



## SAFETY DATA SHEET

### TETRAHYDROFURAN

#### 1.IDENTIFICATION OF THE SUBSTANCE OR MIXTURE AND OF THE SUPPLIER

Product name:	TETRAHYDROFURAN
Recommended use:	Chemical for industrial
Manufacturer/Supplier:	<b>MODERN CHEMICAL CO.,LTD.</b> 82/80 Soi Ekamai 22 (Nuannoi), Sukhumvit 63, Klong Tan Nuea, Watthana, Bangkok 10110
Telephone No:	0-2715-0897-9, 0-2392-3410-3
Fax No:	0-2715-0908-9, 0-2391-1571-2
Emergency Telephone No:	0-2715-0897-9, 0-2392-3410-3

#### 2. HAZARDS IDENTIFICATION

##### Label elements

##### Pictogram



##### Signal word

Danger

##### Hazard statement(s)

- 1.) Highly flammable liquid and vapour.
- 2.) Causes skin irritation.
- 3.) May be fatal if swallowed and enters airways.
- 4.) May cause drowsiness or dizziness.
- 5.) Toxic to aquatic life with long lasting effects.
- 6.) May damage the unborn child. Suspected of damaging fertility.

##### Precautionary statement(s)

- 1.) Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
- 2.) Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.



- 3.) Avoid release to the environment.
- 4.) IF SWALLOWED: call a doctor/physician. Do NOT induce vomiting.
- 5.) IF IN EYES: Rinse cautiously with water for 15 minutes.
- 6.) IF ON SKIN Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

**Synonym:** Cyclotetramethylene oxide, Diethylene oxide, 1,4-Epoxybutane, Oxacyclopentane, Oxolane, Tetramethylene oxide.

Ingredients	% (w/w)	CAS NO.
TETRAHYDROFURAN	100	109-99-9

### 4. FIRST AID MEASURES

**General advice:**

Show this safety data sheet to the doctor in attendance.

**Inhalation:**

Move to fresh air in case of accidental inhalation of vapors. Keep patient warm. In case of shortness of breath, give oxygen. Apply artificial respiration only if patient is not breathing or under medical supervision. No artificial aspiration mouth to mouth or mouth to nose.

**Skin contact:**

Remove contaminated clothing and wash affected skin with soap and water. Obtain medical attention. If signs of poisoning appear, treat as for inhalation. Wash contaminated clothing before reuse. Contaminated combustible material, e.g. clothing ignites more readily and burns fiercely.

**Eye contact:**

If substance has got into the eyes, immediately wash out with plenty of water for at least 15 minutes. Obtain medical attention.

**Ingestion:**

Rinse mouth. **Do not induce vomiting.** Keep patient warm, In case of shortness of breath, give oxygen. Apply respiration only if patient is not breathing or under medical supervision. No artificial aspiration mouth to mouth or mouth to nose. Use suitable instruments/apparatus. Obtain medical attention. Never give anything by mouth to an unconscious person.

### 5. FIRE-FIGHTING MEASURES

**Suitable extinguishing media:**

Use water spray, alcohol – resistant foam, dry chemical or carbon dioxide.



### **Unsuitable Extinguishing Media:**

Do not use a solid water stream as it may scatter and spread fire.

### **Specific hazards arising from Chemicals:**

Vapors may form explosive mixture with air. Flash back possible over considerable distance.

### **Special protective equipment for fire-fighters:**

Weas self contained breathing apparatus for fighting if necessary.

## **6. ACCIDENTAL RELEASE MEASURES**

### **Precautions:**

Evacuate personnel to safe areas. Do not breathe vapors or spray mist.

Remove all sources of ignition. Wear a positive-pressure supplied-air respirator, flame retardant antistatic protective clothing. Shut off leaks if without risk. Keep people away from and upwind of spill/leak.

### **Environmental precautions:**

Contain or absorb leaking liquid with sand or earth, consults an expert.

Prevent liquid entering sewers, basements and workpits. If substance has entered a water course or sewer or contaminated soil or vegetation.

### **Methods and Material for Containment and Clean Up:**

Spillage: May react with combustible substances creating fire or explosion hazard and formation of toxic fumes. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Soak up with inert absorbent material (e.g. sand, silicagel). Prevent liquid entering sewers, basements and workpits; vapor may create explosive atmosphere.

Transfer to covered steel drums. Dispose promptly.

## **7. HANDLING AND STORAGE**

### **Precautions for Safe Handling & Product Transfer:**

Keep container tightly closed. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only in area provided with appropriate exhaust ventilation. Do not breathe vapors or spray mist.

Avoid contact with skin, eyes and clothing. Do not empty into drains.

### **Conditions for Safe Storage & Unsuitable Materials:**

Keep tightly closed at room temperature in a dry, cool and well ventilated place. Keep away from heat and sources of ignition. Keep out of direct sunlight and away from incompatible material. Store in original container. Electrical equipment should be protected to the appropriate standard.



## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Occupational Exposure Limits:** OEL 50 ppm (150 mg/m<sup>3</sup>), TWA 50 ppm (148 mg/m<sup>3</sup>), STEL 200 ppm (599 mg/m<sup>3</sup>)

**Appropriate Engineering Controls:** The product should only be used in areas from which all naked lights and other sources of ignition have been excluded. Ventilation hoods and fans required when working with organic solvents.

### Individual Protection Measures

**Respiratory protection:** In case of insufficient ventilation, wear suitable respiratory equipment required when vapor/aerosols are generated: Filter A (acc. To DIN 3181) for vapors of organic compounds.

**Hand protection:** Handle with gloves. In case full contact wear gloves from viton material, in splash contact wear gloves from nitrile rubber material. The select protective gloves have to satisfy the specifications of EU Directive 89/686 EEC and standard EN 374 derived from it.

**Eye protection:** Goggles giving complete protection to eyes.

**Skin and body protections:** Chemical resistant apron / flame retardant antistatic protective clothing, heavy duty work shoes.

**Hygiene measures:** Ventilation hoods and fans required when working with organic solvents or in hot melt applications. Keep working clothes separately. Keep away from food, drink and animal feeding stuffs.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Form, Color and Odor :</b> liquid, colorless, characteristic	<b>Evaporation rate :</b> 6.3 (n-Bu Acetate = 1)
<b>Melting Point :</b> -108.5 °C	<b>Specific gravity :</b> 0.886-0.888 g/cm <sup>3</sup> at 20/4 °C
<b>pH :</b> N/A	<b>Solubility in water :</b> Soluble at 20 °C
<b>Boiling point :</b> 66 °C	<b>Viscosity :</b> 0.48 mPa.s at 20 °C
<b>Vapour pressure :</b> 114 mbar at 15 °C	<b>Vapor Density :</b> 2.5 g/l
<b>Lower explosive limits:</b> 1.5 % Vol	<b>Upper explosive limits:</b> 12.4 % Vol
<b>Auto-ignition temperature :</b> 215 °C	<b>Flash point:</b> -21.5
<b>Odour threshold:</b> N/A	<b>Flammability (solid, gas):</b> N/A
<b>Decomposition temperature:</b> N/A	<b>Solubility in other solvents:</b> N/A
<b>n-octanol/water partition coefficient (log P<sub>ow</sub>):</b> 0.45	



## 10. STABILITY AND REACTIVITY

<b>Chemical Stability:</b>	Stable under recommended storage conditions.
<b>Reactions:</b>	Highly flammable. Light sensitive. Sensitive to air. Unsuitable working materials with various plastic, rubber, tin. Explosible with air in a vaporous/gaseous state.
<b>Possibility of Hazardous Reactions:</b>	no data available
<b>Conditions to avoid:</b>	Heating.
<b>Materials to avoid:</b>	Alkali hydroxides, hydrides, air, oxygen, oxidizing agent, bromine.
<b>Hazardous decomposition products:</b>	Peroxide, Carbon monoxides, Carbon dioxides . (Hazardous decomposition products from under fire condition)

## 11. TOXICOLOGICAL INFORMATION

<b>Acute toxicity:</b>	LD50 (oral, rat): 1650 mg/kg
<b>Sensitization:</b>	After inhalation: mucosal irritations, coughing, dyspnoea, headache. After skin contact: irritations. Danger of skin absorption. Degreasing effect on the skin, possibly followed by secondary inflammation. After eyes contact: irritations. After swallowing: Irritations of mucous membranes in the mouth, pharynx, oesophagus and gastrointestinal tract. After inhalation in high does: drowsiness, narcosis.
<b>Chronic toxicity:</b>	Experience in man; no sensitizing effect. The Sensitization test (guinea pig) is no sensitizing effect. Bacterial mutagenicity; Ames test is negative. No indication of mutagenic activity. No impairment of reproductive performance suspected.
<b>Further toxicological information:</b>	The product should be handled with the care usual when dealing with chemicals

## 12. ECOLOGICAL INFORMATION

### Toxicity

Toxicity to fish: LC50 - P.promelas – 2160 mg/l/96h (in soft water)

Toxicity to daphnia and other aquatic invertebrates:

EC50 - Daphnia magna -382mg/l/24h



Toxicity to Algal: IC5 - Sc.quadricauda - 3700 mg/l/8d

Toxicity to Bacterial: EC5 - Ps. Putida – 580 mg/l/16h

EC5 - M.aeruginosa : 225 mg/l/8d

**Biodegradability Remarks:** According to the results of tests of biodegradability this product is considered as being readily biodegradable.

**Bioaccumulative Potential:** No data available

**Mobility:** No data available

**Affected in any other way:** No data available

### 13. DISPOSAL CONSIDERATIONS

**Material Disposal:** There are no uniform EC Regulations for the disposal of chemicals or residues. Chemical residues generally count as special waste. The disposal of the latter is regulated in the EC member countries through corresponding law and regulations. We recommend that you contact either the authorities in charge or approved waste disposal companies which will advise you on how to dispose of special waste or burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Observe all federal, state, and local environmental regulations.

**Container Disposal:** Disposal in compliance with official regulations. Handle contaminated packaging as hazardous waste in the same way of the substance itself. If not officially specified differently, non-contaminated packaging may be treated like household waste or recycled.

### 14. TRANSPORT INFORMATION

#### ADR/ADNR

UN-No: 2056 Class: 3 Packing group: II

Proper shipping group: TETRAHYDROFURAN

#### IMGD

UN-No: 2056 Class: 3 Packing group: II

Marine pollutant: NO

Proper shipping group: TETRAHYDROFURAN EMS: F-E S-D



## IATA

UN-No: 2056

Class: 3

Packing group: II

Proper shipping group: TETRAHYDROFURAN

## 15. REGULATORY INFORMATION

### GHS-Labeling

#### Hazard statement (s):

H225: Highly flammable liquid and vapor.

H319: Causes serious eye irritation.

H335: May cause respiratory irritation.

EUH019: May form explosive peroxides.

#### Precautionary statement(s)

P210: Keep away from heat.

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 vapors.

P271: Use only outdoors or in a well-ventilated area.

P264: Wash hand thoroughly after handling.

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.

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

P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P337 + P313: If eye irritation persists: Get medical advice/attention.

P312: Call a POISON CENTER or doctor/physician if you feel unwell.

P370 + P378: In case of fire: Use carbon dioxide, dry chemical or 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.

**Hazard symbol(s)**

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**R - phrase(s):**

R11: Highly flammable.

R19: May form explosive peroxides.

R36/37: Irritating to eyes and respiratory system.

**S - phrase(s):**

S16 : Keep away from sources of ignition. - No smoking.

S29: Do not empty into drains.

S33 : Take precautionary measures against static discharges.

**16. Other Information**

Modern Chemical Co.,Ltd. provides the information contained herein in good faith but makes no representation as to its comprehensive or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose.

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