



Safety Data Sheet

1. PRODUCT IDENTIFICATION

Name	Glycerol
Synonyms	1,2,3-trihydroxypropane; 1,2,3-propanetriol; glycol alcohol; <i>glycerin(e) is no longer used</i>
CAS#	56-81-5
Europe EC#	200-289-5
Product Uses	resins, gums, inks, pharmaceuticals, lotions; humectant

2. HAZARDS

Quick Guide: *not hazardous* – combustible in a fire; hot liquid may cause burns; spills may be slippery

Canada – WHMIS

Key:

not controlled under WHMIS

B 2 – Flash Point <38°C, **B 3** – Flash Point >38°C & <93°C

D 1 – Immediately Toxic, **D 2** – Chronic Toxicity

C – Oxidising Substance, **E** – Corrosive, **F** – Reactive Substance

U.S.A. – HMIS

Key:

Health – 0, Fire – 1, Reactivity – 0

0=minimal, 1=slight, 2=moderate, 3=serious, 4=severe

3. COMPOSITION

	%	TWAEV / TLV mg/m ³	LD ₅₀ (mg/kg) ORAL	LD ₅₀ (mg/kg) SKIN	LC ₅₀ ppm INHALATION
1,2,3-trihydroxypropane	100%	2.7 / 10	4090	>10,000	150

4. FIRST AID

SKIN:	Wash with plenty of water. Remove contaminated clothing and do not reuse until thoroughly laundered.
EYES:	Wash eyes with plenty of water, holding eyelids open. Seek medical assistance promptly if there is irritation.
INHALATION:	Remove from contaminated area promptly. CAUTION: Rescuer must not endanger himself! If breathing stops, administer artificial respiration and seek medical aid promptly.
INGESTION:	Give plenty of water to dilute product. Do not induce vomiting (NOTE below). Keep victim quiet. If vomiting occurs, lower victim's head below hips to prevent inhalation of vomited material. Seek medical help promptly.

Inadvertent inhalation of vomited material may seriously damage the lungs. The danger of this is greater than the risk of poisoning through absorption of this relatively low-toxicity substance. The stomach should only be emptied under medical supervision, and after the installation of an airway to protect the lungs.

5. FIRE FIGHTING & FLAMMABILITY

Flash Point	199°C / 390°F (closed cup)
Autoignition Temperature	370°C / 698°F
Flammable Limits	not known
Combustion Products	carbon monoxide, nitrogen oxides, smoke, part oxidised hydrocarbon fragments
Firefighting Precautions	alcohol foam best, dry chemical, water fog/spray; firefighters must wear SCBA
Static Charge Accumulation	cannot accumulate a static charge on agitation or pumping

Please ensure that this MSDS is given to, and explained to people using this product.

6. ACCIDENTAL RELEASE MEASURES

Leak Precaution dyke to control spillage and prevent environmental contamination
 Handling Spill ventilate contaminated area; recover free liquid with suitable pumps; absorb residue on an inert sorbent, sweep & pick up using plastic or aluminium shovel, & store in closed containers for recycling or disposal

7. HANDLING & STORAGE

This product absorbs moisture from the air. Store in a dry environment, away from oxidising agents. Always ensure that containers, whether empty or full, or part full, are tightly sealed unless in use.

Avoid breathing product mist. Use with adequate ventilation.

Never cut, drill, weld or grind on or near this container. Avoid prolonged contact with skin & wash work clothes frequently. An eye bath and safety shower must be available near the workplace.

NOTE: Glycerol is very sweet (60% of the sweetness of sugar). Keep away from children & animals.

8. EXPOSURE CONTROL & PERSONAL PROTECTION

Ontario TWAEV	10mg/m ³ (mist)	Ontario STEV	not listed
ACGIH TLV	10mg/m ³ (mist)		
OSHA PEL	10mg/m ³ (mist)		
Ventilation	mechanical ventilation may be required to control airborne concentration if a mist is generated		
Hands	no special protective glove required		
Eyes	safety glasses with side shields – <i>always protect the eyes</i>		
Clothing	no special protective clothing required		

9. PHYSICAL PROPERTIES

Odour & Appearance	clear, colourless, odourless, syrupy, hygroscopic liquid with sweet taste
Odour Threshold	not known – odourless
Vapour Pressure	0.0023mmHg / 0.00031kPa (20°C / 68°F)
Evaporation Rate (<i>Butyl Acetate = 1</i>)	not considered volatile
Vapour Density (air = 1)	3.2
Boiling Range	decomposes without boiling above 290°C / 554°F; 149°C at 0.5kPa (<i>reduced pressure</i>)
Freezing Point	18°C / 64°F* – <i>supercools readily when “clean”; may not freeze until cooled to 0°C / 32°F</i>
Specific Gravity	1.264 (20/20°C)
Water Solubility	complete
Also soluble in	alcohols, glycols; insoluble in hydrocarbons, chlorinated hydrocarbons and ethers
Viscosity	1490centipoise (20°C / 68°F)
pH	none – (<i>does not liberate hydrogen ions when dissolved</i>)
Conversion Factor	1ppm = 3.76mg/m ³
Molecular Weight	92grams per mole

* *Even very small quantities of water can depress the freezing point considerably.*

10. REACTIVITY

Dangerously Reactive With permanganate)	strong oxidising agents (chromium trioxide, potassium chlorate, or potassium permanganate)
Also Reactive With	may cause explosion acetic anhydride
Stability	stable; may polymerize above 150°C / 300°F – <i>not known if this reaction is hazardous</i>
Decomposes in Presence of	heat above 290°C / 554°F
Decomposition Products	toxic acrolein fumes on thermal decomposition
Sensitive to Mechanical Impact	no

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11. TOXICITY

Effects, Acute Exposure

Skin Contact	little to no effect (<i>softens skin</i>)
Skin Absorption	slight; no toxic effects possible by this route
Eye Contact	may be slightly irritating
Inhalation	mist may be slightly irritating – <i>very low vapour pressure makes vapour unlikely; high viscosity makes mist production difficult</i>
Ingestion	little to no effect; very large doses (~½ litre) may damage red cells causing bloody urine; resolves rapidly as glycerol is metabolised or eliminated from the body within 2-3 hours

Effects, Chronic Exposure

General	little to no effect
Sensitising	not a sensitiser in humans or animals
Carcinogen/Tumorigen	not considered a tumorigen or a carcinogen in humans or animals
Reproductive Effect	no known effect in humans or animals
Mutagen	no known effect on humans or animals
Synergistic With	not known
LD ₅₀ (oral)	12,600 & 27,000mg/kg (rat), 4090, 23,000 & 38,000mg/kg (mouse), 7750 & 10,000-11,500mg/kg (guinea pig), 27,000mg/kg (rabbit)
LD ₅₀ (skin)	above 10,000, 18,700 & 23,000mg/kg (rabbit), 21,900mg/kg (rat)
LC ₅₀ (inhalation)	38ppm/143mg/m ³ (rat)

12. ECOLOGICAL INFORMATION

Bioaccumulation	readily metabolised & cannot bioaccumulate
Biodegradation	biodegrades readily & rapidly in the presence of oxygen; >50% - 98% in 5 days (several studies)
Abiotic Degradation	reacts with atmospheric hydroxyl radicals; estimated ½-life in air is 7 hours
Mobility in soil, water	water soluble; moves readily in soil and water
Aquatic Toxicity	
LC ₀ (Fish, 48hr)	>10,000mg/litre (Leuciscus idus & Idus idus) – <i>this is an LC₀; no mortality, so virtually non-toxic</i>
LC ₁₀₀ (Fish, 96hr)	51,000-56,000mg/litre (Oncorhynchus mykiss) – <i>100% mortality, but very high dose used</i>
LC ₅₀ (Fish, 24hr)	>5000mg/litre (Carassius auratus)
EC ₅₀ (Crustacea, 24hr)	>10,000mg/litre (Daphnia magna) – <i>virtually non-toxic</i>
TGK 3% (Algae)	2900mg/litre (Microcystis aeruginosa), >10,000mg/litre (Scenedesmus quadricauda)
EC ₀ (Bacteria)	>10,000mg/litre (Pseudomonas putida), >170,000mg/litre (Clostridium pasteurianum)

Some tests show that the presence of glycerol actually enhances the growth rate of algae or bacteria which are clearly using it as a nutrient. Glycerol has very low toxicity to aquatic life.

13. DISPOSAL

Waste Disposal	do not flush to sewer , recycle if possible, if local regulations permit, may be put in sanitary landfill, may be incinerated in approved facility after mixing with a flammable waste; Glycerol is a good candidate for on-site biodegradation.
Containers	Drums should be reused. Recondition and pressure test by a licensed reconditioner prior to re-use. Pails must be vented and thoroughly dried prior to crushing and recycling. IBCs (intermediate bulk containers): polyethylene bottle must be pressure tested & recertified at 30 months. Replace at 60 months (5yrs). Steel containers must be inspected, pressure tested & recertified every 5 years. Never cut, drill, weld or grind on or near this container, even if empty

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14. TRANSPORT CLASSIFICATION

Canada TDG	PIN	UN – not regulated for transport
AND	Shipping Name	not regulated for transport
U.S.A. 49 CFR	Class & Packing Group	not regulated for transport
Marine Pollutant		not a marine pollutant
ERAP Required		NO

EMERGENCY INFORMATION

Canada	Call CANUTEC (collect)	(613) 996-6666
U.S.A.	Call CHEMTREC	(800) 424-9300

15. REGULATIONS

Canada DSL	on inventory
U.S.A. TSCA	on inventory
Europe EINECS	on inventory
Europe Classification	not considered hazardous in Europe

Allowable Tolerances: Residues resulting from the use of the following substances as either an inert or an active ingredient in a pesticide chemical formulation, including antimicrobial pesticide chemicals, are exempted from the requirement of a tolerance under FFDCa section 408, if such use is in accordance with good agricultural or manufacturing practices. Glycerin is included on this list.

OSHA Standards: Permissible Exposure Limit: Table Z-1 8-hr Time Weighted Avg: 15 mg/cu m. /Mist, total dust/ Permissible Exposure Limit: Table Z-1 8-hr Time Weighted Avg: 5 mg/cu m. /Mist, respirable fraction/ Vacated 1989 OSHA PEL TWA 10 mg/cu m is still enforced in some states. /Mist, total/ Vacated 1989 OSHA PEL TWA 5 mg/cu m is still enforced in some states. /Mist, resp/

NIOSH Recommendations: NIOSH concluded that the documentation cited by OSHA was inadequate to support the proposed PEL (as an 8 hour TWA) of 10 mg/cu m for glycerine (mist).

Threshold Limit Values: 8 hr Time Weighted Avg (TWA): 10mg/m³. /Glycerin mist/ Excursion Limit Recommendation: Excursions in worker exposure levels may exceed 3 times the TLV-TWA for no more than 30 minutes during a work day, & under no circumstances should exceed 5 times the TLV-TWA, provided that the TLV-TWA is not exceeded. /Glycerin mist/ 2011 Notice of Intended Changes: These substances, with their corresponding values and notations, comprise those for which (1) a limit is proposed for the first time, (2) a change in the Adopted value is proposed, (3) retention as an NIC is proposed, or (4) withdrawal of the Documentation and adopted TLV is proposed. In each case, the proposals should be considered trial values during the period they are on the NIC. These proposals were ratified by the ACGIH Board of Directors and will remain on the NIC for approximately one year following this ratification. If the Committee neither finds nor receives any substantive data that changes its scientific opinion regarding a NIC TLV, the Committee may then approve its recommendation to the ACGIH Board of Directors for adoption. If the Committee finds or receives substantive data that change its scientific opinion regarding a NIC TLV, the Committee may change its recommendation to the ACGIH Board of Directors for the matter to be either retained on or withdrawn from the NIC. Substance: Glycerin, mist (56-81-5); Withdraw adopted Documentation and TLV.

Atmospheric Standards: This action promulgates standards of performance for equipment leaks of Volatile Organic Compounds (VOC) in the Synthetic Organic Chemical Manufacturing Industry (SOCMI). The intended effect of these standards is to require all newly constructed, modified, and reconstructed SOCMI process units to use the best demonstrated system of continuous emission reduction for equipment leaks of VOC, considering costs, non air quality health and environmental impact and energy requirements. Glycerol is produced, as an intermediate or a final product, by process units covered under this subpart.

FIFRA Requirements: Residues resulting from the use of the following substances as either an inert or an active ingredient in a pesticide chemical formulation, including antimicrobial pesticide chemicals, are exempted from the requirement of a tolerance under FFDCa section 408, if such use is in accordance with good agricultural or manufacturing practices. Glycerin is included on this list. As the federal pesticide law FIFRA directs, EPA is conducting a comprehensive review of older pesticides to consider their health and environmental effects and make decisions about their future use. Under this pesticide reregistration program, EPA examines health and safety data for pesticide active ingredients initially registered before November 1, 1984, and determines whether they are eligible for reregistration. In addition, all pesticides must meet the new safety standard of the Food Quality Protection Act of 1996. Pesticides for which EPA had not issued Registration Standards prior to the effective date of FIFRA, as amended in 1988, were divided into three lists based upon their potential for human exposure and other factors, with List B containing pesticides of greater concern and List D pesticides of less concern. Glycerol is found on List D. Case No: 4044; Case Status: No products containing the pesticide are actively registered ...

FDA Requirements: Substances migrating to food from paper and paperboard products used in food packaging that are generally recognized as safe for their intended use, within the meaning of section 409 of the Act: Glycerin is included on this list. Glycerin used as a multiple purpose GRAS food substance in food for human consumption is generally recognized as safe when used in accordance with good manufacturing practice. Glycerin used as a general purpose food additive in animal drugs, feeds, and related products is generally recognized as safe when used in accordance with good manufacturing or feeding practice.

16. OTHER INFORMATION

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Data from RTECS, HSDB (Haz. Substance Data Base), Cheminfo (CCOHS), IUCLID Datasheets (ESIS – European Chem. Substance Info. System), & others.

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