

# Tetrahydrofuran

## SECTION 1. IDENTIFICATION

<b>Product Identifier</b>	Tetrahydrofuran
<b>Other Means of Identification</b>	1,4-Epoxybutane, Butylene Oxide
<b>Product Code(s)</b>	TE1010, TE1020, TE1050
<b>Product Family</b>	Organic
<b>Recommended Use</b>	Laboratory and industrial use.
<b>Restrictions on Use</b>	None known.
<b>Supplier Identifier</b>	Alphachem Limited, 2485 Milltower Court, Mississauga, Ontario, L5N 5Z6, (905) 821-2995
<b>Emergency Phone No.</b>	CANUTEC CANADA, 613-996-6666, 24 Hours CHEMTREC, 800-424-9300, 24 Hours
<b>SDS No.</b>	0074

## SECTION 2. HAZARD IDENTIFICATION

Classified according to Canada's Hazardous Products Regulations (WHMIS 2015).

### Classification

Flammable liquid - Category 2; Acute toxicity (Oral) - Category 5; Skin irritation - Category 3; Eye irritation - Category 2A; Carcinogenicity - Category 2

### Label Elements



Signal Word:  
Danger

### Hazard Statement(s):

Highly flammable liquid and vapour.  
May be harmful if swallowed.  
Causes mild skin irritation.  
Causes serious eye irritation.  
May cause respiratory irritation.  
Suspected of causing cancer.

### Precautionary Statement(s):

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.  
Avoid breathing dust/fume/gas/mist/vapours/spray.  
Wear personal protective equipment/face protection.  
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.  
Continue rinsing.

### Other Hazards

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May form explosive peroxides.

### SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance:

Chemical Name	CAS No.	%	Other Identifiers
Tetrahydrofuran	109-99-9	> 99	1,4-Epoxybutane, Butylene Oxide

### SECTION 4. FIRST-AID MEASURES

#### First-aid Measures

##### Inhalation

Move to fresh air. Keep at rest in a position comfortable for breathing. If breathing is difficult, trained personnel should administer emergency oxygen if advised to do so by Poison Centre or doctor.

##### Skin Contact

Immediately rinse with lukewarm, gently flowing water for 15-20 minutes. Thoroughly clean clothing, shoes and leather goods before reuse or dispose of safely. Immediately call a Poison Centre or doctor.

##### Eye Contact

Immediately rinse the contaminated eye(s) with lukewarm, gently flowing water for 15-20 minutes, while holding the eyelid(s) open. Take care not to rinse contaminated water into the unaffected eye or onto the face.

##### Ingestion

Never give anything by mouth if person is rapidly losing consciousness, or is unconscious or convulsing. Do not induce vomiting. If breathing is difficult, trained personnel should administer emergency oxygen if advised to do so by the Poison Centre or doctor.

##### First-aid Comments

Get medical advice or attention if you feel unwell or are concerned.

#### Most Important Symptoms and Effects, Acute and Delayed

If on skin: repeated or prolonged exposure can irritate the skin. Symptoms include pain, redness, and swelling. If inhaled: can cause severe lung injury. If in eyes: may cause serious eye damage. May irritate or burn the eyes. Permanent damage including blindness may result.

#### Immediate Medical Attention and Special Treatment

##### Special Instructions

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

### SECTION 5. FIRE-FIGHTING MEASURES

#### Extinguishing Media

##### Suitable Extinguishing Media

Carbon dioxide, dry chemical powder or appropriate foam.

##### Unsuitable Extinguishing Media

Water is not effective for extinguishing a fire. It may not cool product below its flash point.

#### Specific Hazards Arising from the Product

Extremely flammable liquid and vapour. Can ignite at room temperature. Releases vapour that can form explosive mixture with air. Can accumulate static charge by flow, splashing or agitation. May accumulate in hazardous amounts in low-lying areas especially inside confined spaces, resulting in a fire hazard. May travel a considerable distance to a source of ignition and flash back to a leak or open container.

In a fire, the following hazardous materials may be generated: very toxic carbon monoxide, carbon dioxide.

#### Special Protective Equipment and Precautions for Fire-fighters

Evacuate area. Fight fire from a protected, explosion-resistant location or maximum distance possible. Use water spray to flush spills away from ignition sources. Use water spray to dilute spills to non-flammable mixtures. For a

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massive fire, immediately evacuate the area and use unmanned hose holder or monitor nozzles. Use water spray to flush spills away from ignition sources.

Fire-fighters may enter the area if positive pressure SCBA and full Bunker Gear is worn. Chemical protective clothing (e.g. chemical splash suit) and positive pressure SCBA may be necessary.

## SECTION 6. ACCIDENTAL RELEASE MEASURES

### Personal Precautions, Protective Equipment, and Emergency Procedures

Emergency responders: get expert advice. Evacuate the area immediately. Isolate the hazard area. Keep out unnecessary and unprotected personnel. Evacuate downwind locations. Increase ventilation to area or move leaking container to a well-ventilated and secure area. Eliminate all ignition sources. Use grounded, explosion-proof equipment.

### Environmental Precautions

If the spill is inside a building, prevent product from entering drains, ventilation systems and confined areas. Do not allow into any sewer, on the ground or into any waterway.

### Methods and Materials for Containment and Cleaning Up

Small spills or leaks: stop or reduce leak if safe to do so. Contain and soak up spill with absorbent that does not react with spilled product. Place used absorbent into suitable, covered, labelled containers for disposal. Flush spill area.

Large spills or leaks: contact emergency services and manufacturer/supplier for advice.

## SECTION 7. HANDLING AND STORAGE

### Precautions for Safe Handling

Wear personal protective equipment to avoid direct contact with this chemical. Do not get in eyes, on skin or on clothing. Only use where there is adequate ventilation. Immediately report leaks, spills or failures of the safety equipment (e.g. ventilation system). Avoid generating vapours or mists. Eliminate heat and ignition sources such as sparks, open flames, hot surfaces and static discharge. Post "No Smoking" signs. Prevent accidental contact with incompatible chemicals.

### Conditions for Safe Storage

Store in an area that is: cool, dry, well-ventilated, out of direct sunlight and away from heat and ignition sources, separate from incompatible materials (see Section 10: Stability and Reactivity). Electrically bond and ground containers. Ground clips must contact bare metal.

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Control Parameters

Chemical Name	ACGIH TLV®		OSHA PEL		AIHA WEEL	
	TWA	STEL	TWA	Ceiling	8-hr TWA	TWA
Tetrahydrofuran	50 ppm A3	100 ppm A3	200 ppm			

ACGIH® = American Conference of Governmental Industrial Hygienists.

TLV® = Threshold Limit Value.

TWA = Time-Weighted Average. A3 = Animal carcinogen.

STEL = Short-term Exposure Limit. C = Ceiling limit.

OSHA = US Occupational Safety and Health Administration. PEL = Permissible Exposure Limits.

### Appropriate Engineering Controls

Use local exhaust ventilation and enclosure, if necessary, to control amount in the air. Use non-sparking ventilation systems, approved explosion-proof equipment and intrinsically safe electrical systems in areas where this product is used and stored. Exhaust directly to the outside, taking any necessary precautions for environmental protection.

### Individual Protection Measures

#### Eye/Face Protection

Wear chemical safety goggles and face shield when contact is possible.

#### Skin Protection

Wear chemical protective clothing e.g. gloves, aprons, boots.

Suitable materials are: Barrier® (PE/PA/PE), Silver Shield/4H® (PE/EVAL/PE), Trelchem® HPS, Trelchem® VPS, Tychem® BR/LV, Tychem® Responder.

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The following materials should NOT be used: butyl rubber, natural rubber, neoprene rubber, nitrile rubber, polyvinyl chloride, Viton®, Viton®/butyl rubber.

#### **Respiratory Protection**

Wear a NIOSH approved air-purifying respirator with an organic vapour cartridge, wear a powered air-purifying respirator with an appropriate cartridge.

## **SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

### **Basic Physical and Chemical Properties**

<b>Appearance</b>	Clear colourless liquid.
<b>Odour</b>	Ethereal
<b>Odour Threshold</b>	2.5 - 3.5 ppm (recognition)
<b>pH</b>	Not available
<b>Melting Point/Freezing Point</b>	-108 °C (-162 °F) (melting); -108 °C (-162 °F) (freezing)
<b>Initial Boiling Point/Range</b>	66 °C (151 °F)
<b>Flash Point</b>	-17 °C (1 °F) (closed cup)
<b>Evaporation Rate</b>	8 (n-butyl acetate = 1)
<b>Flammability (solid, gas)</b>	Not available
<b>Upper/Lower Flammability or Explosive Limit</b>	11.8% (upper); 1.8% (lower)
<b>Vapour Pressure</b>	17.5 kPa at 20 °C
<b>Vapour Density (air = 1)</b>	2.49
<b>Relative Density (water = 1)</b>	0.8892 at 20 °C
<b>Solubility</b>	Very soluble in water; Soluble in all proportions in alcohols (e.g. ethanol).
<b>Partition Coefficient, n-Octanol/Water (Log Kow)</b>	0.46
<b>Auto-ignition Temperature</b>	321 °C (610 °F)
<b>Decomposition Temperature</b>	Not available
<b>Viscosity</b>	Not available (kinematic); Not available (dynamic)
<b>Other Information</b>	
<b>Physical State</b>	Liquid

## **SECTION 10. STABILITY AND REACTIVITY**

### **Reactivity**

Not reactive under normal conditions of use.

### **Chemical Stability**

Stable if inhibited.

### **Possibility of Hazardous Reactions**

Reacts in the presence of air, friction, heat, light, inhibitor depletion.

### **Conditions to Avoid**

Open flames, sparks, static discharge, heat and other ignition sources. Light.

### **Incompatible Materials**

Strong oxidizing agents (e.g. perchloric acid), strong bases (e.g. sodium hydroxide).

### **Hazardous Decomposition Products**

Shock-sensitive peroxides.

## **SECTION 11. TOXICOLOGICAL INFORMATION**

### **Likely Routes of Exposure**

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Inhalation; skin contact; eye contact; ingestion.

#### Acute Toxicity

Chemical Name	LC50	LD50 (oral)	LD50 (dermal)
Tetrahydrofuran	18,000 mg/L (rat) (4-hour exposure)	1650 mg/kg (rat)	> 2000 mg/kg (rat)

#### Skin Corrosion/Irritation

Human experience shows mild irritation.

#### Serious Eye Damage/Irritation

May cause serious eye irritation based on information for closely related materials.

#### STOT (Specific Target Organ Toxicity) - Single Exposure

##### Inhalation

Causes depression of the central nervous system.

##### Skin Absorption

No information was located.

##### Ingestion

Harmful severe irritation or burns to the mouth, throat and stomach. Symptoms may include nausea, vomiting, stomach cramps and diarrhea.

#### Aspiration Hazard

No information was located.

#### STOT (Specific Target Organ Toxicity) - Repeated Exposure

No information was located.

#### Respiratory and/or Skin Sensitization

Not known to be a respiratory sensitizer. Not known to be a skin sensitizer.

#### Carcinogenicity

Chemical Name	IARC	ACGIH®	NTP	OSHA
Tetrahydrofuran	Not Listed	A3	Not Listed	Not Listed

#### Key to Abbreviations

IARC = International Agency for Research on Cancer.

ACGIH® = American Conference of Governmental Industrial Hygienists.

A3 = Animal carcinogen.

NTP = National Toxicology Program.

OSHA = US Occupational Safety and Health Administration.

#### Reproductive Toxicity

##### Development of Offspring

Not known to harm the unborn child.

##### Sexual Function and Fertility

No information was located.

##### Effects on or via Lactation

No information was located.

#### Germ Cell Mutagenicity

Not known to be a mutagen.

#### Interactive Effects

No information was located.

## SECTION 12. ECOLOGICAL INFORMATION

This section is not required by WHMIS. This section is not required by OSHA HCS 2012.

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## SECTION 13. DISPOSAL CONSIDERATIONS

### Disposal Methods

Contact local environmental authorities for approved disposal or recycling methods in your jurisdiction. This product and its container must be disposed of as hazardous waste. Do NOT dump into any sewers, on the ground or into any body of water. Burn in an approved incinerator according to federal, provincial/state, and local regulations.

## SECTION 14. TRANSPORT INFORMATION

Regulation	UN No.	Proper Shipping Name	Transport Hazard Class(es)	Packing Group
Canadian TDG	UN2056	Tetrahydrofuran	3	II
US DOT	UN2056	Tetrahydrofuran	3	II

**Environmental Hazards** Not applicable

**Special Precautions** Not applicable

**Transport in Bulk According to Annex II of MARPOL 73/78 and the IBC Code**

Not applicable

## SECTION 15. REGULATORY INFORMATION

### Safety, Health and Environmental Regulations

#### Canada

**Domestic Substances List (DSL) / Non-Domestic Substances List (NDSL)**

Listed on the DSL.

#### USA

**Toxic Substances Control Act (TSCA) Section 8(b)**

Listed on the TSCA Inventory.

## SECTION 16. OTHER INFORMATION

**NFPA Rating** Health - 2 Flammability - 3 Instability - 1

**SDS Prepared By** Alphachem Limited

**Phone No.** (905)-821-2995

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**Date of Last Revision** January 23, 2017

**Disclaimer** This document is offered only as a guide in the safe handling of the above product, and has been prepared from the best information currently available. It is not intended to be all-inclusive and the conditions of use may involve other additional considerations. Since Alphachem Limited cannot anticipate or control the conditions under which the product may be used, it will not be liable for any claims, damages or losses which may result from the use or reliance on any information herein.

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