

Product Name	Tetrahydrofuran
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Section 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identification:

Product Description: Tetrahydrofuran

Synonyms: 1,4-Epoxybutane; THF

CAS-No: 109-99-9

EC-No.: 203-726-8

Molecular Formula: C₄H₈O (Hill)

REACH Registration No: A registration number is not available for this substance as the substance or its use are exempted from registration according to Article 2 REACH Regulation (EC) No 1907/2006, the annual tonnage does not require a registration, or the registration is envisaged for a later registration deadline.

1.2. Relevant identified uses of the substance or mixture and uses advised against:

Recommended Use: Laboratory chemicals, used as a pharma excipient

1.3. Details of the supplier of the safety data sheet:

- **Company** **Finar Limited**
184-186/P, Chacharwadi Vasna,
Sarkhej-Bavla Highway,
Ta.: Sanand, Dist.: Ahmedabad-382110, Gujarat, India.
Web: www.finarchemicals.com
- **E-Mail Address** safety.finar@actylis.com; info.finar@actylis.com

1.4. Emergency Telephone Number:

- For Emergency contact on: +91 - 2717 - 616 717

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SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture:

Classification according to Regulation (EC) No 1272/2008

Flammable liquid, Category 2, H225

Acute toxicity, Category 4, Oral, H302

Eye irritation, Category 2, H319

Carcinogenicity, Category, H351

Specific target organ toxicity- Single Exposure, Category 3, Respiratory System, H335

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2. Label Elements:

Labeling according Regulation (EC) No 1272/2008

Pictogram



Signal word: Danger

Hazard statement(s)

H225 Highly flammable liquid and vapour.

H302 Harmful if swallowed.

H319 Causes serious eye irritation.

H335 May cause respiratory irritation.

H351 Suspected of causing Cancer.

EUH019 May form explosive peroxides.

Precautionary statement(s)

Prevention

P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.

P240 Ground/bond container and receiving equipment.

Response

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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.

Storage

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

Reduced labelling (≤ 125 ml)

Pictogram



Signal word

Danger

Hazard statement(s)

H351 Suspected of causing Cancer.

Precautionary statement(s)

P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.

P308 + P313 IF exposed or concerned: Get medical advice / attention.

2.3. Other Hazards:

None Known

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances: Tetrahydrofuran

3.2. Mixtures:

Component	CAS-No	EC-No.	Weight %
Tetrahydrofuran	109-99-9	203-726-8	>95

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures:

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- **General advice**

If symptoms persist, call a physician.

- **If inhaled**

Fresh air. Immediately call in physician.

- **If Contact with skin**

Wash off immediately with plenty of water for at least 15 minutes. If skin irritation persists, call a physician.

- **In case of eye contact**

Rinse immediately with plenty of water, Call in ophthalmologist. Remove contact lenses.

- **If swallowed**

Immediately make victim drink water (two glasses at most). Consult a physician.

4.2. Most important symptoms and effects, both acute and delayed:

Irritant effects, Cough, Shortness of breath, narcosis, Somnolence.

4.3. Indication of any immediate medical attention and special treatment needed:

No information Available.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media:

Suitable Extinguishing Media- Use alcohol-resistant foam, dry chemical or carbon dioxide.

5.2. Special hazards arising from the substance or mixture:

Combustible.

Forms explosive mixtures with air at ambient temperatures.

Vapours are heavier than air and may spread along floors.

Pay attention to flashback.

Development of hazardous combustion gases or vapours possible in the event of fire.

5.3. Advice for firefighters:

Special protective equipment for fire-fighters

Stay in danger area only with self-contained breathing apparatus.

Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further Information:

Remove container from danger zone and cool with water. Prevent fire extinguishing water from contaminating surface water or the ground water system.

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SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures:

Advice for non-emergency personnel: Do not breathe vapours, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders: Protective equipment see section 8.

6.2. Environmental precautions:

Do not let product enter drains. Risk of explosion.

6.3. Methods and material for containment and cleaning up:

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material e.g. (Chemizorb®). Dispose of properly.

Clean up affected area.

6.4. Reference to other sections:

For disposal see Sections 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling:

Advice on safe handling

Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Take precautionary measures against static discharges.

Avoid ingestion and inhalation. If peroxide formation is suspected, do not open or move container. Keep away from open flames, hot surfaces and sources of ignition. Use only non-sparking tools. To avoid ignition of vapours by static electricity discharge, all metal parts of the equipment must be grounded. Take precautionary measures against static discharges.

Hygiene measures

Immediately change contaminated clothing. Apply preventive skin protection.

Wash hands and face after working with substance.

7.2. Conditions for safe storage, including any incompatibilities:

Storage conditions

May form explosive peroxides on prolonged storage. Containers should be dated when opened and tested periodically for the presence of peroxides. Should crystals form in a peroxidizable liquid, peroxidation may have occurred and the product should be considered extremely dangerous. In this instance, the container should only be opened remotely by professionals. Keep containers tightly closed in a dry, cool

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and well-ventilated place. Keep away from heat and sources of ignition, Flammables area.

Store under an inert atmosphere.

7.3. Specific end use(s):

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters:

Contains no substances with occupational exposure limit values.

8.2. Exposure Controls:

Appropriate Engineering Controls:

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

See section 7.1.

Personal Protective Equipment:

Protective clothing needs to be selected specifically for the workplace, depending on concentrations and quantities of the hazardous substances handled. The chemical resistance of the protective equipment should be enquired at the respective supplier.

- **Eye & Face Protection-**

Safety goggles

- **Hand Protection -**

Wear appropriate protective gloves and clothing to prevent skin exposure.

- **Other Protective equipment-**

Flame retardant antistatic protective clothing.

- **Respiratory Protection-**

Required when vapours/aerosols are generated.

Recommended Filter type: Filter A- (acc. to DIN 3181)

The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

- **Environmental Exposure Controls-**

Do not let product enter drains. Risk of explosion.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties:

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- **Appearance:** Colorless
- **Physical State:** Liquid
- **Odor:** ether-like / Petroleum distillates
- **Odor Threshold:** No data available
- **pH:** 7 to 8 at 20 °C aq solution
- **Melting Point:** -108 / -108.4 °C
- **Critical Temperature:** No data available
- **Vapor Pressure:** 173 hPa at 20 °C
- **Relative Vapor Density:** 2.5
- **Specific Gravity / Density:** 0.880
- **Auto-Ignition Temperature:** 215 °C
- **Minimum Ignition Energy:** No data available
- **Volatility:** No data available
- **Bulk Density:** No data available
- **Viscosity, dynamic:** 0.47 mPa.s at 20 °C
- **Water/Oil Dist. Co eff.:** No data available
- **Partition Co-efficient: n-octanol/Water:** No data available
- **Ionicity (in Water):** No data available
- **Lower Explosion Limit:** 1.5 / 2.0 % (V)
- **Upper Explosion Limit:** 11.8 % (V)
- **Boiling Point/Range:** 66°C
- **Flash Point:** -21°C
- **Water Solubility:** at 20°C Soluble
- **Molecular Weight:** 72.11 g/mol

9.2. Other information:

Molecular Formula: C₄ H₈ O

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity:

Vapors may form explosive mixture with air.

Formation of peroxides possible.

10.2. Chemical stability:

Sensitivity to light.

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Sensitive to air.

Risk of Explosion during distillation.

10.3. Possibility of hazardous reactions:

A risk of explosion and/or of toxic gas formation exists with the following substances: alkali hydroxides, hydrides, air, strong oxidizing agents, Potassium, thionyl chloride, aminophenol, with, peroxi compounds.

Generates dangerous gases or fumes in contact with: Bromine

Exothermic reaction with: halides, Acids, peroxi compounds, metallic chlorides

10.4. Conditions to avoid:

Warming.

10.5. Incompatible materials:

Rubber, various plastics, Tin

10.6. Hazardous decomposition products:

Peroxides

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects:

Acute Oral toxicity

LD50: 1650 mg/kg

(ECHA)

Symptoms: Irritation of mucous membrances

Acute Inhalation toxicity

Symptoms: mucosal irritations, Cough, Shortness of breath, Possible damages:., damage of respiratory tract

Acute Dermal toxicity

No Data Available

Skin corrosion/irritation

Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.

Serious eye damage/eye irritation

Rabbit

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Result: Eye irritation

(IUCLID)

Causes serious eye irritation

Respiratory or skin sensitization

Sensitisation Test: Guinea pig

Result: negative

(IUCLID)

Human Experience

Result: negative

(IUCLID)

Germ cell mutagenicity

Genotoxicity in vivo

Ames test

Result: negative

(IUCLID)

Carcinogenicity

No data available

Reproductive toxicity

No impairment of reproductive performance suspected. (Lit.)

Teratogenicity

No data available

CMR effects

Carcinogenicity: Suspected of causing cancer.

Specific target organ toxicity - single exposure

May Causes Respiratory Irritation: Target Organs: Respiratory system

Specific target organ toxicity - repeated exposure

No data available.

Aspiration hazard

No data available

11.2 Further Information:

In high doses: somnolence, narcosis

Other dangerous properties can not be excluded. This substance should be handled with particular care.

SECTION 12: ECOLOGICAL INFORMATION

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12.1. Toxicity:**Toxicity to fish**

Flow-through test LC50 Pimephales promelas (fathead minnow): 2,160 mg/l; 96 h

OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates

Static test EC50 Daphnia magna (Water flea): 3,485 mg/l; 48 h

OECD Test Guideline 202

Toxicity to algae

Cell multiplication inhibition test IC5 Scenedesmus quadricauda (Green algae): 3,700 mg/l; 8 d
(maximum permissible toxic concentration)

Toxicity to bacteria

Static test IC50 activated sludge: 460 mg/l; 3 h

OECD Test Guideline 209

Toxicity to fish (Chronic toxicity)

Flow-through test NOEC Pimephales promelas (fathead minnow): 216 mg/l; 33 d

Analytical monitoring: yes

(ECHA)

12.2 Persistence and degradability:

Biodegradability

39 %; 28 d; aerobic Biochemical oxygen demand

OECD Test Guideline 301 D

Not Readily biodegradable

12.3 Bioaccumulate potential:

Partition Coefficient: - n-Octanol/water

Log Pow: 0.45 (25°C)

OECD Test Guideline 107

Bioaccumulation is not expected.

12.4 Mobility in soil:

No data available

12.5 Results of PBT and vPvB assessment

Substances does not meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII.

12.6 Other adverse effects:

Discharge into the environment must be avoided.

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SECTION 13: Disposal considerations

13.1 Waste treatment methods:

Waste material must be disposed of in accordance with the national and local regulations.

Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 14: Transport information

	Land transport (ADR/RID)	Air transport (IATA)	Sea transport (IMDG)
14.1 UN number	UN 2056		
14.2 Proper shipping name	TETRAHYDROFURAN		
14.3 Class	3		
14.4 Packing group	II		
14.5 Environmentally hazardous	--	--	--
14.6 Special precautions for user	Yes Tunnel Restriction code – D/E	No	Yes Ems F-E S-D
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not Relevant		

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture:

National Legislation

Storage class 3

15.2 Chemical safety assessment:

For this product a chemical safety assessment was not carried out.

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SECTION 16: Other information

Full text of H-Statements referred to under sections 2 and 3.

H225	Highly flammable liquid and vapour.
H302	Harmful if swallowed.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H351	Suspected of causing cancer.

Training advice

Provide adequate information, instruction and training for operators.

References: Not available

Created: 30/07/2021

Updated On: 30/09/2023

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