



## INTERNATIONAL DIOL COMPANY

### Safety Data Sheet

According to Regulation (EC) No. 1272/2008, Regulation (EC) 1907/2006

#### 1. Identification of the substance/mixture and of the responsible company

1.1. Product Identifier: Tetrahydrofuran (THF) CAS NO: 109-99-9

1,4-EPOXYBUTANE; TETRAMETHYLENE OXIDE; OXACYCLOPENTANE; CYCLOTETRAMETHYLENE OXIDE; BUTANE, ALPHA, DELTA-OXIDE; THF; FURANIDINE; OXOLANE; RCRA U213; UN 2056; C4H8O

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

Identified uses: solvent for resins, reactant in preparation of polytetrahydrofuran.

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

**International Diol Company**  
**PO Box 12021**  
**Jubail Industrial City - 31961**  
**Kingdom of Saudi Arabia**

Website: [www.sipchem.com/en/affiliates2.htm](http://www.sipchem.com/en/affiliates2.htm)

1.4. Emergency telephone number: 00966-359 9985 (24 hours)

#### 2. Hazards Identification

Tetrahydrofuran CAS 109-99-9 Purity: >99%

Trace Impurities Butyl Methyl Ether (BME)

2.1. Classification of the substance or mixture:

Classification of Labeling in accordance with the CLP Regulations:

Index No	International Chemical Identification	EC No	CAS No	Classification		Labeling			Specific Conc. Limits, M-factors	Notes
				Hazard Class and Category Code(s)	Hazard statement Code(s)	Pictogram Signal Word Code(s)	Hazard Statement Code(s)	Suppl. Hazard statement Code(s)		
603-025-00-0	tetrahydrofuran	203-726-8	109-99-9	Flam. Liq. 2 Eye Irrit. 2 STOT SE 3 Acute Tox.4 (oral) Carc. 2	H225 H319 H335 H302 H351	GHS02 GHS07  GHS08	F Xi; R:11-19-36/37	EUH019	>99	

**Classification according to Regulation 1272/2008/EC (CLP)**

**Basis for Classification** this substance is classified based on Directive 1272/2008/EC and its amendments (CLP Regulation, GHS)

**TETRAHYDROFURAN****(109-99-9)****Symbols:****Signal Word:** Danger**Hazard(s):**

**H225:** Highly flammable liquid and vapor

**H302:** Harmful if swallowed

**H319:** Causes serious eye irritation

**H335:** May cause respiratory irritation

**H336:** May cause drowsiness or dizziness

**H351:** Suspected of causing cancer <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazards>.

**Prevention:**

**P233:** Keep container tightly closed.

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

**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.

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

**P280:** Wear protective gloves/protective clothing/eye protection/face protection.

**P261:** Avoid breathing dust/fume/gas/mist/vapors/spray.

**P264:** Wash thoroughly after handling.

**Response:**

**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.

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

**P303+P361+P353:** IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

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

**P370+P378:** In case of fire: Use water spray, dry chemical or CO2 for extinction.

**Storage:**

**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

**Disposal:**

**P501:** Dispose of contents/container in accordance with all regulatory and environmental regulations.

**Supplemental:**

**EUH019:** May form explosive peroxides

**SAFETY DATA SHEET****Emergency overview: DANGER!**

**Physical Hazards:** Extremely flammable liquid and vapor. Vapor may cause flash fire. May polymerize. Containers may rupture or explode. May form peroxides during prolonged storage.

**Health Hazards:** Potentially fatal if inhaled, respiratory tract irritation, eye irritation, central nervous system depression. Wear protective equipment when handling product.

**Potential chronic health effects:**

**CARCINOGENIC EFFECTS:** ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans

**DFG:** Category 4 (substances with carcinogenic potential for which genotoxicity play no or at most a minor role)

**MUTAGENIC EFFECTS:** Negative (Ames Test)

**REPRODUCTION TOXICITY:** Not expected. See Section 11.

2.2. Label: See table above.

2.3. Other hazards: None known.

**3. Composition/information on ingredients**

Formula	C <sub>4</sub> H <sub>8</sub> O
CAS-No.	109-99-9
Index-No.	603-025-00-0
EC-No.	203-726-8
Mol Wt.	72.11 g/mol

**4. First Aid Measures****4.1. Description of first aid measures**

**Eye Contact:** Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.

**Skin Contact:** In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

**Inhalation:** Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

**Ingestion:** Wash out mouth and water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

**4.2** Most important symptoms and effects, both acute and delayed:  
Irritant effects; cough, shortness of breath, drowsiness, narcosis.

- 4.3 Indication of immediate medical attention and special treatment needed:  
No additional information available.

## 5. Firefighting measures

### 5.1. Extinguishing media

Suitable extinguishing media: Water spray (fog), dry chemical, CO<sub>2</sub>, foams

Unsuitable extinguishing media: Do not use a water jet.

### 5.2. Special hazards arising from the substance or mixture:

Flammable liquid. Combustible solid. Dust/air mixtures may ignite or explode

### 5.3. Advice for fire fighters:

Special protective equipment for fire fighters: Fire fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Prevent mixing with alkali and amines materials.

Further information: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving a personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. Do not allow fire extinguishing water to contaminate surface or groundwater systems.

## 6. Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures:

Advice for non-emergency personnel: Evacuate the danger zone; follow emergency precautions. Secure emergency assistance immediately. Avoid contact with the material; do not breathe dusts. If possible, provide additional ventilation.

Advice for emergency responders: Do not take action without proper training and emergency equipment. See Section 8 for additional information. Evacuate surrounding areas. Eliminate all ignition sources including flares and all open flames. Avoid all contact with spilled material. Maintain adequate ventilation and wear appropriate respiratory protection.

### 6.2. Environmental precautions:

Avoid dispersal of spilled material, runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

### 6.3. Methods and materials for containment:

Stop leak or spill if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, surface waters, basements or confined areas. Wash spillage into effluent treatment plant. Contain and collect spillage using appropriate personal protective equipment. Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products or if a risk assessment indicates this is necessary. Collect and contain spillage with non-combustible, absorbent material (e.g. sand, earth, vermiculite or diatomaceous earth) and place in a container for disposal according to local regulations. Use spark-proof tools and explosion proof equipment. Contaminated absorbent material may pose the same hazard(s) as the spilled product.

### 6.4. Reference to other sections:

See disposal instruction 13 and exposure controls Section 8.

## 7. Handling and storage

### 7.1. Precautions for safe handling:

Observe all label precautions. Use appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash

hands and face before eating, drinking and smoking. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.

*Advice on protection against fire and explosion:* Keep away from flames and sources of ignition – including static.

#### 7.2. Conditions for safe storage, including any incompatibilities:

Store in accordance with local regulations. Store in a segregated and approved area. Store in original or bulk storage container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials, amines and alkalis.

Bulk storage should be in approved vessels, preferably stainless steel that is grounded and vented. Keep use containers tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

#### 7.3. Specific end uses:

No other additional special end uses are anticipated.

## 8. Exposure controls/personal protection

#### 8.1. Control parameters:

Personal, workplace or environmental monitoring may be necessary to ensure exposures are below recommended and legal limits.

Exposure limits:

**ACGIH:** 50 ppm TWA  
100 ppm STEL

Skin - potential significant contribution to overall exposure by the cutaneous route 0.01 mg/m<sup>3</sup>l

**NIOSH:** 200 ppm TWA; 590 mg/m<sup>3</sup> TWA  
250 ppm STEL; 735 mg/m<sup>3</sup> STEL  
2000 ppm IDLH (10% LEL)

**OSHA (US):** 200 ppm TWA; 590 mg/m<sup>3</sup> TWA

**Mexico:** 200 ppm TWA LMPE-PPT; 590 mg/m<sup>3</sup> TWA LMPE-PPT  
250 ppm STEL [LMPE-CT]; 735 mg/m<sup>3</sup> STEL [LMPE-CT]

**Germany/EU:** 150 mg/m<sup>3</sup> TWA MAK  
Possibility of significant uptake through skin  
300 mg/m<sup>3</sup> STEL

#### **Exposure Limits for Chemicals which may be generated during processing**

This material has no components listed.

#### 8.2. Exposure controls:

Engineering measures: Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory

limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Individual protection measures:

**Hygiene measures:** **Note: tetrahydrofuran penetrates skin and may enhance penetration of other chemicals.** Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Discard contaminated clothing or wash thoroughly before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection:** Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to product dusts, liquid splashes or mists. Goggles should be worn where eye contact is possible.

**Hand protection:** Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is required.

**Glove material:** nitrile or butyl rubber. PVC is not recommended.  
Glove thickness: 0.7 mm or thicker  
Break through time: > 240 minutes

**Other protective equipment:** Flame retardant antistatic protective clothing

**Respiratory protection:** A properly fitted air purifying respirator or air supply respirator should be worn if a risk assessment indicates that respiratory protection is necessary. Respirator selection must be based upon known or measured levels of exposure.

**Environmental exposure controls:** Ventilation and engineering controls to protect workers and ventilate work area to at or below recommended employee exposure levels. Technical measures are preferred over use of personal protective equipment. Environmental controls, such as scrubber or thermal oxidizer may be required to prevent process releases to the atmosphere. Do not empty or flush into drains.

## 9. Physical and chemical properties

### 9.1. Information on basic physical and chemical properties:

<b>Physical State:</b> Liquid	<b>Appearance:</b> Not available
<b>Color:</b> colorless	<b>Physical Form:</b> liquid
<b>Odor:</b> sweet odor	<b>Odor Threshold:</b> 20 - 50 ppm
<b>Texture:</b> free-flowing liquid	<b>pH:</b> Not available
<b>Melting Point:</b> -108 °C	<b>Boiling Point:</b> 67 °C
<b>Evaporation Rate:</b> 14.5 butyl acetate=1	<b>Flash Point:</b> -14 °C CC
<b>LEL:</b> 2 %	<b>OSHA Flammability Class:</b> IB
<b>UEL:</b> 11.8 %	<b>Autoignition:</b> 321 °C
<b>Vapor Pressure:</b> 145 mmHg 20 °C	<b>Vapor Density (air = 1):</b> 2.5
<b>Density:</b> Not available	<b>Specific Gravity (water = 1):</b> 0.8892
<b>Water Solubility:</b> soluble	<b>Part Coeff. Octanol/water:</b> 0.45(Log Pow)
<b>Viscosity:</b> 0.5 cP 20 °C	<b>Volatility:</b> Not available
<b>Molecular Weight:</b> 72.10	<b>Molecular Formula:</b> C <sub>4</sub> H <sub>8</sub> O

#### Solvent Solubility

**Soluble:** benzene, alcohols, ethers, ketones, esters, hydrocarbons

## 10. Stability and reactivity

- 10.1. **Reactivity:**  
In the absence of a stabilizer (BHT, butylated hydroxytoluene) auto oxidation to peroxides may occur, which when heated may decompose violently.
- 10.2. **Chemical stability:**  
May form explosive peroxides. Avoid prolonged storage or contact with air, light or storage and use above room temperature.
- 10.3. **Possibility of hazardous reactions:**  
May polymerizes with evolution of heat. Avoid contact with heat, acids or amines.
- 10.4. **Conditions to avoid:**  
Avoid heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed to heat. Do not store or comingle with alkali materials, amine or oxidizers.
- 10.5. **Incompatible materials:**  
Acids, bases, halogens, metals, oxidizing materials, combustible materials, metal oxides, metal salts
- 10.6. **Hazardous decomposition products:**  
Thermal decomposition will yield oxides of carbon.

## 11. Toxicological information

- 11.1. Information on toxicological effects:

<u>Acute oral toxicity</u> LD50 rat:	1650 mg/kg (RTECS)
<u>Dermal LD50</u> rabbit:	2620 mg/kg (RTECS)
<u>Acute inhalation toxicity:</u>	54 mg/kg 4 hours (IUCLID)
<u>Acute dermal toxicity</u> LD50 rabbit:	2.335 mg/kg (RTECS), skin absorption
<u>Skin irritation:</u>	Irritation. (IUCLID)
<u>Eye irritation (rabbit):</u>	Causes eye irritation (IUCLID)
<u>Sensitization (guinea pig):</u>	Negative
<u>Genotoxicity and Reproductive Effects:</u>	No impairment of reproductive performance expected (Lit)
Ames test:	negative (IUCLID)
<u>Specific target organ toxicity - single exposure:</u>	May cause respiratory irritation.
<u>Specific target organ toxicity - repeated exposure:</u>	This substance is not classified as a specific target organ toxicant, repeated exposure.
<u>Aspiration hazard:</u>	No information available

- 11.2. Additional information:

After uptake of large quantities:

Systemic effects: May aggravate existing skin disorders and allergies.

Further data: Handle using good occupational and environmental health practices.

## 12. Ecological information

### 12.1. Toxicity

Toxicity in fish LC50:

1970-2360 mg/L (96hr Flow-through, *Pimephales promelas*)

2700-3600 mg/L (96 hr Static, *Pimephales promelas*)

Toxicity to daphnia and other aquatic invertebrates:

5930 mg/L (24hr, *Daphnia magna*)

### 12.2. Persistence and degradability:

Not readily biodegradable 39% (OECD 301D)

### 12.3. Bio accumulative potential:

Bioaccumulation not expected. Log Pow<1)

Mobility in soil:

No information available.

### 12.4. Results of PBT and vPvB assessment:

Assessment not available.

### 12.5. Other adverse effects:

No additional environmental adverse effects are known.

Additional ecological information: Do not allow product to enter surface waters, wastewater or soil.

## 13. Disposal considerations

Waste treatment methods: The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. In the US this product is subject to US EPA 40 CFR 262 regulations; Hazardous Waste Number: U213 (Ignitable waste).

## 14. Transport Information

The transport regulations are cited according to international and/or harmonized transport regulations. Possible national deviations and country specific requirements are not considered.

### US DOT Information

Shipping Name: Tetrahydrofuran

Hazard Class: 3

UN/NA #: UN2056

Packing Group: II

Required Label(s): 3

### RID Information

Shipping Name: Tetrahydrofuran

Hazard Class: 3

UN #: UN2056

Packing Group: II

Required Label(s): 3

### IATA/ICAO Information

Shipping Name: Tetrahydrofuran

Hazard Class: 3

UN #: UN2056

Packing Group: II

Required Label(s): 3



**IMDG Information**

Shipping Name: Tetrahydrofuran

Hazard Class: 3

UN #: UN2056

Packing Group: II

Restriction(s): D/E

[UN2056] (II)

**15. Regulatory information**

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

**U.S. Federal Regulations**

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40CFR 355 Appendix A), SARA Section 311/312 (40 CFR 370.21), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), and/or require an OSHA process safety plan.

**TETRAHYDROFURAN (109-99-9)****CERCLA:** 1000 lb final RQ; 454 kg final RQ**TSCA 12b:** Section 4, 1 % de minimus concentration**SARA Section 311/312 (40 CFR 370 Subparts B and C)****Acute Health:** Yes **Chronic Health:** No **Fire:** Yes **Pressure:** No **Reactive:** No**U.S. State Regulations**

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA
TETRAHYDROFURAN	109-99-9	Yes	Yes	Yes	Yes	Yes

Not listed under California Proposition 65

**Canadian WHMIS Ingredient Disclosure List (IDL)**

Components of this material have been checked against the Canadian WHMIS Ingredients Disclosure List. The List is composed of chemicals which must be identified on MSDSs if they are included in products which meet WHMIS criteria specified in the Controlled Products Regulations and are present above the threshold limits listed on the IDL.

**TETRAHYDROFURAN (109-99-9)**

1%

**Germany Water Classification****TETRAHYDROFURAN (109-99-9)**

ID Number 190, hazard class 1 - low hazard to waters

**Symbol(s)****F** Highly Flammable**Xi** Irritant**Risk Phrases****R11** Highly flammable.**R19** May form explosive peroxides.**R36/37** Irritating to eyes and respiratory system.**Safety Phrases****S2** Keep out of the reach of children.

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

**S29** Do not empty into drains.

**S33** Take precautionary measures against static discharges.

#### Component Analysis - Inventory

Component	CAS	US	CA	EU	AU	PH	JP	KR	CN	NZ
TETRAHYDROFURAN	109-99-9	Yes	DSL	EIN	Yes	Yes	Yes	Yes	Yes	Yes

#### Globally Harmonized System of Classification and Labeling (GHS)

##### European Union GHS Classifications

Classifications below according to Regulation (EC) No 1272/2008 on classification, labeling and packaging of substances and mixtures (CLP).

##### **TETRAHYDROFURAN (109-99-9)**

Flammable liquids - Category 2 **H225** Highly flammable liquid and vapor.

Serious eye damage/eye Irritation - Category 2 **H319** Causes serious eye irritation.

Specific target organ toxicity - Single exposure - Category 3 **H335** May cause respiratory irritation.

##### European Union GHS Labeling Information

Labeling information below is according to Regulation (EC) No 1272/2008 on classification, labeling and packaging of substances and mixtures (CLP).

##### **TETRAHYDROFURAN (109-99-9) Symbol(s):**



**Signal Word:** Danger

##### Hazard(s):

**H225:** Highly flammable liquid and vapor

**H319:** Causes serious eye irritation **H335:** May cause respiratory irritation

##### Prevention:

**P233:** Keep container tightly closed.

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

**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.

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

**P280:** Wear protective gloves/protective clothing/eye protection/face protection.

**P261:** Avoid breathing dust/fume/gas/mist/vapors/spray.

**P264:** Wash ... thoroughly after handling.

##### Response:

**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.

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

**P303+P361+P353:** IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

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

**P370+P378:** In case of fire: Use ... for extinction.

### **Storage:**

**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.

### **Disposal:**

**P501:** Dispose of contents/container to.

### **Supplemental:**

**EUH019:** May form explosive peroxides.

### **Japan GHS Classifications**

Classifications below published under Japan's Chemicals Classification Program according to the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

### **TETRAHYDROFURAN (109-99-9)**

Flammable liquids	Category 2	<b>H225</b> Highly flammable liquid and vapor.
Acute toxicity - Oral	Category 4	<b>H302</b> Harmful if swallowed.
Skin corrosion/irritation	Category 2	<b>H315</b> Causes skin irritation.
Skin/Eye irritation	Category 2A	<b>H319</b> Causes serious eye irritation.

*Specific target organ toxicity - Single exposure* Category 2 **H371**  
May cause damage to nervous system.

*Specific target organ toxicity - Single exposure* Category 3 **H335**  
May cause respiratory irritation.

*Specific target organ toxicity - Repeated exposure* Category 1 **H372**  
Causes damage to kidneys, liver, and/or nervous system through prolonged or repeated exposure.

### **Japan GHS Labeling Information**

Labeling information below according to classifications published by Japan's Chemicals Classification Program according to the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

### **TETRAHYDROFURAN (109-99-9)**

#### **Symbol(s):**



**Signal Word:** Danger

#### **Hazard(s):**

**H225:** Highly flammable liquid and vapor

**H302:** Harmful if swallowed

**H315:** Causes skin irritation

**H319:** Causes serious eye irritation **H371:** May cause damage to organs **H335:** May cause respiratory irritation

**H372:** Causes damage to organs through prolonged or repeated exposure

### **Prevention:**

**P233:** Keep container tightly closed.

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

**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.

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

**P280:** Wear protective gloves/protective clothing/eye protection/face protection.

**P260:** Do not breathe dust/fume/gas/mist/vapors/spray.

**P264:** Wash ... thoroughly after handling.

**P270:** Do not eat, drink or smoke when using this product.

### **Response:**

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

**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.

**P337+P313:** If eye irritation persists: Get medical advice/attention. **P302+P352:** IF ON SKIN: Wash with plenty of soap and water. **P303+P361+P353:** IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

**P362+P364:** Take off contaminated clothing and wash it before reuse. **P332+P313:** If skin irritation occurs: Get medical advice/attention. **P301+P312:** IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.

**P321:** Specific treatment (see ... on this label).

**P330:** Rinse mouth.

**P370+P378:** In case of fire: Use ... for extinction.

### **Storage:**

**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.

### **Disposal:**

**P501:** Dispose of contents/container to.

### **Korea GHS Classifications (SV)**

Classifications below published by Korea's Ministry of Environment (MOE), Ministry of Employment and Labor (MOEL) or Office of National Emergency Management (NEMA, physical hazards only).

**TETRAHYDROFURAN (109-99-9)**

<b>MOEL:</b>	Flammable liquids - Category 2	<b>H225</b> Highly flammable liquid and vapor.
	Acute toxicity - Oral - Category 4	<b>H302</b> Harmful if swallowed.
	Skin corrosion/irritation - Category 2	<b>H315</b> Causes skin irritation.
	Serious eye damage/eye Irritation - Cat 2A	<b>H319</b> Causes serious eye irritation.
	Specific target organ toxicity - Single exposure - Category 2	<b>H371</b> May cause damage to organs.
	Specific target organ toxicity - Single exposure - Category 3	<b>H335</b> May cause respiratory irritation.
	Specific target organ toxicity - Repeated exposure - Category 1 prolonged or repeated exposure.	<b>H372</b> Causes damage to organs through prolonged or repeated exposure.
<b>NEMA:</b>	Flammable liquids - Category 2	
	<b>H225</b> Highly flammable liquid and vapor.	

**Korea GHS Labeling Information**

Labeling information below according to classifications published by Korea's Ministry of Environment (MOE), Ministry of Employment and Labor (MOEL) or Office of National Emergency Management (NEMA, physical hazards only).

**TETRAHYDROFURAN (109-99-9)****Symbol(s):****Signal Word: Danger****Hazard(s):**

- H225:** Highly flammable liquid and vapor
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- H371:** May cause damage to organs
- H335:** May cause respiratory irritation
- H372:** Causes damage to organs through prolonged or repeated exposure

**Prevention:**

- P233:** Keep container tightly closed.
- P210:** Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
- 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.
- P271:** Use only outdoors or in a well-ventilated area.
- P280:** Wear protective gloves/protective clothing/eye protection/face protection.
- P260:** Do not breathe dust/fume/gas/mist/vapors/spray.
- P264:** Wash ... thoroughly after handling.
- P270:** Do not eat, drink or smoke when using this product.

**Response:**

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

**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.

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

**P302+P352:** IF ON SKIN: Wash with plenty of soap and water.

**P303+P361+P353:** IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

**P362+P364:** Take off contaminated clothing and wash it before reuse.

**P332+P313:** If skin irritation occurs: Get medical advice/attention.

**P301+P312:** IF SWALLOWED: Call a POISON CENTER or Doctor/physician if you feel unwell.

**P321:** Specific treatment (see ... on this label).

**P330:** Rinse mouth.

**P370+P378:** In case of fire: Use ... for extinction.

#### **Storage:**

**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.

#### **Disposal:**

**P501:** Dispose of contents/container to.

#### **Symbol(s):**



**Signal Word:** Danger

#### **Hazard(s):**

**H225:** Highly flammable liquid and vapor

#### **Prevention:**

**P233:** Keep container tightly closed.

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

**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.

**P280:** Wear protective gloves/protective clothing/eye protection/face protection.

#### **Response:**

**P303+P361+P353:** IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

**P370+P378:** In case of fire: Use ... for extinction.

**Storage:**

**P403+P235:** Store in a well-ventilated place. Keep cool.

**Disposal:**

**P501:** Dispose of contents/container to...

**New Zealand GHS Classifications**

Classifications below according to the Environmental Risk Management Authority's (ERMA) Hazardous Substances and New Organisms (HSNO) Act, as amended.

**TETRAHYDROFURAN (109-99-9) Approval: HSR001224**

Flammable liquids -	Category 2 <b>H225</b> Highly flammable liquid and vapor.
Acute toxicity - Oral -	Category 4 <b>H302</b> Harmful if swallowed.
Skin corrosion/irritation -	Category 2 <b>H315</b> Causes skin irritation.
Serious eye damage/eye Irritation -	Category 2A <b>H319</b> Causes serious eye irritation.
Carcinogenicity -	Category 2 <b>H351</b> Suspected of causing cancer.
Specific target organ toxicity - Repeated exposure – Inhalation - Category 2 to respiratory tract through prolonged or repeated exposure if inhaled.	<b>H373</b> May cause damage
Terrestrial Vertebrate Eco toxicity -	Category 3 <b>H433</b> Harmful to terrestrial vertebrates.

**New Zealand GHS Labeling Information**

Labeling information below according to classifications published by New Zealand's Environmental Risk Management Authority's (ERMA) Hazardous Substances and New Organisms (HSNO) Act, as amended.

**TETRAHYDROFURAN (109-99-9)****Symbol(s):**

**Signal Word: Danger**

**Hazard(s):**

- H225:** Highly flammable liquid and vapor
- H302:** Harmful if swallowed
- H315:** Causes skin irritation
- H319:** Causes serious eye irritation
- H351:** Suspected of causing cancer
- H373:** May cause damage to organs through prolonged or repeated exposure
- H433:** Harmful to terrestrial vertebrates

**Prevention:**

- P233:** Keep container tightly closed.
- P210:** Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
- 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.

**P280:** Wear protective gloves/protective clothing/eye protection/face protection.

**P260:** Do not breathe dust/fume/gas/mist/vapors/spray.

**P264:** Wash ... thoroughly after handling.

**P201:** Obtain special instructions before use.

**P202:** Do not handle until all safety precautions have been read and understood.

**P270:** Do not eat, drink or smoke when using this product.

### **Response:**

**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.

**P302+P352:** IF ON SKIN: Wash with plenty of soap and water.

**P303+P361+P353:** IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

**P362+P364:** Take off contaminated clothing and wash it before reuse. **P332+P313:** If skin irritation occurs:

Get medical advice/attention.

**P301+P312:** IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.

**P321:** Specific treatment (see ... on this label).

**P330:** Rinse mouth.

**P370+P378:** In case of fire: Use ... for extinction.

### **Storage:**

**P403+P235:** Store in a well-ventilated place. Keep cool.

**P405:** Store locked up.

### **Disposal:**

**P501:** Dispose of contents/container to...

## **Taiwan GHS Classifications**

Information below presented according to Taiwan's Bureau of Standards, Metrology and Inspection (BSMI) of the Ministry of Economic Affairs. This agency has published a series of standards (CNS 15030 1-27 Chemical Classification and Labeling) which provide guidance on classification and labeling of chemicals according to GHS.

### **TETRAHYDROFURAN (109-99-9)**

<b>Taiwan:</b>	Flammable liquids -	Category 2 <b>H225</b> Highly flammable liquid and vapor.
	Acute toxicity - Oral -	Category 4 <b>H302</b> Harmful if swallowed.
	Skin corrosion/irritation -	Category 2 <b>H315</b> Causes skin irritation.
	Serious eye damage/eye Irritation -	Category 2A <b>H319</b> Causes serious eye irritation.

### **Taiwan GHS Labeling Information**

Labeling information below according to classifications published by Taiwan's Bureau of Standards, Metrology and Inspection (BSMI) of the Ministry of Economic Affairs. This agency has published a series of standards (CNS 15030 1-27 Chemical Classification and Labeling) which provide guidance on classification and labeling of chemicals according to GHS.

### **TETRAHYDROFURAN (109-99-**

#### **9) Symbol(s):**





**Signal Word:** Danger

**Hazard(s):**

H225: Highly flammable liquid and vapor

H302: Harmful if swallowed

H315: Causes skin irritation

H319: Causes serious eye irritation

**Prevention:**

P233: Keep container tightly closed.

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

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.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P264: Wash ... thoroughly after handling.

P270: Do not eat, drink or smoke when using this product.

**Response:**

**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.

**P302+P352:** IF ON SKIN: Wash with plenty of soap and water. **P303+P361+P353:** IF ON SKIN (or hair):

Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

**P362+P364:** Take off contaminated clothing and wash it before reuse.

**P332+P313:** If skin irritation occurs: Get medical advice/attention.

**P301+P312:** IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.

**P321:** Specific treatment (see ... on this label).

**P330:** Rinse mouth.

**P370+P378:** In case of fire: Use ... for extinction.

**Storage:**

**P403+P235:** Store in a well-ventilated place. Keep cool.

**Disposal:**

**P501:** Dispose of contents/container to...

Chemical Safety Assessment:

Sipchem has not conducted a chemical safety assessment for this product.

## 16. Other information

### 16.1. Training Advice:

Provide safety information, instruction and training to operators handling tetrahydrofuran.

The information and recommendations herein are taken from data contained in independent, industry recognized references. Although reasonable care has been taken in the preparation of the information herein, Sipchem and International Diol Company make no guarantee, warranty (express or implied) or other representation and assume no responsibility as to the accuracy or suitability of such information for application of the information, since conditions of its use are beyond control of these companies. Sipchem and International Diol Company shall not bear any liability whatsoever for any loss or damage incurred in connection with the use of this substance.