العالمية للدايول

INTERNATIONAL DIOL COMPANY

MATERIAL SAFETY DATA SHEET
TETRAHYDROFURAN

1. PRODUCT MANUFACTURER INFORMATION

Product Name	Tetrahydrofuran
Manufacturer	International Diol Company PO Box 12021 Jubail Industrial City - 31961 Kingdom Of Saudi Arabia.
Emergency Telephone No	+966 3 359 9985 (24 hours)
ID No	CAS NO: 109-99-9
Company (affiliate) website	http://sipchem.com/en/affiliates.htm

2. HAZARDOUS COMPONENTS

Material Name:	Tetrhydrofuran	> 99 %
Trace Impurities:	Butyl Methyl Ether, Methyl Propionate, Methanol	

3. PRODUCT INFORMATION

Product Name	Tetrhydrofuran (THF)
Trade Name/Synonyms	Diethylene oxide, Oxacyclopentane, 1,4 Epoxy butane.
U.N. Number	UN 2056
Product Use	Used as resin solvent,polytetrahydrofuran,

4. FIRST AID INFORMATION

Skin	Remove contaminated clothing including footwear after rinsing with water. Wash affected areas with water & soap. Seek medical attention if irritation persists.
Eye	Flush eyes immediately for at least 15 minutes with running water. Obtain medical attention.
Inhalation	Remove to fresh air, Lay the patient down, restore or assist breathing if necessary. Obtain medical attention immediately.
Ingestion.	Do not induce vomiting, Give a glass of water. Obtain medical attention immediately.

POTENTIAL HEALTH EFFECTS

Target Organs	Eyes, central nervous system.skin,respiratory system.
Entry Routes	Inhalation,Ingestion,skin/eye contact.
Inhalation	Harmful if inhaled.Disconforting the respiratory tract if moderately inhaled. Overexposure may cause irritation in mucous membrane, coughing, chest pains,nausea,headache and narcosis. Exposure to high concentration can affect the central nervous system due to narcotic effect. Other symptoms include muscular hypotonic and disappearance of corneal reflexes followed by coma and death.
Eye:	Highly discomforting to the eyes, may cause chemical burns, pain and severe conjunctivitis. Corneal injury may develop with permanent vision Impairment if adequate or prompt treatment is not taken.
Skin:	Causes dermatitis. Open cuts, abraded skin should not be exposed to the material. Toxic effects results in skin absorption.
Ingestion:	Discomforting to the gastrointestinal tract and harmful if swallowed.

	On ingestion tetrahydrofuran itself will not cause internal injury, However furan present in certain grades may cause liver and kidney damage.
Exposure Limits	OSHA PEL TWA: 200 ppm ; 590 mg/m3 NIOSH TWA :200 ppm,590 mg/m3 , STEL 250 ppm ,735 mg/m3 DFG (Germany) MAK TWA: 50 ppm; Peak 100 ppm skin. IDLH Level: 2000 ppm (10 % LEL) ACGIH TWA : 200 ppm; STEL : 250 ppm
Long Term Effects	Repeated exposure has been associated with cytolytic hepatitis and fatty degeneration of the liver. Inhalation of THF concentration > 3000 ppm,8 hrs/day for 20days produced irritation and evidence of hepatic and renal injury in animals.
Teratogenicity	No data available.
Mutagenicity	No data available.
Carcinogenicity	No data available.

5. FIRE FIGHTING MEASURES

Fire hazards	Liquid and vapors are highly flammable. Dangerous hazard when exposed to heat, flame and oxidizers.Vapour may readily form an explosive mixture with air. May form explosive peroxides on standing or following concentration by distillation. Heating may cause expansion or decomposition leading to violent rupture of containers. Decomposes on heating and produces toxic fumes of carbon dioxide & carbon monoxide.
Fire-Fighting	Avoid spraying water onto liquid pools. Fire fighters must wear breathing apparatus and protective gloves. Prevent spillage entering drains and waterways by all means. Cool fire exposed containers with water spray from protected location. May be violently or explosively reactive.

6. ACCIDENTAL RELEASE MEASURES

Flash Point	-14.4 deg C closed cup.
Auto ignition	321 deg C.
Explosive Limit	LEL : 2 % v/v , UEL : 11.8 % v/v.
Extinguishing Media	Alcohol stable foam, Dry chemical powder,BCF (If regulation permit) Carbondioxide.For large fires –Water spray or fog. **Note:** Water may be ineffective extinguishing media. The vapor pressure of even dilute solutions in a 0.3 % solution in water has a flash point of 70 degC.

7. HANDLING AND STORAGE

Storage	Storage tanks of carbon steel with nitrogen blanketing & safe venting.
Handling	Ground and secure containers when dispensing or pouring. Use spark proof tools & explosion proof equipments. No smoking and bare lights or ignition sources near storage and handling areas.Vapour may ignite on pumping or pouring due to static electricity.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering Controls	General exhaust is adequate in normal operating condition.Provide

	adequate ventilation in warehouse or closed storage areas.
Gloves	Rubber,Neoprene,PVA gloves
Respiratory	2000 to Unlimited exposure range – Self contained breathing apparatus Pressure demand ,full face cartridge.
Eye	Ready access to eye shower unit and chemical goggles, full face shield.
Clothing	Impervious protective clothing ,rubber apron.

9. PHYSICAL AND GHEMICAL PROPERTIES

Physical State	liquid with ether like odor.
Appearance	colorless
Specific Gravity	0.891 gm/cc at 20 DegC
Freezing Point	-108.5 deg C.
Boiling Point	66 degC at 760 mm Hg.
Vapor Pressure kPa	19.1 @ 20 Deg C
Vapor Density (air=1)	2.5
Molecular Weight	72.11
Volatility % v/v	100 %

10. STABILITY AND REACTIVITY

Stability	Product is considered stable under normal handling and storage Conditions when it is stablished with BHT. (3,5-Di-tert-butyl-4-hydroxybutoxytoluene)
Incompatible with	Oxidizing agents, acids, bases, lithium aluminum hydride, sodium or Potassium hydroxide, cationic initiators such as Lewis acid or strong Proton acids.
Conditions of Reactivity	In the absence of stabilizer autooxidation takes place to 2 –hydroperoxide which when heated decomposes and if accumulated over period it transforms to other peroxide species which violently decompose.

11. TOXICOLOGICAL INFORMATION

Toxicity

Oral (Human) LDlo : 50 mg/kg
Oral (Rat) LD50 : 2816 mg/kg
Inhalation (Human) TClo :25000 ppm
Inhalation (Rat) LC50 :2100 ppm/3h

12. ECOLOGICAL INFORMATION

Environmental Fate	Once released to the environment its behavior is not well understood as data is not available. Spills on soil are expected to evaporate quickly or leach into ground water.
Ecotoxicity	LC 50 Pimephales promelas (Feathed minnow) 2160 mg/196 hr flow through bioassay,wt 0.12g,water hardness 45.5 mg/l CaCo3,temp 25 'C dissolved oxygen > 60% Concentration.

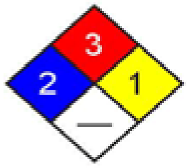
13. DISPOSAL CONSIDERATIONS

Spill	Small spill can be absorbed with vermiculite or absorbent material Place the spilled material in clean dry ,labeled container.

	Wash the spilled area with detergent and water. Large spill : Stop leak if safe to do so. Clear Personnel and move upwind. May be violently or explosively reactive. Prevent by all means entry into drains and water ways. Shut off all possible source of ignition. Water spray or fog may be used to disperse vapour.Contain the spill with sand, earth or absorbent material and collect in labeled drums for disposal.
Disposal	Follow applicable OSHA regulation 29 CFR 1910.120

14. TRANSPORT INFORMATION

Shipping Name	TETRAHYDROFURAN
Hazard Class	3- Flammable and combustible material
ID No	UN 2056
Packing Group	II- Medium danger
Label	3- Flammable liquid
NFPA Rating	Health =2, Fire = 3,Reactivity =1



Fire Diamond

15. REGULATORY INFORMATION

Regulations vary from country to country. Anyone who uses, transports or stores this product, should refer to country specific regulations. Following are a few sample regulations for reference only:

RCRA 40 CFR	**listed U213 Ignitable waste**
CERCLA 40 CFR 302.4	**listed as per RCRA Section 3001- 1000lb**
TSCA	**listed**
SARA 40 CFR 372.65	**Not listed.**
SARA EHS 40 CFR 355	**Not listed.**

16. OTHER INFORMATION

The information and recommendations herein are taken from data contained in independent, industry recognized references. Although reasonable care has been taken in the preparation of the information herein, Sipchem and International Diol Company. make no guarantee, warranty (express or implied) or other representation and assume no responsibility as to the accuracy or suitability of such information for application of the information, since conditions of its use are beyond control of these companies. Sipchem and International Diol Company shall not bear any liability whatsoever for any loss or damage incurred in connection with the use of this substance.