



## Safety Data Sheet

### 1. PRODUCT IDENTIFICATION

Name	<b>Diethylene Glycol</b>
Synonyms	dihydroxydiethyl ether; 2,2-oxydiethanol; 2-hydroxyethyl ether
CAS#	111-46-6
Europe EC#	203-872-2
Product Uses	mfg of resins & polyols; antifreeze, dehydrating agent, component of inks, etc

### 2. HAZARDS

**Quick Guide:** will burn in fire; toxic substances form in fire; may ignite on hot surface; toxic on ingestion

#### Canada – WHMIS

Key:

#### D 1B

**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 – 2, Fire – 1, Reactivity – 0

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

### 3. COMPOSITION

	%	TWAEV / TLV mg/m <sup>3</sup>	LD <sub>50</sub> (mg/kg) ORAL	LD <sub>50</sub> (mg/kg) SKIN	LC <sub>50</sub> ppm INHALATION
2-hydroxyethyl ether	100%	not listed	2300	11,890	1070

### 4. FIRST AID

**SKIN:** Wash with water. Remove contaminated clothing and do not reuse until 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 124°C / 255°F (closed cup)

Autoignition Temperature 224°C / 435°F

Flammable Limits 1.6% – 10.8%

Combustion Products carbon monoxide, nitrogen oxides, smoke, part oxidised hydrocarbon fragments, including (irritating) formaldehyde

Fire Fighting Precautions foam, dry chemical, water fog, water spray – water jet spreads flames; firefighters must wear SCBA

Static Charge Accumulation cannot accumulate a static charge

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**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,  
 shovel & store in closed containers for recycling or disposal

**7. HANDLING & STORAGE**

Diethylene glycol absorbs moisture from the air. Store in a dry environment, away from sources of open flame, oxidising agents and substances listed in Part 10.

This product may react with oxygen in the air to form explosive or flammable peroxides. Ensure that containers are full and tightly sealed. If prolonged storage of a part container is anticipated, flush headspace with dry nitrogen gas prior to sealing. 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 contact with skin and wash work clothes frequently. An eye bath and safety shower must be available near the workplace.

*Sweet taste makes glycols attractive to pets and children. Keep away from children and clean spills promptly.*

**8. EXPOSURE CONTROL & PERSONAL PROTECTION**

Ontario TWAEV	not listed – <i>AIHA WEEL is 10 mg/m<sup>3</sup> / 2.3ppm</i>
ACGIH TLV	not listed
OSHA PEL	not listed
Ventilation	not required; if visible mist is generated, install mechanical ventilation at source
Hands	no special protective gloves required; nitrile or butyl gloves are resistant to diethylene glycol
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, viscous, hygroscopic liquid with a sweet taste
Odour Threshold	not known – odourless
Vapour Pressure	0.0057mmHg / 0.00076kPa (25°C / 77°F)
Evaporation Rate ( <i>Butyl Acetate = 1</i> )	0.001 – <i>not considered volatile</i>
Vapour Density (air = 1)	3.7
Boiling Range	246°C / 475°F
Melting Point	-10.5°C / 13°F – <i>supercools to well below this temperature</i>
Specific Gravity	1.118 (20/20°C)
Water Solubility	complete
Also soluble in	alcohols, ketones, ethers, esters; limited solubility in hydrocarbons
Viscosity	38centipoise (20°C / 68°F)
pH	none – ( <i>does not liberate hydrogen ions when dissolved</i> )
Conversion Factor	1ppm = 4.3mg/m <sup>3</sup>
Molecular Weight	106grams per mole

**10. REACTIVITY**

Dangerously Reactive With	strong oxidising agents & hypochlorites; reacts with powdered metals: aluminium, zinc, or alkali metals: sodium, potassium, lithium, or their hydrides releases hydrogen & creates alkali; reacts with boron trichloride & aluminium chloride to produce hydrogen chloride gas
Also Reactive With	epoxides, strong acids & acid anhydrides, carbon disulphide, halogens & isocyanates
Stability	stable; will not polymerize
Decomposes in Presence of heated	air to form peroxides which may explode; oxidation is faster in the presence of acid & if
Decomposition Products	none apart from Hazardous Combustion Products
Sensitive to Mechanical Impact	no

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## 11. TOXICITY

### Effects, Acute Exposure

Skin Contact	little to no effect
Skin Absorption	slight; no toxic effects by this route
Eye Contact	may be slightly irritating
Inhalation	little to no effect; low vapour pressure makes vapour formation unlikely; diethylene glycol is used to create theatrical mist with no reported consequences
Ingestion*	ingestion in amounts similar to those producing intoxication with alcohol cause similar effects; headache, dizziness, drowsiness; <i>not a route of occupational exposure</i>

### Effects, Chronic Exposure

General	experimental long-term ingestion has produced renal stones & liver damage in rodents
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	consumption of ethyl alcohol
LD <sub>50</sub> (oral)*	2300 & 28,100mg/kg (mouse), 3300 & 3400mg/kg (cat), 4400 – 44,000mg/kg (rabbit),
( <i>Note very broad range of oral LD<sub>50</sub></i> )	7800 – 30,000mg/kg (rat), 8000-9900mg/kg (dog), 7800 – 13,200mg/kg (guinea pig)
LD <sub>50</sub> (skin)	11,890 & 13,300mg/kg (rabbit)
LC <sub>50</sub> (inhalation)	above 1070ppm (rat)

\* **NOTE on oral toxicity:** *Diethylene glycol is more toxic in humans than to the laboratory animals used in testing (above). Obviously, LD<sub>50</sub> testing cannot be carried out on humans. In 1937, 105 people (34 children, 71 adults) died after ingesting an elixir containing 72% diethylene glycol, 8% sulfanilamide & 20% flavours, saccharin, caramel, plus 10% water for 6-13 days. More recently, half of a group of male prisoners, who had ingested diethylene glycol for 2 years (as a cleaning solution), were found to be suffering some neurological abnormalities. However, ingestion is not an expected route of entry for this industrial substance.*

## 12. ECOLOGICAL INFORMATION

Bioaccumulation	highly water soluble; cannot bioaccumulate
Biodegradation	biodegrades readily in the presence of oxygen; a wide range of degradation rates are seen: 30% to 70% in 20 – 30 days; also, over 90% after 28 days
Abiotic Degradation	reacts with atmospheric hydroxyl radicals; estimated ½-life in air is 6 to 12 hours
Mobility in soil, water	water soluble; moves readily in soil & water
<b>Aquatic Toxicity</b>	
LC <sub>50</sub> (Fish, 96hr)	>32,000mg/kg ( <i>Gambusia affinis</i> ), >10,000mg/kg ( <i>Leuciscus idus</i> , 48hr), >5000mg/kg ( <i>Carassius auratus</i> , 24hr),
LC <sub>50</sub> (Crustacea, 24hr)	>10,000mg/kg ( <i>Artemia salina</i> ), >10,000mg/kg ( <i>Daphnia magna</i> )
NOEC (Algae)	800mg/litre ( <i>Anacystis aeruginosa</i> )
EC <sub>0</sub> (Algae)	1700mg/litre ( <i>Microcystis aeruginosa</i> ) – <i>this is an EC<sub>0</sub>, not an EC<sub>50</sub> – no effect at this dose</i>
EC <sub>50</sub> (Bacteria)	29,228mg/litre ( <i>Photobacterium phosphoreum</i> , 15min), 40,000mg/litre (mixed bacterial culture)
NOEC (Bacteria)	4000mg/litre ( <i>Chilomonas paramecium</i> ), 8000mg/litre ( <i>Pseudomonas putida</i> )

## 13. DISPOSAL

Waste Disposal	<b>do not flush to sewer</b> , recycle solvent if possible, local regulations may permit disposal in sanitary landfill, may be incinerated in approved facility after mixing with a flammable waste
Containers	<b>Drums</b> should be reused. Recondition and pressure test by a licensed reconditioner prior to re-use. <b>Pails</b> must be vented and thoroughly dried prior to crushing and recycling. <b>IBCs</b> (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. <i>Never cut, drill, weld or grind on or near this container, even if empty</i>

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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 Harmful



Europe Risk Phrases **R: 22** – Harmful if swallowed.

Europe Safety Phrases **S: 46** – If swallowed, seek medical advice immediately.

**Allowable Tolerances:** Residues of diethylene glycol are exempted from the requirement of a tolerance when used in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops only. Use: deactivator, adjuvant for formulations used before crop emerges from soil. Residues of diethylene glycol are exempted from the requirement of a tolerance when used in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops only. Use: deactivator for formulations used before crop emerges from soil, stabilizer.

**FIFRA Requirements:** Residues of diethylene glycol are exempted from the requirement of a tolerance when used in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops only. Use: deactivator, adjuvant for formulations used before crop emerges from soil. Residues of diethylene glycol are exempted from the requirement of a tolerance when used in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops only. Use: deactivator for formulations used before crop emerges from soil, stabilizer.

**FDA Requirements:** Diethylene glycol is an indirect food additive for use only as a component of adhesives.

**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.

Preparation Date: June 2001 Revision Date: December 2003, October 2006, October 2009; October 2012

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