

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form	: Substance
Trade name	: Tetrahydrofuran
Chemical name	: tetrahydrofuran
IUPAC name	: Tetrahydrofuran
EC Index-No.	: 603-025-00-0
EC-No.	: 203-726-8
CAS-No.	: 109-99-9
REACH registration No	: 01-2119444314-46
Product code	: ED11450010
Type of product	: Pure substance, Commercial product is usually stabilized
Formula	: C ₄ H ₈ O
Synonyms	: 1,4-epoxybutane / agrisynth THF / butane, 1,4-epoxy- / butane, alpha,delta-oxide / butylene oxide / cyclotetramethylene oxide / diethylene oxide (=tetrahydrofuran) / furan, tetrahydro- / furanidine / hydrofuran / oxacyclopentane / oxolane / oxyl / tetrahydrofuran / tetramethylene oxide / THF
Product group	: Trade product
BIG No	: 53911

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

1.2.1. Relevant identified uses

Industrial/Professional use spec	: Industrial For professional use only
Use of the substance/mixture	: Solvent Laboratory chemical

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Monument Chemical BV B.V.B.A.
Ketenislaan 3
BE- B-9130 Kallo
Belgium
T +32 3 570 28 11
sds@monumentchemical.com - www.monumentchemical.com

1.4. Emergency telephone number

Emergency number : BIG 24h/24h: +32 14 58 45 45

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Flammable liquids, Category 2	H225
Acute toxicity (oral), Category 4	H302
Serious eye damage/eye irritation, Category 2	H319
Carcinogenicity, Category 2	H351
Specific target organ toxicity — Single exposure, Category 3, Narcosis	H336
Specific target organ toxicity — Single exposure, Category 3, Respiratory tract irritation	H335

Full text of H- and EUH-statements: see section 16

Specific concentration limits:

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(25 ≤C < 100)
(25 ≤C < 100)

Eye Irrit. 2, H319
STOT SE 3, H335

Adverse physicochemical, human health and environmental effects

No additional information available

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP)



Signal word (CLP)

: Danger

Hazard statements (CLP)

: H225 - Highly flammable liquid and vapour.
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.

Precautionary statements (CLP)

: P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233 - Keep container tightly closed.
P240 - Ground and bond container and receiving equipment.
P241 - Use explosion-proof electrical, ventilating, lighting equipment.
P261 - Avoid breathing dust, fume, gas, mist, spray, vapours.
P264 - Wash hands thoroughly after handling.
P270 - Do not eat, drink or smoke when using this product.
P271 - Use only outdoors or in a well-ventilated area.
P280 - Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.
P301+P312 - IF SWALLOWED: Call a POISON CENTRE or doctor if you feel unwell.
P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water .
P304+P340 - IF INHALED: Remove person to fresh air and keep 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.
P312 - Call a POISON CENTRE or doctor if you feel unwell.
P330 - Rinse mouth.
P337+P313 - If eye irritation persists: Get medical advice/attention.
P370+P378 - In case of fire: Use alcohol resistant foam, carbon dioxide (CO₂), dry extinguishing powder, Water spray to extinguish.
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 hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

EUH-statements

: EUH019 - May form explosive peroxides.

2.3. Other hazards

This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII

This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

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SECTION 3: Composition/information on ingredients

3.1. Substances

Substance type : Mono-constituent

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
tetrahydrofuran	CAS-No.: 109-99-9 EC-No.: 203-726-8 EC Index-No.: 603-025-00-0 REACH-no: 01-2119444314-46	≥ 98	Flam. Liq. 2, H225 Acute Tox. 4 (Oral), H302 Eye Irrit. 2, H319 Carc. 2, H351 STOT SE 3, H336 STOT SE 3, H335

Specific concentration limits:

Name	Product identifier	Specific concentration limits
tetrahydrofuran	CAS-No.: 109-99-9 EC-No.: 203-726-8 EC Index-No.: 603-025-00-0 REACH-no: 01-2119444314-46	(25 ≤C < 100) Eye Irrit. 2, H319 (25 ≤C < 100) STOT SE 3, H335

Full text of H- and EUH-statements: see section 16

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation	: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
First-aid measures after skin contact	: Rinse skin with water/shower. Take off immediately all contaminated clothing.
First-aid measures after eye contact	: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Consult an eye specialist. Get medical advice/attention.
First-aid measures after ingestion	: Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention. Call a POISON CENTER/doctor if you feel unwell.

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

Symptoms/effects after inhalation	: May cause respiratory irritation. May cause drowsiness or dizziness.
Symptoms/effects after skin contact	: Not irritating. Red skin.
Symptoms/effects after eye contact	: Causes serious eye irritation.
Symptoms/effects after ingestion	: Swallowing a small quantity of this material will result in serious health hazard.
Chronic symptoms	: Enlargement/affection of the liver. Affection of the renal tissue. Visual disturbances. Auditory disturbances.

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

No additional information available

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SECTION 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media : Foam. Dry powder. Carbon dioxide. Water spray. Sand.
Unsuitable extinguishing media : Do not use a heavy water stream.

5.2. Special hazards arising from the substance or mixture

- Fire hazard : Highly flammable liquid and vapour.
Explosion hazard : May form flammable/explosive vapour-air mixture. Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries. May form explosive peroxides.
Hazardous decomposition products in case of fire : Upon combustion: CO and CO₂ are formed.

5.3. Advice for firefighters

- Firefighting instructions : Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire fighting water from entering the environment. DO NOT fight fire when fire reaches explosives. Evacuate area.
Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- General measures : Remove ignition sources. Use special care to avoid static electric charges. No open flames. No smoking.

6.1.1. For non-emergency personnel

- Protective equipment : Gloves (EN 374). Protective goggles (EN 166). Protective clothing (EN 14605 or EN 13034). Large spills/in enclosed spaces: self-contained breathing apparatus (EN 136 + EN 137).
Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders

- Protective equipment : Equip cleanup crew with proper protection. Avoid breathing dust/fume/gas/mist/vapours/spray.
Emergency procedures : Ventilate area.

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

- For containment : Contain released product, collect/pump into suitable containers. Plug the leak, cut off the supply. Dam up the liquid spill. Try to reduce evaporation. Measure the concentration of the explosive gas-air mixture. Dilute/disperse combustible gas/vapour with water curtain. Provide equipment/receptacles with earthing. Do not use compressed air for pumping over spills.
Methods for cleaning up : Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Collect spillage. Store away from other materials.

6.4. Reference to other sections

See Section 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Additional hazards when processed : Handle empty containers with care because residual vapours are flammable. Hazardous waste due to potential risk of explosion.

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Precautions for safe handling	: Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapour. No open flames. No smoking. Use only non-sparking tools. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid breathing dust/fume/gas/mist/vapours/spray. Use only outdoors or in a well-ventilated area. Keep away from sources of ignition - No smoking.
Hygiene measures	: Do not eat, drink or smoke when using this product. Wash hands, forearms and face thoroughly after handling.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures	: Proper grounding procedures to avoid static electricity should be followed. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting equipment.
Storage conditions	: Keep only in the original container in a cool, well ventilated place away from : Heat sources, Ignition sources, Incompatible materials. Keep in fireproof place. Keep container tightly closed.
Incompatible products	: Strong bases. Strong acids. Oxidizing agent.
Incompatible materials	: Sources of ignition. Direct sunlight. Heat sources.
Storage temperature	: 2 – 8 °C
Heat and ignition sources	: KEEP SUBSTANCE AWAY FROM: heat sources. ignition sources.
Information on mixed storage	: KEEP SUBSTANCE AWAY FROM: oxidizing agents. (strong) acids. (strong) bases.
Storage area	: Meet the legal requirements. Detached building. Store in a cool area. Store in a dry area. Store in a dark area. Keep container in a well-ventilated place. Fireproof storeroom. Store only in a limited quantity. Provide for a tub to collect spills. Provide the tank with earthing. May be stored under nitrogen. May be stored under argon. Store only in a stabilised state.
Special rules on packaging	: SPECIAL REQUIREMENTS: closing. opaque. correctly labelled. meet the legal requirements. Secure fragile packagings in solid containers.
Packaging materials	: SUITABLE MATERIAL: steel. stainless steel. aluminium. iron. glass. stoneware/porcelain. MATERIAL TO AVOID: synthetic material. tin.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

8.1.1 National occupational exposure and biological limit values

tetrahydrofuran (109-99-9)	
EU - Indicative Occupational Exposure Limit (IOEL)	
IOEL TWA	150 mg/m ³
IOEL TWA [ppm]	50 ppm
IOEL STEL	300 mg/m ³
IOEL STEL [ppm]	100 ppm
Belgium - Occupational Exposure Limits	
OEL TWA	150 mg/m ³
OEL TWA [ppm]	50 ppm
OEL STEL	300 mg/m ³
OEL STEL [ppm]	100 ppm
France - Occupational Exposure Limits	
VME (OEL TWA)	150 mg/m ³
VME (OEL TWA) [ppm]	50 ppm

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tetrahydrofuran (109-99-9)	
VLE (OEL C/STEL)	300 mg/m ³
VLE (OEL C/STEL) [ppm]	100 ppm
Germany - Occupational Exposure Limits (TRGS 900)	
Local name	Tetrahydrofuran
AGW (OEL TWA) [1]	150 mg/m ³
AGW (OEL TWA) [2]	50 ppm
Peak exposure limitation factor	2(l)
Remark	DFG,EU,H,Y
Regulatory reference	TRGS900
Germany - Biological limit values (TRGS 903)	
Local name	Tetrahydrofuran
Biological limit value	2 mg/l Parameter: Tetrahydrofuran - Untersuchungsmaterial: U = Urin - Probenahmezeitpunkt: b) Expositionsende, bzw. Schichtende - Festlegung/Begründung: 11/2012 DFG
Regulatory reference	TRGS 903
Italy - Occupational Exposure Limits	
Local name	Tetraidrofurano
OEL TWA	150 mg/m ³
OEL TWA [ppm]	50 ppm
OEL STEL	300 mg/m ³
OEL STEL [ppm]	100 ppm
Remark	Cute
Regulatory reference	Allegato XXXVIII del D.Lgs. 9 aprile 2008, n. 81 e s.m.i.
Netherlands - Occupational Exposure Limits	
Local name	Tetrahydrofuraan
TGG-8u (OEL TWA)	300 mg/m ³
TGG-8u (OEL TWA) [ppm]	100 ppm
TGG-15min (OEL STEL)	600 mg/m ³
TGG-15min (OEL STEL) [ppm]	200 ppm
Remark	H (Huidopname) Stoffen die relatief gemakkelijk door de huid kunnen worden opgenomen, hetgeen een substantiële bijdrage kan betekenen aan de totale inwendige blootstelling, hebben in de lijst een Haanduiding. Bij deze stoffen moeten naast maatregelen tegen inademing ook adequate maatregelen ter voorkoming van huidcontact worden genomen.
Regulatory reference	Arbeidsomstandighedenregeling 2021
Spain - Occupational Exposure Limits	
Local name	Tetrahidrofurano
VLA-ED (OEL TWA) [1]	150 mg/m ³
VLA-ED (OEL TWA) [2]	50 ppm
VLA-EC (OEL STEL)	300 mg/m ³
VLA-EC (OEL STEL) [ppm]	100 ppm

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tetrahydrofuran (109-99-9)	
Remark	Vía dérmica (Indica que, en las exposiciones a esta sustancia, la aportación por la vía cutánea puede resultar significativa para el contenido corporal total si no se adoptan medidas para prevenir la absorción. En estas situaciones, es aconsejable la utilización del control biológico para poder cuantificar la cantidad global absorbida del contaminante. Para más información véase el Apartado 5 de este documento), VLI (Agente químico para el que la U.E. estableció en su día un valor límite indicativo. Todos estos agentes químicos figuran al menos en una de las directivas de valores límite indicativos publicadas hasta ahora (ver Anexo C. Bibliografía). Los estados miembros disponen de un tiempo fijado en dichas directivas para su transposición a los valores límites de cada país miembro. Una vez adoptados, estos valores tienen la misma validez que el resto de los valores adoptados por el país), VLB® (Agente químico que tiene Valor Límite Biológico específico en este documento).
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2021. INSHT
Spain - Biological limit values	
Local name	Tetrahydrofurano
BLV	2 mg/l Parámetro: Tetrahydrofurano - Medio: Orina - Momento de muestreo: Final de la jornada laboral
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2021. INSHT
United Kingdom - Occupational Exposure Limits	
WEL TWA (OEL TWA) [1]	150 mg/m ³
WEL TWA (OEL TWA) [2]	50 ppm
WEL STEL (OEL STEL)	300 mg/m ³
WEL STEL (OEL STEL) [ppm]	100 ppm
USA - ACGIH - Occupational Exposure Limits	
Local name	Tetrahydrofuran
ACGIH OEL TWA [ppm]	50 ppm
ACGIH OEL STEL [ppm]	100 ppm
Remark (ACGIH)	URT irr; CNS impair; kidney dam
Regulatory reference	ACGIH 2022
USA - ACGIH - Biological Exposure Indices	
Local name	TETRAHYDROFURAN
BEI	2 mg/l Parameter: Tetrahydrofuran - Medium: urine - Sampling time: End of shift
Regulatory reference	ACGIH 2022

8.1.2. Recommended monitoring procedures

No additional information available

8.1.3. Air contaminants formed

No additional information available

8.1.4. DNEL and PNEC

tetrahydrofuran (109-99-9)	
DNEL/DMEL (Workers)	
Acute - systemic effects, inhalation	96 mg/m ³
Acute - local effects, inhalation	300 mg/m ³
Long-term - systemic effects, dermal	12.6 mg/kg bodyweight/day

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tetrahydrofuran (109-99-9)	
Long-term - systemic effects, inhalation	72.4 mg/m ³
Long-term - local effects, inhalation	150 mg/m ³
DNEL/DMEL (General population)	
Acute - systemic effects, inhalation	52 mg/m ³
Acute - local effects, inhalation	150 mg/m ³
Long-term - systemic effects, oral	1.5 mg/kg bodyweight/day
Long-term - systemic effects, inhalation	13 mg/m ³
Long-term - systemic effects, dermal	1.5 mg/kg bodyweight/day
Long-term - local effects, inhalation	75 mg/m ³
PNEC (Water)	
PNEC aqua (freshwater)	4.32 mg/l
PNEC aqua (marine water)	0.432 mg/l
PNEC aqua (intermittent, freshwater)	21.6 mg/l
PNEC (Sediment)	
PNEC sediment (freshwater)	23.3 mg/kg dwt
PNEC sediment (marine water)	2.33 mg/kg dwt
PNEC (Soil)	
PNEC soil	2.13 mg/kg dwt
PNEC (Oral)	
PNEC oral (secondary poisoning)	67 mg/kg food
PNEC (STP)	
PNEC sewage treatment plant	4.6 mg/l

8.1.5. Control banding

No additional information available

8.2. Exposure controls

8.2.1. Appropriate engineering controls

No additional information available

8.2.2. Personal protection equipment

Personal protective equipment:

Avoid all unnecessary exposure.

8.2.2.1. Eye and face protection

Eye protection:

Chemical goggles or safety glasses

8.2.2.2. Skin protection

Skin and body protection:

Protective clothing (EN 14605 or EN 13034)

Hand protection:

Wear protective gloves.

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Other skin protection

Materials for protective clothing:

GIVE EXCELLENT RESISTANCE: polyethylene. GIVE GOOD RESISTANCE: tetrafluoroethylene. GIVE LESS RESISTANCE: PVA. GIVE POOR RESISTANCE: butyl rubber. chlorinated polyethylene. natural rubber. nitrile rubber. PVC. neoprene/natural rubber. nitrile rubber/PVC. viton

8.2.2.3. Respiratory protection

Respiratory protection:

Where exposure through inhalation may occur from use, respiratory protection equipment is recommended

8.2.2.4. Thermal hazards

No additional information available

8.2.3. Environmental exposure controls

Other information:

Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Appearance	: Liquid.
Molecular mass	: 72.11 g/mol
Colour	: Colourless.
Odour	: Fruity odour.
Odour threshold	: No data available
pH	: No data available in the literature
Relative evaporation rate (butylacetate=1)	: 8
Relative evaporation rate (ether=1)	: 2.3
Melting point	: -108 °C (1013 hPa)
Freezing point	: No data available
Boiling point	: 65 °C (1013 hPa)
Flash point	: -21 °C (Closed cup, 1013 hPa, DIN 51755: Abel-Pensky)
Critical temperature	: 267 °C
Auto-ignition temperature	: 215 °C (1013 hPa, DIN 51794 (2003))
Decomposition temperature	: No data available in the literature
Flammability (solid, gas)	: No data available
Vapour pressure	: 170 hPa (20 °C)
Vapour pressure at 50 °C	: 587 hPa (Antoine equation)
Critical pressure	: 51880 hPa
Relative vapour density at 20 °C	: 2.5
Relative density	: 0.88 (25 °C)
Relative density of saturated gas/air mixture	: 1.3
Density	: 883 kg/m ³ (25 °C)
Solubility	: Soluble in water. Soluble in ethanol. Soluble in ether. Soluble in acetone. Soluble in chloroform. Soluble in dimethyl sulfoxide. Soluble in oils/fats. Water: miscible Ethanol: > 10 g/100ml Acetone: > 10 g/100ml
Partition coefficient n-octanol/water (Log Pow)	: 0.45 (Experimental value, Equivalent or similar to OECD 107, 25 °C)
Viscosity, kinematic	: No data available in the literature
Viscosity, dynamic	: 0.456 mPa.s (25 °C)
Explosive properties	: May form explosive peroxides.
Oxidising properties	: No data available
Explosive limits	: 1.8 – 11.8 vol %
Lower explosive limit (LEL)	: 1.8 vol %
Upper explosive limit (UEL)	: 11.8 vol %
Particle size	: Not applicable (liquid)

9.2. Other information

Minimum ignition energy : 0.54 mJ

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Saturation concentration : 592 g/m³
VOC content : 100 %
Other properties : Gas/vapour heavier than air at 20°C. Clear. Hygroscopic. Volatile. Neutral reaction. May generate electrostatic charges.

SECTION 10: Stability and reactivity

10.1. Reactivity

Reacts violently with (strong) oxidizers: (increased) risk of fire/explosion. Reacts with (some) bases. Unstabilised product reacts on exposure to air: peroxidation resulting in increased fire or explosion risk. Unstabilised product: on exposure to light: peroxidation resulting in increased fire or explosion risk. May form explosive peroxides.

10.2. Chemical stability

Highly flammable liquid and vapour. May form flammable/explosive vapour-air mixture.

10.3. Possibility of hazardous reactions

Reacts vigorously with strong oxidizers and acids.

10.4. Conditions to avoid

Direct sunlight. Extremely high or low temperatures. Open flame. Heat. Sparks. Overheating.

10.5. Incompatible materials

Strong acids. Strong bases. Oxidizing agent.

10.6. Hazardous decomposition products

fume. Carbon monoxide. Carbon dioxide. May release flammable gases. May form explosive peroxides.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity (oral) : Harmful if swallowed.
Acute toxicity (dermal) : Not classified
Acute toxicity (inhalation) : Not classified

tetrahydrofuran (109-99-9)	
LD50 oral rat	1650 mg/kg bodyweight
LD50 dermal rat	> 2000 mg/kg bodyweight (OECD 402: Acute Dermal Toxicity, 24 h, Rat, Male / female, Experimental value, Dermal)
LC50 Inhalation - Rat	> 14.7 mg/l air (US EPA, 6 h, Rat, Male / female, Experimental value, Inhalation, 15 day(s))
LC50 Inhalation - Rat [ppm]	> 5000 ppm Animal: rat, Guideline: other:, Remarks on results: other:

Skin corrosion/irritation : Not classified
pH: No data available in the literature
Additional information : Based on available data, the classification criteria are not met
Serious eye damage/irritation : Causes serious eye irritation.
pH: No data available in the literature
Respiratory or skin sensitisation : Not classified
Additional information : Based on available data, the classification criteria are not met
Germ cell mutagenicity : Not classified
Additional information : Based on available data, the classification criteria are not met
Carcinogenicity : Suspected of causing cancer.
Reproductive toxicity : Not classified
Additional information : Based on available data, the classification criteria are not met
STOT-single exposure : May cause drowsiness or dizziness. May cause respiratory irritation.

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STOT-repeated exposure	: Not classified
Additional information	: Based on available data, the classification criteria are not met
Aspiration hazard	: Not classified
Additional information	: Based on available data, the classification criteria are not met

tetrahydrofuran (109-99-9)

Viscosity, kinematic	No data available in the literature
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Potential adverse human health effects and symptoms	: Harmful if swallowed.
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SECTION 12: Ecological information

12.1. Toxicity

Ecology - general	: Not classified as dangerous for the environment according to the criteria of Regulation (EC) No 1272/2008.
Ecology - air	: Not included in the list of substances which may contribute to the greenhouse effect (IPCC). Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 517/2014). Photooxidation in the air. Not classified as dangerous for the ozone layer (Regulation (EC) No 1005/2009).
Ecology - water	: Not harmful to crustacea (Daphnia). Not harmful to fishes. Groundwater pollutant. Inhibition of activated sludge. Not harmful to algae. Slightly harmful to bacteria.
Hazardous to the aquatic environment, short-term (acute)	: Not classified
Hazardous to the aquatic environment, long-term (chronic)	: Not classified

tetrahydrofuran (109-99-9)

LC50 - Fish [1]	2160 mg/l (Equivalent or similar to OECD 203, 96 h, Pimephales promelas, Flow-through system, Fresh water, Experimental value, Lethal)
NOEC chronic fish	216 mg/l Test organisms (species): Pimephales promelas Duration: '33 d'

12.2. Persistence and degradability

tetrahydrofuran (109-99-9)

Persistence and degradability	Not established.
Chemical oxygen demand (COD)	1.855 g O ₂ /g substance
ThOD	2.44 g O ₂ /g substance

12.3. Bioaccumulative potential

tetrahydrofuran (109-99-9)

Partition coefficient n-octanol/water (Log Pow)	0.45 (Experimental value, Equivalent or similar to OECD 107, 25 °C)
Bioaccumulative potential	Not established.

12.4. Mobility in soil

tetrahydrofuran (109-99-9)

Surface tension	26400 mN/m (25 °C)
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	1.26 – 1.37 (log Koc, Experimental value)
Ecology - soil	Highly mobile in soil.

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12.5. Results of PBT and vPvB assessment

tetrahydrofuran (109-99-9)

This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII

This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

Results of PBT assessment

The product does not meet the PBT and vPvB classification criteria

12.6. Other adverse effects

Additional information : Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product/Packaging disposal recommendations : Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

Additional information : Handle empty containers with care because residual vapours are flammable. Hazardous waste due to potential risk of explosion.

Ecology - waste materials : Avoid release to the environment.

European List of Waste (LoW) code : 15 01 10* - packaging containing residues of or contaminated by dangerous substances
07 01 04* - other organic solvents, washing liquids and mother liquors

SECTION 14: Transport information

In accordance with ADR / IMDG / IATA / ADN / RID

14.1 UN number

UN-No. (ADR) : UN 2056
UN-No. (IMDG) : UN 2056
UN-No. (IATA) : UN 2056
UN-No. (ADN) : UN 2056
UN-No. (RID) : UN 2056

14.2. UN proper shipping name

Proper Shipping Name (ADR) : TETRAHYDROFURAN
Proper Shipping Name (IMDG) : TETRAHYDROFURAN
Proper Shipping Name (IATA) : Tetrahydrofuran
Proper Shipping Name (ADN) : TETRAHYDROFURAN
Proper Shipping Name (RID) : TETRAHYDROFURAN
Transport document description (ADR) : UN 2056 TETRAHYDROFURAN, 3, II, (D/E)
Transport document description (IMDG) : UN 2056 TETRAHYDROFURAN, 3, II (< -18°C c.c.)
Transport document description (IATA) : UN 2056 Tetrahydrofuran, 3, II
Transport document description (ADN) : UN 2056 TETRAHYDROFURAN, 3, II
Transport document description (RID) : UN 2056 TETRAHYDROFURAN, 3, II

14.3. Transport hazard class(es)

ADR
Transport hazard class(es) (ADR) : 3
Danger labels (ADR) : 3



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IMDG

Transport hazard class(es) (IMDG) : 3
Danger labels (IMDG) : 3



IATA

Transport hazard class(es) (IATA) : 3
Danger labels (IATA) : 3



ADN

Transport hazard class(es) (ADN) : 3
Danger labels (ADN) : 3



RID

Transport hazard class(es) (RID) : 3
Danger labels (RID) : 3



14.4. Packing group

Packing group (ADR) : II
Packing group (IMDG) : II
Packing group (IATA) : II
Packing group (ADN) : II
Packing group (RID) : II

14.5. Environmental hazards

Dangerous for the environment : No
Marine pollutant : No
Other information : No supplementary information available

14.6. Special precautions for user

Overland transport

Transport regulations (ADR) : Subject to the provisions
Classification code (ADR) : F1
Limited quantities (ADR) : 1I
Excepted quantities (ADR) : E2
Packing instructions (ADR) : P001, IBC02, R001
Mixed packing provisions (ADR) : MP19
Portable tank and bulk container instructions (ADR) : T4
Portable tank and bulk container special provisions (ADR) : TP1
Tank code (ADR) : LGBF
Vehicle for tank carriage : FL
Transport category (ADR) : 2

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Special provisions for carriage - Operation (ADR) : S2, S20
Hazard identification number (Kemler No.) : 33
Orange plates :



Tunnel restriction code (ADR) : D/E
EAC code : •2YE

Transport by sea

Transport regulations (IMDG) : Subject to the provisions
Limited quantities (IMDG) : 1 L
Excepted quantities (IMDG) : E2
Packing instructions (IMDG) : P001
IBC packing instructions (IMDG) : IBC02
Tank instructions (IMDG) : T4
Tank special provisions (IMDG) : TP1
EmS-No. (Fire) : F-E
EmS-No. (Spillage) : S-D
Stowage category (IMDG) : B
Flash point (IMDG) : below -18°C c.c.
Properties and observations (IMDG) : Colourless liquid with an ethereal odour. Flashpoint: below -18°C c.c. Explosive limits: 1.5% to 12% Miscible with water.

Air transport

Transport regulations (IATA) : Subject to the provisions
PCA Excepted quantities (IATA) : E2
PCA Limited quantities (IATA) : Y341
PCA limited quantity max net quantity (IATA) : 1L
PCA packing instructions (IATA) : 353
PCA max net quantity (IATA) : 5L
CAO packing instructions (IATA) : 364
CAO max net quantity (IATA) : 60L
ERG code (IATA) : 3H

Inland waterway transport

Classification code (ADN) : F1
Limited quantities (ADN) : 1 L
Excepted quantities (ADN) : E2
Carriage permitted (ADN) : T
Equipment required (ADN) : PP, EX, A
Ventilation (ADN) : VE01
Number of blue cones/lights (ADN) : 1

Rail transport

Transport regulations (RID) : Subject to the provisions
Classification code (RID) : F1
Limited quantities (RID) : 1L
Excepted quantities (RID) : E2
Packing instructions (RID) : P001, IBC02, R001
Mixed packing provisions (RID) : MP19
Portable tank and bulk container instructions (RID) : T4
Portable tank and bulk container special provisions (RID) : TP1
Tank codes for RID tanks (RID) : LGBF
Transport category (RID) : 2
Colis express (express parcels) (RID) : CE7
Hazard identification number (RID) : 33

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable

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SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

EU restriction list (REACH Annex XVII)	
Reference code	Applicable on
3(a)	tetrahydrofuran
3(b)	tetrahydrofuran
40.	tetrahydrofuran

Tetrahydrofuran is not on the REACH Candidate List

Tetrahydrofuran is not on the REACH Annex XIV List

Tetrahydrofuran is not subject to Regulation (EU) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of hazardous chemicals.

Tetrahydrofuran is not subject to Regulation (EU) No 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants

Contains no substance subject to Regulation (EU) 2019/1148 of the European Parliament and of the Council of 20 June 2019 on the marketing and use of explosives precursors.

VOC content : 100 %

15.1.2. National regulations

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Not subject to reporting requirements of the United States SARA Section 313

France	
Occupational diseases	
Code	Description
RG 84	Conditions caused by liquid organic solvents for professional use: saturated or unsaturated aliphatic or cyclic liquid hydrocarbons and mixtures thereof; liquid halogenated hydrocarbons; nitrated derivatives of aliphatic hydrocarbons; alcohols; glycols, glycol ethers; ketones; aldehydes; aliphatic and cyclic ethers, including tetrahydrofuran; esters; dimethylformamide and dimethylacetamine; acetonitrile and propionitrile; pyridine; dimethylsulfone and dimethylsulfoxide

Germany

Water hazard class (WGK) : WGK 1, Slightly hazardous to water (Classification according to VwVwS, Annex 1 or 2)

Hazardous Incident Ordinance (12. BImSchV) : Is not subject of the Hazardous Incident Ordinance (12. BImSchV)

Netherlands

Waterbezwaarlijkheid : 11 - Weinig schadelijk voor in het water levende organismen

SZW-lijst van kankerverwekkende stoffen : The substance is not listed

SZW-lijst van mutagene stoffen : The substance is not listed

SZW-lijst van reprotoxische stoffen – Borstvoeding : The substance is not listed

SZW-lijst van reprotoxische stoffen – : The substance is not listed

Vruchtbaarheid

SZW-lijst van reprotoxische stoffen – Ontwikkeling : The substance is not listed

Denmark

Classification remarks : Emergency management guidelines for the storage of flammable liquids must be followed

Danish National Regulations : Young people below the age of 18 years are not allowed to use the product
Pregnant/breastfeeding women working with the product must not be in direct contact with the product

Switzerland

Storage class (LK) : LK 3 - Flammable liquids

15.2. Chemical safety assessment

A chemical safety assessment has been carried out

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SECTION 16: Other information

Data sources : REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.

Other information : None.

Full text of H- and EUH-statements:

Acute Tox. 4 (Oral)	Acute toxicity (oral), Category 4
Carc. 2	Carcinogenicity, Category 2
EUH019	May form explosive peroxides.
Eye Irrit. 2	Serious eye damage/eye irritation, Category 2
Flam. Liq. 2	Flammable liquids, Category 2
H225	Highly flammable liquid and vapour.
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.
STOT SE 3	Specific target organ toxicity — Single exposure, Category 3, Narcosis

Safety Data Sheet (SDS), EU

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