

Section 1. Product and Company Identification

**Product Name** Tetrahydrofuran  
**CAS Number** 109-99-9

**Parchem - fine & specialty chemicals**  
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**New Rochelle, NY 10801**  
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Collect Calls Accepted

Section 2. Hazards Identification

**Classification of the substance or mixture**

**GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**

Flammable liquids (Category 2), H225  
Eye irritation (Category 2A), H319  
Carcinogenicity (Category 2), H351  
Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335

**GHS Label Elements**

**Pictograms:**



**Signal word:** DANGER

**Hazard and 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 skin 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): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position 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 dry sand, dry chemical or alcohol-resistant foam for extinction.
- P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
- P403 + P235 Store in a well-ventilated place. Keep cool.
- P405 Store locked up.
- P501 Dispose of contents/container to an approved waste disposal plant.

**Hazards not otherwise classified (HNOC) or not covered by GHS:** May form explosive peroxides.

Section 3. Composition / Information on Ingredients

**Common Name** Tetrahydrofuran  
**Synonym(s)** THF  
**Formula** C<sub>4</sub>H<sub>8</sub>O  
**CAS Number** 109-99-9

COMPONENT	CAS NUMBER	CONCENTRATION
Tetrahydrofuran	109-99-9	90 – 100%

Section 4. First Aid Measures

**Description of first-aid measures**

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

**Inhalation:** If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

**Skin contact:** Wash off with soap and plenty of water. Consult a physician.

**Eye contact:** Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

**Ingestion:** Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

**Most important symptoms and effects, both acute and delayed:** The most important known symptoms and effects are described in the labelling and/or in section 11

**Indication of any immediate medical attention and special treatment needed:** no data available

#### Section 5. Firefighting Measures

##### **Extinguishing media**

**Suitable extinguishing media:** Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

**Special hazards arising from the substance or mixture:** Carbon oxides

**Advice for firefighters:** Wear self-contained breathing apparatus for firefighting if necessary.

**Further information:** Use water spray to cool unopened containers.

#### Section 6. Accidental Release Measures

**Personal precautions, protective equipment, and emergency procedures:** Use personal protective equipment. Avoid breathing vapors, mist, or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.

For personal protection see section 8.

**Environmental precautions:** Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

**Methods and materials for containment and cleaning up:** Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

**Reference to other sections:** For disposal see section 13.

#### Section 7. Handling and Storage

**Precautions for safe handling:** Avoid contact with skin and eyes. Avoid inhalation of vapor or mist. 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:** Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Dry residue is explosive. Store under inert gas. Test for peroxide formation periodically and before distillation.

Section 8. Exposure Controls / Personal Protection

**Control parameters**

**Components with workplace control parameters**

Component	CAS-No.	Value	Control parameters	Basis
Tetrahydrofuran	109-99-9	TWA	50 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Central Nervous System impairment Upper Respiratory Tract irritation Kidney damage Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption		
		STEL	100 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Upper Respiratory Tract irritation Kidney damage Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption		
		TWA	200 ppm 590 mg/m <sup>3</sup>	USA. NIOSH Recommended Exposure Limits
		ST	250 ppm 735 mg/m <sup>3</sup>	USA. NIOSH Recommended Exposure Limits
		TWA	200 ppm 590 mg/m <sup>3</sup>	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m <sup>3</sup> is approximate.		
		STEL	250 ppm 735 mg/m <sup>3</sup>	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		TWA	200 ppm 590 mg/m <sup>3</sup>	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000

**Biological occupational exposure limits**

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Tetrahydrofuran	109-99-9	Tetrahydrofuran	2 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift (As soon as possible after exposure ceases)			

### Derived No Effect Level (DNEL)

Application Area	Exposure routes	Health effect	Value
Workers	Skin contact	Long-term systemic effects	25mg/kg BW/d
Consumers	Skin contact	Long-term systemic effects	15mg/kg BW/d
Workers	Inhalation	Long-term local effects	150 mg/m <sup>3</sup>
Workers	Inhalation	Long-term systemic effects	150 mg/m <sup>3</sup>
Consumers	Inhalation	Long-term systemic effects	62 mg/m <sup>3</sup>
Consumers	Inhalation	Acute local effects	150 mg/m <sup>3</sup>
Consumers	Inhalation	Acute systemic effects	150 mg/m <sup>3</sup>

### Predicted No Effect Concentration (PNEC)

Compartment	Value
Soil	2.13 mg/kg
Marine Water	0.432 mg/l
Fresh Water	4.32 mg/l
Marine Sediment	2.33 mg/kg
Fresh Water Sediment	2.33 mg/kg
Onsite Sewage Treatment Plant	4.6 mg/l

### Exposure controls

**Appropriate engineering controls:** Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

### Personal protective equipment

**Eye/face protection:** Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

**Skin protection:** Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

**Body Protection:** Complete suit protecting against chemicals, Flame retardant antistatic protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

**Respiratory protection:** Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multipurpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**Control of environmental exposure:** Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

Section 9. Physical and Chemical Properties

**Information on basic physical and chemical properties**

**Appearance Form:** liquid, clear

**Color:** colorless

**Odor:** no data available

**Odor Threshold:** no data available

**pH:** no data available

**Melting point/freezing point:** -108.0°C (-162.4°F)

**Initial boiling point and boiling range:** 65.0 - 67.0°C (149.0 - 152.6°F)

**Flash point:** -17.0°C (1.4°F) - closed cup

**Evaporation rate:** no data available

**Flammability (solid, gas):** no data available

**Upper/lower flammability or explosive limits**

Upper explosion limit: 11.8% (V)

Lower explosion limit: 1.8% (V)

**Vapor pressure:** 152.0 hPa (114.0 mmHg) at 15.0°C (59.0°F)

190.7 hPa (143.0 mmHg) at 20.0°C (68.0°F)

213.3 hPa (160.0 mmHg) at 25.0°C (77.0°F)

373.3 hPa (280.0 mmHg) at 38.0°C (100.4°F)

**Vapor density:** no data available

**Relative density:** 0.89 g/cm<sup>3</sup>

**Water solubility:** soluble

**Partition coefficient: noctanol/water:** log Pow: < 1

**Auto-ignition temperature:** 321.0°C (609.8 F)

**Decomposition temperature:** no data available

**Viscosity:** 0.512 mm<sup>2</sup>/s at 25°C (77°F) - 0.403 mm<sup>2</sup>/s at 50°C (122°F) -

**Explosive properties:** no data available

**Oxidizing properties:** no data available

**Other safety information:** no data available

Section 10. Stability and Reactivity

**Reactivity:** no data available

**Chemical stability:** Stable under recommended storage conditions. Test for peroxide formation before distillation or evaporation. Test for peroxide formation or discard after 1 year.

**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:** Other decomposition products - no data available. In the event of fire: see section 5

Section 11. Toxicological Information

**Information on toxicological effects**

**Acute toxicity**

LD50 Oral - rat - 2,050 - 2,850 mg/kg

LC50 Inhalation - rat - 4 h - 54 mg/l

LD50 Dermal - rat - > 2,000 mg/kg

no data available

**Skin corrosion/irritation**

Skin - rabbit

Result: Mild skin irritation

(Draize Test)

**Serious eye damage/eye irritation**

Eyes - rabbit

Result: Risk of serious damage to eyes.

(Draize Test)

**Respiratory or skin sensitization**

- guinea pig

Did not cause sensitization on laboratory animals.

**Germ cell mutagenicity:** In vivo tests did not show mutagenic effects

Ames test

S. typhimurium

Result: negative

**Carcinogenicity**

Suspected human carcinogens

**IARC:** No component of this product, present at levels greater than or equal to 0.1%, is identified as probable, possible or confirmed human carcinogen by IARC.

**NTP:** No component 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 component of this product, present at levels greater than or equal to 0.1%, is identified as a carcinogen or potential carcinogen by OSHA.

**Reproductive toxicity:** No toxicity to reproduction

**Specific target organ toxicity - single exposure:** May cause drowsiness or dizziness. -

Nervous system. May cause respiratory irritation.

**Specific target organ toxicity - repeated exposure:** The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

**Aspiration hazard:** No aspiration toxicity classification

**Additional Information:** RTECS: LU5950000

Central nervous system depression, Cough, chest pain, Difficulty in breathing, Exposure to high airborne concentrations can cause anesthetic effects., To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence



Section 12. Ecological Information

**Toxicity**

**Toxicity to fish:** LC50 - Pimephales promelas (fathead minnow) - 2,160 mg/l - 96 h

**Toxicity to daphnia and other aquatic invertebrates:** EC50 - Daphnia magna (Water flea)  
- 382 mg/l - 24 h

**Toxicity to algae:** Growth inhibition IC50 - Algae - 3,700 mg/l - 192 h

**Persistence and degradability**

**Biodegradability:** (OECD Test Guideline 301) Remarks: According to the results of tests of biodegradability this product is not readily biodegradable.

**Bioaccumulative potential:** No bioaccumulation is to be expected (log Pow <= 4).

**Mobility in soil:** no data available

**Results of PBT and vPvB assessment:** PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

**Other adverse effects:** no data available

Section 13. Disposal Considerations

**Waste Treatment Methods:** Dispose of product and contaminated packaging in accordance with all local, state, and federal environmental control regulations.

Section 14. Transport Information

**DOT (US)**

**UN number:** UN2056

**Class:** 3

**Packing group:** II

**Proper shipping name:** Tetrahydrofuran

**Reportable Quantity (RQ):** 1000 lbs

**Marine pollutant:** No

**Poison Inhalation Hazard:** No

**IMDG**

**UN number:** UN2056

**Class:** 3

**Packing group:** II

**EMS-No:** F-E, S-D

**Proper shipping name:** TETRAHYDROFURAN

**Marine pollutant:** No

**IATA**

**UN number:** UN2056





**Class:** 3  
**Packing group:** II  
**Proper shipping name:** Tetrahydrofuran

Section 15. Regulatory Information

**SARA 302 Components:** SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**SARA 313 Components:** SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**SARA 311/312 Hazards:** Fire Hazard, Acute Health Hazard, Chronic Health Hazard

**Massachusetts Right to Know Components**

Tetrahydrofuran	CAS-No.	Revision Date
	109-99-9	1993-04-24

**Pennsylvania Right to Know Components**

Tetrahydrofuran	CAS-No.	Revision Date
	109-99-9	1993-04-24

**New Jersey Right to Know Components**

Tetrahydrofuran	CAS-No.	Revision Date
	109-99-9	1993-04-24

**California Prop. 65 Components:** This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

**HMIS Rating**

**Health Hazard:** 2\*

**Flammability:** 3

**Physical Hazard:** 0

Section 16. Other Information

**Disclaimer:** The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product.

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