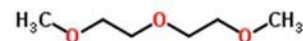


RCT**Rierden Chemical & Trading Company****115 West Church Street****P.O. Box 7072****Libertyville, IL 60048****Tel (847) 816-9310 Fax (847) 816-6364****sales@rierdenchemical.com****Safety Data Sheet****Diethylene Glycol Dimethyl Ether****I IDENTIFICATION**

Synonyms bis(2-methoxyethyl)ether; 1,1'-oxybis(2-methoxyethane), 2,5,8-trioxanonane, DEGDME, diglyme
CAS # 111-96-6
Europe EC # 203-924-4
Material Use solvent, medium for organometallic reactions, production of plastics

EMERGENCY INFORMATION

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

II HAZARD IDENTIFICATION

GHS Class flammable liquid reproductive toxin
(Category) (3) (1B)
Signal Words WARNING DANGER

Hazard Statements flammable liquid may damage fertility
 & vapour (H226) and the unborn child (H360)

**GHS Precautionary Statements for Labelling**

P210 Keep away from heat, sparks, open flames and hot surfaces. No smoking.
P240 Ground or bond container and receiving equipment.
P241 Use explosion-proof electrical, ventilating and lighting equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P370, P378 In case of fire use alcohol-resistant foam to extinguish.

III COMPOSITION

	CAS NUMBER	%	TLV ppm / mg/m ³	LD ₅₀ (mg/kg) ORAL	LD ₅₀ (mg/kg) SKIN	LC ₅₀ ppm INHALATION
Diethylene Glycol Dimethyl Ether	111-96-6	100%	not listed	>2980	>5000	>11,000

IV FIRST AID

SKIN: Wash with soap and plenty of water. Remove contaminated clothing and do not reuse until thoroughly cleaned or laundered. Seek medical help promptly if there is persistent itching or redness in the affected area.
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 victim's 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.

NOTE: 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 product. The stomach should only be emptied under medical supervision, after the installation of an airway to protect the lungs.

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V FLAMMABILITY & FIRE-FIGHTING

Flash Point	51°C / 124°F, 59°C / 138°F, 67°C / 153°F & 70°C / 158°F – all from Reference#1
Autoignition Temperature	190°C / 374°F ¹
Flammable Limits	1.3% – 17.4% ¹
Combustion Products	carbon monoxide, nitrogen oxides, smoke, part oxidised hydrocarbon fragments
Firefighting Precautions	foam, dry chemical, water fog, water spray only to cool & dilute, product floats on water – water jet spreads flames; firefighters must wear SCBA
Static Discharge	cannot accumulate a static charge

VI ACCIDENTAL RELEASE MEASURES

Leak Precaution	dyke to control spillage and prevent environmental contamination
Handling Spill	recover free liquid with suitable pumps; absorb residue on an inert sorbent, sweep, shovel & store in closed containers for disposal

VII HANDLING & STORAGE

Store & use in a cool, dry environment, away from sources of ignition, oxidising agents & substances listed in Part X.

Potentially explosive peroxides can accumulate in this product on prolonged storage in contact with air. If prolonged storage of a part container is anticipated, flush headspace with dry nitrogen gas prior to sealing. Empty containers may contain a flammable/explosive vapour. Never cut, drill, weld or grind on or near this container, whether empty or full. Always replace drum, pail or IBC cap prior to moving the container!

Avoid generating or breathing product vapour or mist. If vapour or mist are produced during use, install adequate mechanical exhaust ventilation. Avoid prolonged contact with skin and wash work clothes frequently. An eye bath & safety shower should be available near the workplace.

VIII EXPOSURE CONTROL & PERSONAL PROTECTION

ACGIH TLV	not listed	ACGIH STEL	not listed
OSHA PEL	not listed	OSHA STEL	not listed
Hands	no specific glove recommendation is available; butyl rubber & “Viton” protect well against other diethylene glycol ethers – <i>always confirm suitability with supplier</i>		
Eyes	safety glasses with side shields – <i>always protect eyes!</i>		
Clothing	no special protective clothing required		

IX PHYSICAL AND CHEMICAL PROPERTIES

NOTE: for Flash Point, Autoignition Temp, & Flammable Limits see Part 5.

Odour & Appearance	clear, colourless, liquid with an ether odour
Odour Threshold	not known
Vapour Pressure	2.96mmHg / 0.39kPa (25°C / 77°F)
Evaporation Rate (Butyl Acetate = 1)	0.36
Vapour Density (air = 1)	4.6
Decomposition Temperature	not known – <i>no decomposition to the boiling point</i>
Boiling Point	162°C / 324°F ¹ – <i>several other values reported very close to this</i> ¹
Freezing Point	-64°C to -71°C / -83°F to -96°F – <i>three reports</i> ¹
Specific Gravity	0.945 (20/20°C)
Water Solubility	940 grams/litre (20°C / 68°F) ¹
- in other solvents	ethanol, methanol
Log K _{ow} (Octanol/H ₂ O Partition Coefficient)	-0.36 ¹
Viscosity	1.0-1.1centipoise (20°C / 68°F) ¹
pH	none – <i>does not yield hydrogen ions in solution</i>
Molecular Weight	134grams/mole

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X REACTIVITY

Dangerously Reactive With	strong oxidising agents; sulphuric acid, isocyanates, perchloric acid & metal halides
Also Reactive With	dissolves polyvinyl chloride, polymethacrylate, polystyrene, polychloroprene, cellulose acetate
Chemical Stability	stable; will not polymerize
Decomposes in Presence of	air, light
Decomposition Products	shock-sensitive peroxides form gradually on exposure to air
Mechanical Impact	not sensitive

XI TOXICITY INFORMATION**i. ACUTE EXPOSURE**

Skin Contact	not irritating ¹
Skin Absorption	probably not; toxic effects unlikely by this route
Eye Contact	not irritating ¹
Inhalation	dizziness, intoxication seen in rodents at 20,000mg/m ³ (<i>LC₅₀ test below</i>) ¹
Ingestion	not known – <i>low toxicity & not a route of industrial exposure</i>
LD ₅₀ (oral)	4760 ¹ , 5400mg/kg (rat), 2980 ¹ , 6000mg/kg (mouse)
LD ₅₀ (skin)	>5000mg/kg (rat) – <i>no mortality in this test</i> ¹
LC ₅₀ (inhalation)	>11,000 & >20,000mg/m ³ (rat) – <i>no mortality occurred in these tests</i> ¹

ii. CHRONIC EXPOSURE

General	prolonged or repeated exposure may cause dermatitis through removal of protective skin oils
Sensitising	not a sensitiser ¹
Carcinogen/Tumorigen	not known to be a tumorigen or a carcinogen in humans or animals ¹
Reproductive Effect	no known effect on humans; testicular atrophy in rats after 98ppm for 2 weeks; sperm abnormality in mice after 250ppm for 5 days; testicular abnormality in rats after 680mg/kg (oral) for 20 days; after 400ppm (days 7-10 of gestation) rats resorbed their foetuses – 100ppm had no effect
Mutagen	not known to be a mutagen or teratogen in humans; not a mutagen “ <i>in vitro</i> ” ¹ , birth defects after rat mothers ingested >125mg/kg/day (<i>without maternal toxicity</i>) – <i>not a route of industrial exposure</i>
Synergistic With	smoking potentiates testicular effects of this product
NOEL (maternal)	500mg/kg/day (rat, oral) ¹ – <i>rat mothers whose pups were affected (below)</i>
NOEL (developmental)	62.5mg/kg/day (rat, oral) ¹

XII ECOLOGICAL INFORMATION

Bioaccumulation	readily metabolised and will not bioaccumulate
Biodegradation	variable: 20% in 10 days & 33% - 40% in 25 days, 30% in 28 days ¹ ; 95% in 28 days ¹ , 26% in 15 days ¹
Abiotic Degradation	reacts with atmospheric hydroxyl (OH) radicals; estimated ½-life in air of 5hr & 22 hours
Mobility in soil, water	water soluble; moves readily through soil and the water column
Aquatic Toxicity	
LC ₅₀ (Fish 96 hr)	10,970mg/litre (Lepomis macrochirus), >2000 ¹ & 11,970mg/litre (Leuciscus idus), 8570mg/litre (Pimephelas promelas), 9845mg/litre (Salmo gairdneri), >5000mg/litre (Danio rerio) ¹
LC ₅₀ (Crustacea, 48hr)	943 ¹ & 5870mg/litre (Daphnia magna)
EC ₅₀ (Algae, 96hr)	>1000mg/litre (Desmodesmus subspicatus) ¹ , >10,000mg/litre (Pseudokirchnerella subcapitata) ¹
EC ₁₀ (Microorganisms)	>1000mg/litre (“activated sludge”) ¹
EC ₂₀ (Microorganisms)	1067mg/litre (“activated sludge”) ¹

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XIII DISPOSAL CONSIDERATIONS

Waste Disposal **do not flush to sewer**; recycle if possible* incinerate in approved facility with flue gas monitoring & scrubbing

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 (5 years). Steel containers must be inspected, pressure tested & recertified every 5 years.
Warning: never cut, drill, weld or grind on or near this container, even if empty.

*** NOTE: Potentially explosive peroxides may have accumulated in this product on prolonged storage. Never distil to dryness!**

XIV TRANSPORT INFORMATION**USA 49 CFR & Canada TDG**

Product Identification Number	UN – 3271
Shipping Name	ethers N.O.S. (diethylene glycol dimethyl ether)
Classification	Class 3; Packing Group III
Marine Pollution	not a marine pollutant
ERAP Required	No
Reportable Quantity (RQ)	none



***Not regulated for US DOT Ground transport in Containers < 120 gallons.**

XV REGULATIONS

Canada DSL	on inventory
U.S.A. TSCA	ACTIVE
Europe EINECS	on inventory

SARA:Physical Hazards

- ☐ Explosive
- ☒ Flammable
- ☐ Oxidizer (liquid, solid or gas)
- ☐ Self-reactive
- ☐ Pyrophoric (liquid or solid)
- ☐ Pyrophoric Gas
- ☐ Self-heating
- ☐ Organic peroxide
- ☐ Corrosive to metal
- ☐ Gas under pressure (compressed gas)
- ☐ In contact with water emits flammable gas
- ☐ Combustible Dust
- ☐ Hazard Not Otherwise Classified

Chemical Hazards

- ☐ Acute toxicity (any route of exposure)
- ☐ Skin corrosion or irritation
- ☐ Serious eye damage or eye irritation
- ☐ Respiratory or skin sensitization
- ☐ Germ cell mutagenicity
- ☐ Carcinogenicity
- ☒ Reproductive toxicity
- ☒ Specific target organ toxicity (single or repeated ex.)
- ☐ Aspiration hazard
- ☐ Simple Asphyxiant
- ☐ Hazard Not Otherwise Classified

U.S.A. Regulations:

NIOSH Recommendations: NIOSH recommends reducing exposure to lowest feasible concn & preventing contact with the skin. /Glycol ethers/

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. Diethylene glycol dimethyl ether is produced, as an intermediate or final product, by process units covered under this subpart.

TSCA Requirements: Section 8(a) of TSCA requires manufacturers of this chemical substance to report preliminary assessment information concerned with production, exposure, and use to EPA as cited in the preamble in 51 FR 41329. Pursuant to section 8(d) of TSCA, EPA promulgated a model Health and Safety Data Reporting Rule. The section 8(d) model rule requires manufacturers, importers, and processors of listed chemical substances and mixtures to submit to EPA copies and lists of unpublished health and safety studies. Diethylene glycol dimethyl ether is included on this list.

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XVI OTHER INFORMATION

Date of Preparation August 2011

Date of Revision May 2013, May 2016, November 2017, February 2019 (D. Moreno)

Prepared for Rierden Chemical & Trading Company, by **Peter Bursztyn**

With data from Registry of Toxic Effects of Chemical Substances (RTECS - USA), Hazardous Substance Data Base (HSDB - USA), Cheminfo (CCOHS - Canada), OSHA website, European Chemicals Agency (EChA) dossiers & other sources (below if used), as required/available.

(1) European Chemicals Agency (EChA) dossier on bis(2-methoxyethyl) ether:

<http://echa.europa.eu/registration-dossier/-/registered-dossier/13478>

last page of SDS

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