning up:
Slippery when spilt. Avoid accidents, clean up immediately. Wear protective equipment to prevent skin and eye contact and breathing in vapours. Work up wind or increase ventilation. Contain - prevent run off into drains and waterways. Use absorbent (soil, sand or other inert material). Collect and seal in properly labelled containers or drums for disposal. Wash area down with excess water.

7. Handling and Storage

Classified as a C1 (COMBUSTIBLE LIQUID) for the purpose of storage and handling, in accordance with the requirements of AS 1940. Refer to State Regulations for storage and transport requirements.

This material is a Scheduled Poison S6 and must be stored, maintained and used in accordance with the relevant regulations.

Precautions for safe handling:
Avoid skin and eye contact and breathing in vapour. Keep out of reach of children.

Conditions for safe storage, including any incompatibilities:
Store in a cool, dry, well ventilated place and out of direct sunlight. Store away from foodstuffs. Store away from incompatible materials described in Section 10. Keep containers closed when not in use - check regularly for leaks.

8. Exposure Controls/Personal Protection

Ethylene glycol (vapour): 8hr TWA = 52 mg/m3 (20 ppm), 15 min STEL = 104 mg/m3 (40 ppm), Sk
Ethylene glycol (particulate): 8hr TWA = 10 mg/m3 , Sk

As published by Safe Work Australia Workplace Exposure Standards for Airborne Contaminants.

TWA - The time-weighted average airborne concentration of a particular substance when calculated over an eight-hour working day, for a five-day working week.

STEL (Short Term Exposure Limit) - the airborne concentration of a particular substance calculated as a time-weighted average over 15 minutes, which should not be exceeded at any time during a normal eight hour work day. According to current knowledge this concentration should neither impair the health of, nor cause undue discomfort to, nearly all workers.

`Sk' (skin) Notice - absorption through the skin may be a significant source of exposure. The exposure standard is invalidated if such contact should occur.

These Workplace Exposure Standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable.
These workplace exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.

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Appropriate engineering controls:
Ensure ventilation is adequate and that air concentrations of components are controlled below quoted Workplace Exposure Standards. Vapour heavier than air - prevent concentration in hollows or sumps. DO NOT enter confined spaces where vapour may have collected. Keep containers closed when not in use.

If in the handling and application of this material, safe exposure levels could be exceeded, the use of engineering controls such as local exhaust ventilation must be considered and the results documented. If achieving safe exposure levels does not require engineering controls, then a detailed and documented risk assessment using the relevant Personal Protective Equipment (PPE) (refer to PPE section below) as a basis must be carried out to determine the minimum PPE requirements.

Individual protection measures, such as Personal Protective Equipment (PPE):
The selection of PPE is dependent on a detailed risk assessment. The risk assessment should consider the work situation, the physical form of the chemical, the handling methods, and environmental factors.

OVERALLS, SAFETY SHOES, SAFETY GLASSES, GLOVES, RESPIRATOR.

Wear overalls, safety glasses and impervious gloves. Use with adequate ventilation. If determined by a risk assessment an inhalation risk exists, wear an organic vapour respirator meeting the requirements of AS/NZS 1715 and AS/NZS 1716. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.

9. Physical and Chemical Properties

Physical state: Slightly Viscous Liquid
Colour: Colourless
Odour: Odourless
Molecular Formula: CH2OHCH2OH
Solubility: Miscible in water.
Specific Gravity: 1.12 @20°C
Relative Vapour Density (air=1): 2.2
Vapour Pressure (20 °C): 0.01 kPa
Flash Point (°C): 110 (CC)
Flammability Limits (%): 3.2-12.8 (vapour in air)
Autoignition Temperature (°C): 412
Boiling Point/Range (°C): 197
pH: Not available
Viscosity: 21 cP @20°C
Partition Coefficient: log Pow = -1.36
Freezing Point/Range (°C): -13

10. Stability and Reactivity

Reactivity: Reacts with strong oxidising agents.
Chemical stability: Stable under normal conditions of use.
Possibility of hazardous reactions: None known.
Conditions to avoid: Excessive heat will lead to accelerated oxidative degradation.
Incompatible materials: Incompatible with strong oxidising agents.
Hazardous decomposition products: Oxides of carbon.

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11. Toxicological Information

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:

Ingestion:
Initial symptoms following a large dose (>100ml) are those of alcohol intoxication progressing to vomiting, headache, stupor, convulsions and unconsciousness. Respiratory system involvement may occur 12 - 24 hours after ingestion. Symptoms may include hyperventilation and rapid shallow breathing. Death may occur from respiratory failure or pulmonary oedema.

Eye contact:
May be an eye irritant.

Skin contact:
Contact with skin may result in irritation. Will have a degreasing action on the skin. Repeated or prolonged skin contact may lead to irritant contact dermatitis. Can be absorbed through the skin. Effects can include those described for 'INGESTION'.

Inhalation:
Breathing in vapour can result in headaches, dizziness, drowsiness, and possible nausea.

Acute toxicity:
Oral LD50 (rat): 4700 mg/kg

Skin corrosion/irritation: Mild irritant (rabbit).
Serious eye damage/irritation: Mild irritant (rabbit).

Chronic effects: Available evidence from animal studies indicate that repeated or prolonged exposure to this material could result in effects on the central nervous system, liver and kidneys .

Estimated minimum lethal dose (human) following ingestion of ethylene glycol is thought to be 1.4ml/kg. High doses of ethylene glycol in rats and mice have resulted in reproductive and developmental toxicity following exposure by the oral and inhalation (respirable aerosol) routes. These particular data sets are not considered relevant to normal industrial use but do emphasise the need for care in handling.
Data from animal and human studies to date do not provide evidence that exposure to ethylene glycol has mutagenic or carcinogenic effects.

12. Ecological Information

Ecotoxicity Avoid contaminating waterways.
Persistence/degradability: Expected to be readily biodegradable.
Bioaccumulative potential: This product shows a low bioaccumulation potential.
96hr LC50 (fish): >10,000 mg/L (marine water); 8050 mg/L (fresh water).

13. Disposal Considerations

Disposal methods:
Refer to Waste Management Authority. Dispose of material through a licensed waste contractor. Normally suitable for incineration by an approved agent.

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14. Transport Information

Road and Rail Transport
Not classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for transport by Road and Rail; NON-DANGEROUS GOODS.

Marine Transport
Not classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea; NON-DANGEROUS GOODS.

Air Transport
Not classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air; NON-DANGEROUS GOODS.

15. Regulatory Information

Classification:
This material is hazardous according to Safe Work Australia; HAZARDOUS CHEMICAL.

Classification of the chemical:
Acute Oral Toxicity - Category 4
Specific target organ toxicity (repeated exposure) - Category 2

Hazard Statement(s):
H302 Harmful if swallowed.
H373 May cause damage to organs through prolonged or repeated exposure.

Poisons Schedule (SUSMP): S6 Poison

This material is listed on the Australian Inventory of Chemical Substances (AICS).

16. Other Information

Supplier Safety Data Sheet; 11/ 2010.
`Registry of Toxic Effects of Chemical Substances'. Ed. D. Sweet, US Dept. of Health & Human Services: Cincinatti, 2014. Product Name: MONOETHYLENE GLYCOL Issued: 17/07/2014

This safety data sheet has been prepared by Ixom Operations Pty Ltd Toxicology & SDS Services.

Reason(s) for Issue:
Product Name change Substance No: 000030116701

This SDS summarises to our best knowledge at the date of issue, the chemical health and safety hazards of the material and general guidance on how to safely handle the material in the workplace. Revlogi Materials cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage, assess and control the risks arising from its use of the material.

If clarification or further information is needed, the user should contact their Ixom representative or Ixom Operations Pty Ltd at the contact details on page 1.

Revlogi Materials responsibility for the material as sold is subject to the terms and conditions of sale, a copy of which is available upon request.

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