

Tetrahydrofuran, HPLC

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Tetrahydrofuran, HPLC

Synonyms/Generic Names: THF; Diethylene oxide; Tetramethylene oxide; 1,4-Epoxybutane
Butylene oxide; Cyclotetramethylene oxide; Furanidine; Hydrofuran; Oxacyclopentane

Product Number: 5787

Product Use: Industrial, Manufacturing or Laboratory use

Manufacturer: Columbus Chemical Industries, Inc.
N4335 Temkin Rd.
Columbus, WI. 53925

For More Information: 920-623-2140 (Monday-Friday 8:00-4:30)
www.columbuschemical.com

In Case of Emergency Call: CHEMTREC - 800-424-9300 or 703-527-3887 (24 Hours/Day, 7 Days/Week)

2. HAZARDS IDENTIFICATION

Target Organs: Central nervous system, Liver, Kidney

Other Hazards: May form explosive peroxides.

Signal Word: Danger

Pictograms:



GHS Classification:

Flammable liquids	Category 2
Eye irritation	Category 2A
Carcinogenicity	Category 2
Specific target organ toxicity - single exposure (respiratory system)	Category 3

GHS Label Elements, including precautionary statements:

Hazard Statements:

H225	Highly flammable liquid and vapor.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H351	Suspected of causing cancer.

Precautionary Statements:

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P233	Keep container tightly closed.
P240	Ground/Bond container and receiving equipment.
P241	Use explosion-proof electrical/ventilating/lighting/equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
P264	Wash hands thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313	IF exposed or concerned: Get medical advice/attention.
P337+P313	If eye irritation persists: Get medical advice/attention.
P370+P378	In case of fire: Use appropriate media to extinguish.
P403+P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/container in accordance with local regulations.

Potential Health Effects

Eyes	Causes serious eye irritation.
Inhalation	Harmful if inhaled. Causes respiratory tract irritation.
Skin	May be harmful if absorbed through skin. May cause skin irritation.
Ingestion	May be harmful if swallowed.

NFPA Ratings

Health	2
Flammability	3
Reactivity	2
Specific hazard	Not Available

HMIS Ratings

Health	2
Fire	3
Reactivity	2

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	Weight %	CAS #	EINECS# / ELINCS#	Formula	Molecular Weight
Tetrahydrofuran	>99	109-99-9	209-726-8	C ₄ H ₈ O	72.11 g/mol

4. FIRST-AID MEASURES

Eyes	Rinse with plenty of water for at least 15 minutes and seek medical attention.
Inhalation	Move casualty to fresh air and keep at rest. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.
Skin	Flush with plenty of water for at least 15 minutes while removing contaminated clothing and wash using soap. Get medical attention.
Ingestion	Do Not Induce Vomiting! Never give anything by mouth to an unconscious person. If conscious, wash out mouth with water. Get medical attention.

5. FIRE-FIGHTING MEASURES

Suitable (and unsuitable) extinguishing media	Flammable in the presence of a source of ignition when the temperature is above the flash point. Keep away from heat/sparks/open flame/hot surface. No smoking. Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Use appropriate media for adjacent fire. Cool unopened containers with water.
Special protective equipment and precautions for firefighters	Wear self-contained, approved breathing apparatus and full protective clothing, including eye protection and boots.
Specific hazards arising from the chemical	Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas. Emits toxic fumes (carbon oxides) under fire conditions. (See also Stability and Reactivity section).

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	See section 8 for recommendations on the use of personal protective equipment.
Environmental precautions	Prevent spillage from entering drains. Any release to the environment may be subject to federal/national or local reporting requirements.
Methods and materials for containment and cleaning up	Absorb spill with noncombustible absorbent material. Collect with an electrically protected vacuum cleaner or by wet-brushing then place in a suitable container for disposal. Clean surfaces thoroughly with water to remove residual contamination. Dispose of all waste and cleanup materials in accordance with regulations.

7. HANDLING AND STORAGE

Precautions for safe handling

See section 8 for recommendations on the use of personal protective equipment. Use with adequate ventilation. Wash thoroughly after using. Keep container closed when not in use. Avoid formation of aerosols. Use explosion-proof equipment. Keep away from sources of ignition - No smoking. Take measures to prevent the buildup of electrostatic charge.

Conditions for safe storage, including any incompatibilities

Store in cool, dry well ventilated area. Keep away from incompatible materials (see section 10 for incompatibilities).

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational exposure controls: Ventilation and appropriate grounding of containers.

Component	Exposure Limits	Basis	Entity
Tetrahydrofuran	50 ppm 147 mg/m ³	TLV	ACGIH
	100 ppm 295 mg/m ³	STEL	ACGIH
	200 ppm 590 mg/m ³	PEL	OSHA
	200 ppm	REL	NIOSH

	590 mg/m ³		
	250 ppm	STEL	NIOSH
	735 mg/m ³		

TWA: Time Weighted Average over 8 hours of work.

TLV: Threshold Limit Value over 8 hours of work.

REL: Recommended Exposure Limit

PEL: Permissible Exposure Limit

STEL: Short Term Exposure Limit during x minutes.

IDLH: Immediately Dangerous to Life or Health

WEEL: Workplace Environmental Exposure Levels

CEIL: Ceiling

Personal Protection

Eyes	Wear chemical safety glasses or goggles, and face shield.
Inhalation	Provide local exhaust, preferably mechanical. If exposure levels are excessive, use an approved respirator.
Skin	Wear nitrile or rubber gloves, and full body covering. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
Other	Not Available

Other Recommendations

Provide eyewash stations, quick-drench showers and washing facilities accessible to areas of use and handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance (physical state, color, etc.)	Clear, colorless liquid.
Odor	Fruity, ethereal.
Odor threshold	20-50 ppm
pH	Not Available
Melting point/freezing point	-108.3°C (-162.9°F)
Initial boiling point and boiling range	65 - 67°C (149.0 - 152.6°F)
Flash point	Closed Cup: -17°C (1.4°F) Open Cup: -20°C (-4°F)
Evaporation rate	8 (butyl acetate = 1)
Flammability (solid, gas)	Flammable
Upper/lower flammability or explosive limit	Lower: 1.8% Upper: 11.8%
Vapor pressure	152.0 hPa (114 mmHg) at 15°C (59°F) 190.7 hPa (143 mmHg) at 20°C (68°F) 213.3 hPa (160 mmHg) at 25°C (77°F) 373.3 hPa (280 mmHg) at 38°C (100.4°F)
Vapor density	2.5 (Air = 1)
Specific gravity	0.8800
Solubility (ies)	Easily soluble in diethyl ether, acetone. Partially soluble in cold water. Solubility in water is 30%. Miscible with alcohols, ketones, esters, hydrocarbons, and ethers. Very soluble in benzene, ethanol, and chloroform.
Partition coefficient: n-octanol/water	log Pow: < 1
Auto-ignition temperature	321°C (609.8°F)
Decomposition temperature	Not Available

10. STABILITY AND REACTIVITY

Chemical Stability	Stable
Possibility of Hazardous Reactions	Vapors may form explosive mixture with air.
Conditions to Avoid	Heat, flames and sparks. Extremes of temperature and direct sunlight.
Incompatible Materials	Oxidizing agents, oxygen.
Hazardous Decomposition Products	Carbon oxides.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Tetrahydrofuran

Skin	LD50 Dermal - rat - > 2,000 mg/kg
Eyes	Not Available
Respiratory	LC50 Inhalation - rat - 4 h - 54 mg/l
Ingestion	LD50 Oral - rat - 2,050 - 2,850 mg/kg

Carcinogenicity

IARC	No components of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH	No components of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP	No components of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA	No components of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Signs & Symptoms of Exposure

Skin	Irritation, redness, itchiness.
Eyes	Irritation, redness, watering eyes, itchiness.
Respiratory	Irritation, coughing, wheezing, chest pain.
Ingestion	Irritation, nausea, vomiting, diarrhea.

Chronic Toxicity	May cause damage to the following organs: blood, kidneys, lungs, liver, upper respiratory tract, skin, eyes, central nervous system (CNS). Suspected human carcinogen.
Teratogenicity	Not Available
Mutagenicity	Not Available
Embryotoxicity	Not Available
Specific Target Organ Toxicity	Inhalation - May cause respiratory irritation.
Reproductive Toxicity	Not Available
Respiratory/Skin Sensitization	Not Available

12. ECOLOGICAL INFORMATION

Ecotoxicity

Tetrahydrofuran

Aquatic Vertebrate	LC50 - Pimephales promelas (fathead minnow) - 2,160 mg/l - 96 h
Aquatic Invertebrate	EC50 - Daphnia magna (Water flea) - 382 mg/l - 24 h

Terrestrial	Growth inhibition NOEC - Algae - 3,700 mg/l - 192 h
Persistence and Degradability	Not Available
Bioaccumulative Potential	Not Available
Mobility in Soil	Not Available
PBT and vPvB Assessment	Not Available
Other Adverse Effects	Not Available

13. DISPOSAL CONSIDERATIONS

Waste Product or Residues	Users should review their operations in terms of the applicable federal/national or local regulations and consult with appropriate regulatory agencies if necessary before disposing of waste product or residue.
Product Containers	Users should review their operations in terms of the applicable federal/national or local regulations and consult with appropriate regulatory agencies if necessary before disposing of waste product container.

The information offered in section 13 is for the product as shipped. Use and/or alterations to the product may significantly change the characteristics of the material and alter the waste classification and proper disposal methods.

14. TRANSPORTATION INFORMATION

US DOT	UN2056, Tetrahydrofuran, 3, pg II
TDG	UN2056, TETRAHYDROFURAN, 3, pg II
IMDG	UN2056, TETRAHYDROFURAN, 3, pg II
Marine Pollutant	No
IATA/ICAO	UN2056, Tetrahydrofuran, 3, pg II

15. REGULATORY INFORMATION

TSCA Inventory Status	All ingredients are listed on the TSCA Active inventory.
DSL / NDSL	All ingredients are listed on the DSL inventory.
California Proposition 65	Not Listed
Rhode Island: Hazardous Substance List	Listed: Tetrahydrofuran
Massachusetts: Toxic or Hazardous Substance List, Right to Know	Listed: Tetrahydrofuran
Pennsylvania: Hazardous Substance List	Listed: Tetrahydrofuran
New Jersey: Right to Know Hazardous Substance List	Listed: Tetrahydrofuran
SARA 302	Not Listed
SARA 304	Not Listed
SARA 311	Fire Hazard, Acute Health Hazard, Chronic Health Hazard.
SARA 312	Fire Hazard, Acute Health Hazard, Chronic Health Hazard.
SARA 313	Not Listed
WHMIS Canada	Class B2: Flammable and combustible material – Flammable liquid. Class D2A: Poisonous and infectious material – Other effects – Very toxic.

	Class D2B: Poisonous and infectious material – Other effects – Toxic.
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16. OTHER INFORMATION

Revision	Date
Original	08/28/2012
Revision 1	12/09/2013
Revision 2	04/09/2014
Revision 3	03/02/2015
Revision 4	09/13/2021

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