



ETHYLENE GLYCOL SDS

Safety Data Sheet

Section 1: PRODUCT AND COMPANY IDENTIFICATION

Product identifier

Product Name: ETHYLENE GLYCOL

Recommended use of the chemical and restrictions on use

Recommended Use: Used as antifreeze, heat transfer fluid, solvent, and raw material in polyester fiber manufacturing.

Restrictions on Use: None known

MANUFACTURER/SUPPLIER

Boss Lubricants
112, 6303 30 St. SE
Calgary, AB
T2C 1R4

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Section 2: HAZARD IDENTIFICATION

Hazardous Classification of the substance or mixture

Acute toxicity: Oral Category 4

Specific target organ toxicity (repeated exposure): Category 2

Label elements



Hazard pictograms:

Signal Word: Harmful if swallowed
May cause damage to organs through prolonged or repeated exposure

Precautionary Statements

Prevention: Wash face, hands and any exposed skin thoroughly after handling. Do not eat, drink or smoke when using this product. Do not breathe dust/fume/gas/mist/vapors/spray

Response: Specific treatment (see first aid instructions on label)
IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell. Rinse mouth

Storage: Store locked up. Store in a well-ventilated place. Keep container tightly closed

Disposal: Dispose of contents/container to an approved waste disposal plant

Unknown acute toxicity: No information available



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Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Chemical Name	CAS No	Weight-%	Synonyms
Ethylene Glycol	107-21-1	90 - 100%	Ethylene Glycol

Section 4: FIRST AID

Description of first aid measures

- General advice:** Show this safety data sheet to the doctor in attendance.
- Inhalation:** Remove to fresh air.
- Eye contact:** Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids. Consult a physician.
- Skin contact:** IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
- Ingestion:** Do NOT induce vomiting. Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Call a physician.
- Most important symptoms and effects, both acute and delayed:** Corneal injury is unlikely. At room temperature, exposure to vapor is minimal due to low volatility. With good ventilation, single exposure is not expected to cause adverse effects. If material is heated or areas are poorly ventilated, vapor/mist may accumulate and cause respiratory irritation and symptoms such as headache and nausea. Repeated skin exposure to large quantities may result in absorption of harmful amounts. Massive contact with damaged skin or if material sufficiently hot to burn skin may result in absorption of potential lethal amounts. Vapors or mists may cause eye irritation. May cause slight eye irritation. May be fatal if swallowed. Cardiac failure, pulmonary edema, and severe kidney damage may develop. Prolonged contact may cause skin irritation with local redness. Oral toxicity is expected to be moderate in humans due to ethylene glycol even though tests with animals show a lower degree of toxicity. Excessive exposure may cause central nervous system effects, cardiopulmonary effects (metabolic acidosis), and kidney failure. Swallowing may result in severe effects, even death. The lethal dose in adult humans for ethylene glycol is approximately 3 ounces (100 ml) (1/3 cup). May cause nausea or vomiting. May cause abdominal discomfort or diarrhea. Brief contact is essentially non-irritating to skin.

Indication of any immediate medical attention and special treatment needed:

Note to physicians: It is estimated that the oral dose to adults is of the order of 1.0 ml/kg. Ethylene glycol is metabolized by alcohol dehydrogenate to various metabolites including glyceraldehydes, glycolic acid and oxalic acid which cause an elevated anion-gap metabolic acidosis and renal tubular injury. The signs and symptoms in ethylene glycol poisoning are those of metabolic acidosis, CNS depression and kidney injury. Urinalysis may show albuminuria, hematuria and oxaluria. Clinical chemistry may reveal anion-gap metabolic acidosis and uremia. The currently recommended medical management of ethylene glycol poisoning includes elimination of ethylene glycol and metabolites, correction of metabolic acidosis and prevention of kidney injury. It is essential to have immediate and follow up urinalysis and clinical chemistry. There should be particular emphasis on acid-base balance and renal function tests. A continuous infusion of 5% sodium bicarbonate with frequent monitoring of electrolytes and fluid balance is used to achieve correction of metabolic acidosis and forced diuresis. As a competitive substrate for alcohol



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dehydrogenase, ethanol is antidotal. Given in the early stages of intoxication, it blocks the formulation of nephrotoxic metabolites. A therapeutically effective blood concentration of ethanol is in the range 100 - 150 mg/dl and should be achieved by a rapid loading dose and maintained by intravenous infusion. For severe and /or deteriorating cases, hemodialysis may be required. Dialysis should be considered for patients who are symptomatic, have severe metabolic acidosis, a blood ethylene glycol concentration greater than 25 mg/dl, or compromise of renal functions.

A more effective intravenous antidote for physician use in 4-methylpyrazole, a potent inhibitor of alcohol dehydrogenases which effectively blocks the formation of toxic metabolites of ethylene glycol. It has been used to decrease the metabolic consequences of ethylene glycol poisoning before metabolic acidosis coma, seizures and renal failure have occurred. A generally recommended protocol is a loading dose of 15 mg/kg followed by 10 mg/kg every 12 hours for 4 doses and the 15 mg/kg every 12 hours until the ethylene glycol concentrations are below 20 mg/100ml. Slow intravenous infusion is required. Since 4-methylpyrazole is dialyzable, increased dosage may be necessary during hemodialysis. Additional therapeutic measures may include the administration of cofactors involved in the metabolism of ethylene glycol. Thiamine (100 mg) and pyridoxine (50 mg) should be given every six hours.

Pulmonary edema with hypoxemia has been described in a number of patients following poisoning with ethylene glycol. The mechanism of production has not been elucidated, but it appears to be non-cardiogenic in origin in several cases. Respiratory support with mechanical ventilation and positive end expiratory pressure may be required. There may be cranial nerve involvement in the late stages of toxicity from swallowed ethylene glycol. In particular, effects have been reported involving the seventh, eighth and ninth cranial nerves, presenting with bilateral facial paralysis, diminished hearing, and dysphagia.

Section 5: FIRE-FIGHTING MEASURES

Suitable Extinguishing Media: Water fog or fine spray, carbon dioxide, dry chemical, foam. Alcohol resistant foams (ATC type) are preferred if available. General purpose synthetic foams (including AFFF) or protein foams may function, but much less effectively. Do not use direct water stream, which will spread fire.

Specific hazards arising from the substance or mixture: Use water spray to cool fire-exposed containers and structures. Isolate and restrict area access. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Container may rupture from gas generation in a fire situation. Fight fire from a safe distance and from a protected location. Do not direct a solid stream of water or foam into hot, burning pools; this may cause frothing and increase fire intensity. Consider use of unmanned hose holder or monitor nozzles.

Hazardous combustion products: Hazardous decomposition products depend upon temperature, air supply, and the presence of other materials. Hazardous decomposition products may include and are not limited to : aldehydes, ketones, organic acids.

Special protective equipment for fire-fighters: Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.



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Section 6: ACCIDENTAL RELEASE MEASURES

Personal precautions

protective equipment

and emergency procedures: Ensure adequate ventilation.

Environmental precautions: See Section 12 for additional Ecological Information. Methods and materials for containment and cleaning up. Prevent further leakage or spillage if safe to do so.

Section 7: HANDLING AND STORAGE

Precautions for safe handling: For industrial use only. Handle and open containers with care. Avoid contact with eyes, skin and clothing. Do not ingest. Avoid inhalation of chemical. Empty containers may contain hazardous product residues. Keep the containers closed when not in use. Protect against physical damage. Use appropriate personnel protective equipment. Spills of these organic materials on hot fibrous insulations may lead to lowering of the auto-ignition temperature possibly resulting in spontaneous combustion. Do not consume food, drink or smoke while handling this material.

Conditions for safe storage,

including any incompatibilities: Avoid storage with incompatible materials. Keep containers tightly closed. Keep in a cool, well-ventilated place. Do not store near food, foodstuffs, drugs or potable water supplies.

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Limits:

Chemical Name	Alberta OEL	British Columbia OEL	Ontario	Quebec OEL	Exposure Limit - ACGIH	Immediately Dangerous to Life or Health - IDLH
Ethylene Glycol 107-21-1	Ceiling: 100 mg/m ³	TWA: 10 mg/m ³ STEL: 20 mg/m ³ Ceiling: 100 mg/m ³ Ceiling: 50 ppm	CEV: 100 mg/m ³	Ceiling: 50 ppm Ceiling: 127 mg/m ³	50 ppm STEL 10 mg/m ³ STEL 25 ppm TLV-TWA	Not available

Consult local authorities for recommended exposure limits

Appropriate engineering controls

Engineering controls: General (mechanical) room ventilation is expected to be satisfactory. Local ventilation recommended where mechanical ventilation is ineffective in controlling airborne concentrations below the recommended occupational exposure limit.

Individual protection measures, such as personal protective equipment

Eye/face protection: Chemical goggles; also wear a face shield if splashing hazard exists.

Hand protection: Use gloves chemically resistant to this material, examples of preferred glove barrier materials include: Butyl rubber gloves. Nitrile gloves. Neoprene gloves. Polyvinyl alcohol gloves. Ethyl Vinyl Alcohol Laminate (EVAL). Natural rubber gloves. Polyvinylchloride (PVC) gloves. Polyethylene gloves.



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- NOTICE:** The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials as well as the instructions/specifications provided by the glove supplier.
- Skin and body protection:** Skin contact should be prevented through the use of suitable protective clothing, gloves and footwear, selected for conditions of use and exposure potential. Consideration must be given both to durability as well as permeation resistance. Chemical apron. Boots. When handling hot material, protect skin from thermal burns as well as from skin absorption.
- Respiratory protection:** Atmospheric levels should be maintained below the exposure guideline. For most conditions, no respiratory protection is needed; however, if handling at elevated temperatures without sufficient ventilation, use an approved air-purifying respirator.
- General hygiene considerations:** Handle in accordance with good industrial hygiene and safety practice.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance

Physical State:	Liquid	Odour:	Sweet
Color:	Colorless	Odour Threshold:	No information available

Properties

Melting Point/Freezing Point:	-13°C/9°F	pH:	9
Boiling Point:	>197°C/387°F	Vapor Pressure:	0.06 mmHg @ 20°C
Evaporation Rate:	0.01	Relative Vapor Density	2.1
Flash Point	111°C/232°F (Closed Cup)	Water Solubility:	1000 (RBT)
Upper Flammability Limit:	15.3	Solubility in other Solvents	No data available
Lower Flammability Limit:	3.2	% Volatility by Volume:	Not Available
Autoignition temperature:	427 °C / 801°F	Specific Gravity:	1.115 @ 20°C
Dynamic Viscosity:	19.83 mPa.s @20°C	VOCs:	Not Available
Molecular Weight:	62 g/mol	Octanol / Water Partition Coefficient:	-1.36

Section 10: STABILITY AND REACTIVITY

- Reactivity/Chemical Stability:** Stable
- Possibility of hazardous reactions:** No additional remark.
- Hazardous polymerization:** Will not occur.
- Conditions to avoid:** Avoid excessive heat, open flames and all ignition sources. Product can decompose at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems.
- Incompatible materials:** Strong oxidizers. Strong acids and bases.
- Hazardous decomposition products:**



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Hazardous decomposition products depend upon temperature, air supply, and the presence of other materials. Hazardous decomposition products may include and are not limited to : aldehydes, ketones, organic acids.

Section 11: TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

- Inhalation:** At room temperature, exposure to vapor is minimal due to low volatility. With good ventilation, single exposure is not expected to cause adverse effects. If material is heated or areas are poorly ventilated, vapor/mist may accumulate and cause respiratory irritation and symptoms such as headache and nausea.
- Eye contact:** Corneal injury is unlikely. Vapors or mists may cause eye irritation. May cause slight eye irritation.
- Skin contact:** Repeated skin exposure to large quantities may result in absorption of harmful amounts. Massive contact with damaged skin or if material sufficiently hot to burn skin may result in absorption of potential lethal amounts. Prolonged contact may cause skin irritation with local redness. Brief contact is essentially non-irritating to skin.
- Ingestion:** May be fatal if swallowed. Cardiac failure, pulmonary edema, and severe kidney damage may develop. Oral toxicity is expected to be moderate in humans due to ethylene glycol even though tests with animals show a lower degree of toxicity. Excessive exposure may cause central nervous system effects, cardiopulmonary effects (metabolic acidosis), and kidney failure. Swallowing may result in severe effects, even death. The lethal dose in adult humans for ethylene glycol is approximately 3 ounces (100 ml) (1/3 cup). May cause nausea or vomiting. May cause abdominal discomfort or diarrhea.

Information on toxicological effects

- Symptoms:** Repeated skin contact with ethylene glycol may, in a very small proportion of cases, cause sensitization with the development of allergic contact dermatitis. The incidence is significantly less than 1% with the undiluted material. Repeated inhalation of ethylene glycol may produce signs of central nervous system involvement, particularly dizziness and nystagmus (involuntary eye movement). Exposure may place individuals with existing heart problems at added risk of potential cardiac irregularities and heart failure. In animals, effects have been reported on the following organs: Kidney, liver.

Numerical measures of toxicity

Acute toxicity:

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral): 505.00 mg/kg

ATEmix (dermal): 10,707.00 mg/kg

Unknown acute toxicity: No information available

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Ethylene Glycol 107-21-1	= 4700 mg/kg (Rat)	= 10600 mg/kg (Rat)	Not available



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Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation: Repeated skin exposure to large quantities may result in absorption of harmful amounts. Massive contact with damaged skin or if material sufficiently hot to burn skin may result in absorption of potential lethal amounts. Prolonged contact may cause skin irritation with local redness. Brief contact is essentially non-irritating to skin.

Serious eye damage/eye irritation: Corneal injury is unlikely. Vapors or mists may cause eye irritation. May cause slight eye irritation.

Respiratory or skin sensitization: No information available.

Germ cell mutagenicity: No information available.

Carcinogenicity: No information available.

Chemical Name	ACGIH	IARC	NTP	OSHA
Ethylene Glycol 107-21-1	Not available	Not available	Not available	Not available
Reproductive toxicity:	Based on animal studies, ingestion of very large amounts of ethylene glycol appears to be the major and possibly only route of exposure to produce birth defects. Exposures by inhalation or skin contact, the primary routes of occupational exposure, had minimal effect on the fetus, in animal studies. Ingestion of large amounts of ethylene glycol has been shown to interfere with reproduction in animals. Specifically, growth retardation and decreased litter size in rats and mice and decreased mating frequency in mice were observed. Ethylene glycol has been shown to produce dose-related teratogenic effects in rats and mice when given by gavage or in drinking water at high concentrations or doses. The no-effect doses for developmental toxicity for ethylene glycol given by gavage over the period of organogenesis has been shown to be 150 mg/kg/day for the mouse and 500 mg/kg/day for the rat. Also, in a preliminary study to assess the effects of exposure of pregnant rats and mice to aerosols at concentrations of 150, 1000 and 2500 mg/m ³ for 6 hours a day throughout the period of organogenesis, teratogenic effects were produced at the highest concentration, but only in mice. The conditions of these latter experiments did not allow a conclusion as to whether the developmental toxicity was mediated by inhalation of aerosol, percutaneous absorption of ethylene glycol from contaminated skin, or swallowing of ethylene glycol as a result of grooming the wetted coat. In a further study, comparing effects from high aerosol concentration by whole-body or nose-only exposure, it was shown that nose-only exposure resulted in maternal toxicity (1000 and 2500 mg/m ³) and developmental toxicity with minimal evidence of teratogenicity (2500 mg/m ³). The no-effects concentration (based on maternal toxicity) was 500 mg/m ³ . In a further study in mice, no teratogenic effects could be produced when ethylene glycol was applied to the skin of pregnant mice over the period of organogenesis. The above observations suggest that ethylene glycol is to be regarded as an animal teratogen. There is currently no available information to suggest that ethylene glycol has caused birth defects in humans. Cutaneous application of ethylene glycol is ineffective in producing developmental toxicity. Exposure to high aerosol concentrations is only minimally effective in producing developmental toxicity.			

Specific target organ systemic toxicity-single exposure: No information available.





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Specific target organ systemic toxicity-repeated exposure: Causes damage to organs through prolonged or repeated exposure if swallowed.

Aspiration hazard: No information available.

Section 12: ECOLOGICAL INFORMATION

Ecotoxicity

Chemical Name	Ecotoxicity - Freshwater Algae Data	Ecotoxicity - Fish Species Data	Toxicity to microorganisms	Crustacea
Ethylene Glycol 107-21-1	6500 - 13000 mg/L EC50 Pseudokirchneriella subcapitata 96 h	41000 mg/L LC50 (Oncorhynchus mykiss) 96 h 14 - 18 mL/L LC50 (Oncorhynchus mykiss) 96 h static 27540 mg/L LC50 (Lepomis macrochirus) 96 h static 40761 mg/L LC50 (Oncorhynchus mykiss) 96 h static 40000 - 60000 mg/L LC50 (Pimephales promelas) 96 h static 16000 mg/L LC50 (Poecilia reticulata) 96 h static	Not available	EC50: =46300mg/L (48h, Daphnia magna)

Persistence and degradability: No information available.

Bioaccumulation: No information available.

Component Information:

Chemical Name	Partition coefficient
Ethylene Glycol 107-21-1	-1.93

Other adverse effects No information available.

Section 13: DISPOSAL CONSIDERATIONS

Waste treatment methods: Disposal of all wastes must be done in accordance with municipal, provincial and federal regulations. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations. Do not reuse empty containers.

Section 14: TRANSPORT INFORMATION

Basic Description: Not classified as hazardous for transport (DOT, TDG, IMO/IMDG, IATA/ICAO).

DOT

Proper Shipping Name: Not regulated for transport.

UN Number: Not regulated for transport.

Hazard Class: Not regulated for transport.





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Packing Group: Not regulated for transport.

TDG

Proper Shipping Name: Not regulated for transport.

UN Number: Not regulated for transport.

Hazard Class: Not regulated for transport.

Packing Group: Not regulated for transport.

IMDG

Proper Shipping Name: Not regulated for transport.

UN Number: Not regulated for transport.

Hazard Class: Not regulated for transport.

Packing Group: Not regulated for transport.

Marine Pollutant: Not regulated for transport.

IATA

Proper Shipping Name: Not regulated for transport.

UN Number: Not regulated for transport.

Hazard Class: Not regulated for transport.

Packing Group: Not regulated for transport.

International Bulk Chemical Code: This material does not contain any chemicals required by the IBC Code to be identified as dangerous chemicals in bulk.

Section 15: REGULATORY INFORMATION

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

U.S. Regulatory Rules

Chemical Name	CERCLA/SARA - Section 302:	SARA (311, 312) Hazard Class:	CERCLA/SARA - Section 313:
Ethylene Glycol - 107-21-1	Not Listed	Listed	Listed
International Inventories			
TSCA:	Complies		
DSL/NDSL:	Complies		

Section 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

Issue Date: September 12, 2018

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Revision Information: Update to SDS.

References

ACGIH:	American Conference of Governmental Industrial Hygienists	IMDG:	International Maritime Dangerous Goods
AIHA:	American Industrial Hygiene Association	IUCLID:	International Uniform Chemical Information Database
BOD:	Biochemical Oxygen Demand	NFPA:	National Fire Protection Association
°C:	Celsius	NIOSH:	National Institute for Occupational Safety and Health





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CAS:	Chemical Abstracts Service	NTP:	Health National Toxicology Program
CERCLA:	Comprehensive Environmental Response, Compensation, and Liability Act	OSHA:	Occupational Safety and Health Administration
CFR:	Code of Federal Regulations	PEL:	Permissible Exposure Limit
CPR:	Controlled Products Regulations	RTK:	Right-to-Know
DOT:	United States Department of Transportation	SARA:	Superfund Amendments and Reauthorization Act
DSL:	Domestic Substances List	STEL:	Short-term Exposure Limit
EPA:	Environmental Protection Agency	TDG:	Transportation of Dangerous Goods
°F:	Fahrenheit	TLV:	Threshold limit value
GHS:	Globally Harmonized System of Classification and Labeling of Chemicals	TSCA:	Toxic Substances Control Act
HMIS:	Hazardous Materials Identification System	TWA:	Time weighted average
IARC:	International Agency for Research on Cancer	UN:	United Nations
IATA:	International Air Transportation Association	WHMIS:	Workplace Hazardous Materials Information System
IDLH:	Immediately Dangerous to Life or Health		

Disclaimer This safety data sheet and the information it contains is offered to you in good faith as accurate. We have reviewed any information contained in the data sheet which we have received from outside sources and we believe the information to be correct, but cannot guarantee its accuracy or completeness. Health and safety precautions in this data sheet may not be adequate for all individuals and/or situations. It is the user's obligation to evaluate and use this product in a safe manner and to comply with all applicable laws and regulations. No statement made in this data sheet shall be construed as permission or recommendation for the use of any product in a manner that might infringe existing patents. No warranty is made, either expressed or implied.

