



Material Safety Data Sheet

LA2007
Tetrahydrofuran

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Id: LA2007
Product Name: Tetrahydrofuran
Synonyms: Tetramethylene Oxide ; THF
Chemical Family: Oxygen substituted cyclic hydrocarbons.
Application: Solvent.

Distributed By:
Univar Canada Ltd.
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Richmond, BC
V6X 1W5

Prepared By: The Environment, Health and Safety Department of Univar Canada Ltd.
Preparation date of MSDS: 07/Nov/2012
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2. COMPOSITION/INFORMATION ON INGREDIENTS

| Ingredients | Percentage (W/W) | LD50s and LC50s Route & Species: |
|-----------------------------|------------------|---|
| Tetrahydrofuran 109-99-9 | 100 | Oral LD50 Rat = 1650 mg/kg Inhalation LC50 Rat = 180 mg/L 1 h Inhalation LC50 Rat = 53.9 mg/L 4 h |

Note: No additional remark.

3. HAZARDS IDENTIFICATION

Potential Acute Health Effects:

Eye Contact: May cause severe eye irritation.

Skin Contact: May irritate skin. Repeated or prolonged contact may cause defatting and drying of skin which may result in skin irritation and dermatitis.

Inhalation: Inhalation may cause irritation of the respiratory passages, headache, weakness, temporary nervous system depression with anesthetic effects such as dizziness, headache, confusion, incoordination and loss of consciousness.

Ingestion: Not expected to be a hazard in normal industrial use.

4. FIRST AID MEASURES

Eye Contact: Flush eyes with gently flowing water for at least 15 minutes or until the chemical is removed, while holding the eyelid(s) open. Take care not to rinse the contaminated water into the unaffected eye or face. Seek immediate medical attention. If irritation persists or signs of toxicity occur, seek medical attention.

Skin Contact: Flush skin with large amounts of water. If irritation persists, get medical attention.

Inhalation: If symptoms are experienced, remove source of contamination or move victim to fresh air. If symptoms persist, get medical attention. If the affected person is not breathing, apply artificial respiration. If breathing is difficult, give oxygen. In situations where administering oxygen is appropriate, first aiders must be trained in the safe use and handling of oxygen. It is preferable to administer oxygen under a doctor's supervision or advice. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation (CPR) immediately. Immediate medical assistance is required.

Ingestion: Seek immediate medical attention. Do NOT induce vomiting. Never give anything by mouth to an unconscious or convulsing person. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs. Administer artificial respiration if breathing has stopped. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation (CPR) immediately.

Notes to Physician: Treatment based on sound judgment of physician and individual reactions of patient.

5. FIRE FIGHTING MEASURES

Flash Point: -17 °C / 1 °F

Flash Point Method: Closed cup.

Autoignition Temperature: 321°C /610°F

Flammable Limits in Air (%): Lower: 1.8% Upper: 11.8%

Extinguishing Media: Use DRY chemicals, CO₂, alcohol foam or water spray.

Special Exposure Hazards: Isolate and restrict area access. Stop leak only if safe to do so. Move containers from fire area if you can do it without risk. Fight fire from a safe distance and from a protected location. Use flooding quantities of water for fire and water spray or fog for vapors. Containers exposed to intense heat from fires should be cooled with water to prevent vapor pressure build-up which could result in container rupture. This material may produce a floating fire hazard in extreme fire conditions. This product can produce flammable vapors which may travel to a source of ignition and flash back. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. Always stay away from the end of tanks.

Hazardous Decomposition/Combustion Materials (under fire conditions): Irritating vapors. Carbon monoxide. Nitrogen oxides. Smoke. Partially oxidized hydrocarbon fragments.

Special Protective Equipment: Fire fighters should wear full protective clothing, including self-contained breathing equipment.

NFPA RATINGS FOR THIS PRODUCT ARE: HEALTH 2, FLAMMABILITY 3, INSTABILITY 1

HMIS RATINGS FOR THIS PRODUCT ARE: HEALTH 2, FLAMMABILITY 3, REACTIVITY 1

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures: Wear appropriate protective equipment.

Environmental Precautionary Measures: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. Consult local authorities.

Procedure for Clean Up: Isolate hazard area and restrict access. Stop leak only if safe to do so. Remove ignition sources and work with non-sparking tools. Small spills: soak up with absorbent material and scoop into containers. Large spills : prevent contamination of waterways. Dike and pump into suitable containers. Clean up residual with absorbent material, place in appropriate container and flush with water.

7. HANDLING AND STORAGE

Handling: For industrial use only. Handle and open containers with care. Avoid contact with eyes, skin and clothing. Do not ingest. Avoid inhalation of chemical. DO NOT handle or store near an open flame, heat, or other sources of ignition. Fixed equipment as well as transfer containers and equipment should be grounded to prevent accumulation of static charge. DO NOT pressurize, cut, heat, or weld containers. Empty containers may contain hazardous product residues. Keep the containers closed when not in use. Protect against physical damage. Use appropriate personnel protective equipment. Isolate, vent, drain, wash and purge systems or equipment before maintenance or repair. Check periodically to confirm inhibitor content. If below desired level, add extra inhibitor and mix well to be effective. Partially filled containers should be blanketed with nitrogen.

7. HANDLING AND STORAGE

Storage: Store in a cool, dry, well ventilated area, away from heat and ignition sources. Place away from incompatible materials. Keep containers tightly closed. Prevent electrostatic charge buildup by using common bonding and grounding techniques.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls:

Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines. Use explosion proof equipment.

Respiratory Protection: If exposure exceeds occupational exposure limits, use an appropriate NIOSH approved respirator. In case of spill or leak resulting in unknown concentration, use a NIOSH approved supplied air respirator.

Gloves:

Appropriate chemical resistant gloves should be worn.

Skin Protection: Skin contact should be prevented through the use of suitable protective clothing, gloves and footwear, selected for conditions of use and exposure potential. Consideration must be given both to durability as well as permeation resistance.

Eyes: Safety glasses with side shields or chemical goggles.

Other Personal Protection Data: Ensure that eyewash stations and safety showers are proximal to the work-station location.

| Ingredients | Exposure Limit - ACGIH | Exposure Limit - OSHA | Immediately Dangerous to Life or Health - IDLH |
|-----------------|--------------------------------|--|--|
| Tetrahydrofuran | 100 ppm STEL 50 ppm TLV-TWA | 200 ppm TWA 590 mg/m ³ TWA 250 ppm STEL 735 mg/m ³ STEL | 2000 ppm |

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid.

Color: Clear, colorless

Odor: Mild Ether.

pH Not Available.

Specific Gravity: 0.89 @ 20°C

Boiling Point: 66°C /151°F

Freezing/Melting Point: -108°C / -163°F

Vapor Pressure: >132 mmHg @ 20°C

Vapor Density: 2.5

% Volatile by Volume: Not Available.

Evaporation Rate: 8

Solubility: Soluble in water.

VOCs: Not Available.

Viscosity: 0.46 mPa.s @ 25 C

Molecular Weight: 72 g/mol

Other: Not Available.

10. STABILITY AND REACTIVITY

Chemical Stability: This product is stable with an appropriate level of Butylated Hydroxy Toluene inhibitor (minimum 200 ppm), but reactive (unstable) without.

Hazardous Polymerization: Will not occur.

Conditions to Avoid: Avoid excessive heat, open flames and all ignition sources.

Materials to Avoid: Strong oxidizing agents. Strong alkalis. Bromine.

Hazardous Decomposition Products: Irritating vapors. Peroxides.

Additional Information:

May form peroxides in the presence of air. May react with oxygen to form unstable peroxides. Peroxides are thermal unstable and shock sensitive.

11. TOXICOLOGICAL INFORMATION

Principle Routes of Exposure

Ingestion: Not expected to be a hazard in normal industrial use.

Skin Contact: May irritate skin. Repeated or prolonged contact may cause defatting and drying of skin which may result in skin irritation and dermatitis.

Inhalation: Inhalation may cause irritation of the respiratory passages, headache, weakness, temporary nervous system depression with anesthetic effects such as dizziness, headache, confusion, incoordination and loss of consciousness.

Eye Contact: May cause severe eye irritation.

Additional Information: Symptoms of respiratory tract irritation and damage to respiratory epithelium were reported in rats exposed to 5000 ppm of tetrahydrofuran for 90 days. Elevation of SGPT suggests a disturbance in liver function.

Acute Test of Product:

Acute Oral LD50: Not Available.

Acute Dermal LD50: Not Available.

Acute Inhalation LC50: Not Available.

Carcinogenicity:

| Ingredients | IARC - Carcinogens | ACGIH - Carcinogens |
|-----------------|--------------------|---------------------|
| Tetrahydrofuran | Not listed. | A3 |

Carcinogenicity Comment: No additional information available.

Reproductive Toxicity/ Teratogenicity/ Embryotoxicity/ Mutagenicity: Not Available.

12. ECOLOGICAL INFORMATION

Ecotoxicological Information:

| Ingredients | Ecotoxicity - Fish Species Data | Acute Crustaceans Toxicity: | Ecotoxicity - Freshwater Algae Data |
|-----------------|--|-----------------------------|-------------------------------------|
| Tetrahydrofuran | 1970 - 2360 mg/L LC50 (Pimephales promelas) 96 h flow-through 2700 - 3600 mg/L LC50 (Pimephales promelas) 96 h static | Not Available. | Not Available. |

Other Information:

No additional remark.

13. DISPOSAL CONSIDERATIONS

Disposal of Waste Method: Disposal of all wastes must be done in accordance with municipal, provincial and federal regulations.

Contaminated Packaging: Empty containers should be recycled or disposed of through an approved waste management facility.

14. TRANSPORT INFORMATION

DOT (U.S.):

DOT Shipping Name: TETRAHYDROFURAN

DOT Hazardous Class 3

DOT UN Number: UN2056

DOT Packing Group: II

DOT Reportable Quantity (lbs): Not Available.

Note: No additional remark.

Marine Pollutant: No.

14. TRANSPORT INFORMATION

TDG (Canada):

TDG Shipping Name: TETRAHYDROFURAN

Hazard Class: 3

UN Number: UN2056

Packing Group: II

Note: No additional remark.

Marine Pollutant: No.

15. REGULATORY INFORMATION

U.S. TSCA Inventory Status: All components of this product are either on the Toxic Substances Control Act (TSCA) Inventory List or exempt.

Canadian DSL Inventory Status: All components of this product are either on the Domestic Substances List (DSL), the Non-Domestic Substances List (NDSL) or exempt.

Note: Not available.

U.S. Regulatory Rules

| Ingredients | CERCLA/SARA - Section 302: | SARA (311, 312) Hazard Class: | CERCLA/SARA - Section 313: |
|-----------------|----------------------------|-------------------------------|----------------------------|
| Tetrahydrofuran | Not Listed. | Listed | Not Listed. |

California Proposition 65: Not Listed.

MA Right to Know List: Listed.

New Jersey Right-to-Know List: Listed.

Pennsylvania Right to Know List: Listed.

WHMIS Hazardous Class:

B2 FLAMMABLE LIQUIDS

D2B TOXIC MATERIALS



16. OTHER INFORMATION

Additional Information:

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

Disclaimer:

NOTICE TO READER:

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*****END OF MSDS*****