Tetrahydrofuran (THF)

Safety Data Sheet

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878
Issue date: 6/6/2022 Revision date: 4/12/2022 Version: 1.1 SDS number: P2022052312

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

1.1. Product identifier

Product form	:	Substance
Trade name	:	Tetrahydrofuran (THF)
Chemical name	:	Tetrahydrofuran
EC Index-No.	:	603-025-00-0
EC-No.	:	203-726-8
CAS-No.	:	109-99-9
Formula	:	C4H8O
REACH Registration Number	:	01-2119444314-46-0099

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

1.2.1. Relevant identified uses

Use of the substance/mixture : solvent for resins, reactant in preparation of polytetrahydrofuran

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Sahara International Petrochemical Company (Sipchem)
Saudi Arabia, Jubail Industrial City 31961, P.O Box 12021.
T 966 13 359 9999
complianceps@sipchem.com - https://www.sipchem.com

1.4. Emergency telephone number

T +966 13 359 9985 (24 × 7)

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, Respiratory tract irritation	H335

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

Adverse physicochemical, human health and environmental effects

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

2.2. Label elements

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

Hazard pictograms (CLP) :

GHS02 GHS07 GHS08

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.
H351 - Suspected of causing cancer.

Precautionary statements (CLP) : P201 - Obtain special instructions before use.
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P235 - Keep cool.
P280 - Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.
P370+P378 - In case of fire: Use media other than water to extinguish.
P403+P235 - Store in a well-ventilated place. Keep cool.

EUH-statements : EUH019 - May form explosive peroxides.

2.3. Other hazards

Contains no PBT/vPvB substances ≥ 0.1% assessed in accordance with REACH Annex XIII

The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605

SECTION 3: Composition/information on ingredients

3.1. Substances

Name : Tetrahydrofuran (THF)

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 Registration Number : 01-2119444314-46-0099	100%	Eye Irrit.2; H319: C ⩾ 25 % STOT SE 3; H335: C ⩾ 25 %

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible). IF exposed or concerned: Get medical advice/attention. Call a poison center or a doctor if you feel unwell.

First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing. Allow affected person to breathe fresh air. Allow the victim to rest. Call a poison center or a doctor if you feel unwell.

First-aid measures after skin contact	:	Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse. Rinse skin with water/shower. Take off immediately all contaminated clothing.
First-aid measures after eye contact	:	Rinse immediately with plenty of water. Obtain medical attention if pain, blinking or redness persists. Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
First-aid measures after ingestion	:	Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention. Call a poison center or a doctor if you feel unwell.

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

Symptoms/effects	:	Not expected to present a significant hazard under anticipated conditions of normal use.
Symptoms/effects after inhalation	:	May cause respiratory irritation.
Symptoms/effects after eye contact	:	Eye irritation.

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

Treat symptomatically.

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	:	On combustion forms: carbon oxides
Hazardous decomposition products in case of fire	:	Toxic fumes may be released.

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.
Protective equipment for firefighters	:	Do not enter fire area without proper protective equipment, including respiratory protection. Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Protective equipment	:	Wear recommended personal protective equipment. For further information refer to section 8: "Exposure controls/personal protection".
Emergency procedures	:	Ventilate spillage area. Evacuate unnecessary personnel. No open flames, no sparks, and no smoking. Avoid breathing dust/fume/gas/mist/vapours/spray. Avoid contact with skin and eyes.

6.1.2. For emergency responders

Protective equipment	:	Do not attempt to take action without suitable protective equipment. Equip cleanup crew with proper protection. For further information refer to section 8: "Exposure controls/personal protection".
Emergency procedures	:	Ventilate area.

6.2. Environmental precautions

Avoid release to the environment. 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

Methods for cleaning up : Take up liquid spill into absorbent material. Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Collect spillage. Store away from other materials. Notify authorities if product enters sewers or public waters.

Other information : Dispose of materials or solid residues at an authorized site.

6.4. Reference to other sections

For further information refer to section 8: "Exposure controls/personal protection". For disposal of residues refer to section 13 : "Disposal considerations".

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Provide good ventilation in process area to prevent formation of vapour. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Ground/bond container and receiving equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Flammable vapours may accumulate in the container. Use explosion-proof equipment. Wear personal protective equipment. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use only outdoors or in a well-ventilated area. Avoid breathing dust/fume/gas/mist/vapours/spray. Avoid contact with skin and eyes.

Hygiene measures : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Ground/bond container and receiving equipment.

Storage conditions : Keep container tightly closed in a cool, well-ventilated place. Keep container closed when not in use. Store in a well-ventilated place. Keep cool. Keep container tightly closed. Store locked up.

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)	
Local name	Tetrahydrofuran
IOEL TWA	150 mg/m³
IOEL STEL	300 mg/m³
IOEL STEL [ppm]	100 ppm
Remark	Skin
Regulatory reference	COMMISSION DIRECTIVE 2000/39/EC
Austria - Occupational Exposure Limits	
Local name	Tetrahydrofuran

Tetrahydrofuran (109-99-9)	
MAK (OEL TWA)	150 mg/m³
MAK (OEL TWA) [ppm]	50 ppm
MAK (OEL STEL)	300 mg/m³
MAK (OEL STEL) [ppm]	100 ppm
Remark	H. Krebserzeugend: III B
OEL chemical category	Skin notation, Group B Carcinogen
Regulatory reference	BGBl. II Nr. 238/2018
Belgium - Occupational Exposure Limits	
Local name	Tétrahydrofurane # Tetrahydrofuraan
OEL TWA	150 mg/m³
OEL TWA [ppm]	50 ppm
OEL STEL	300 mg/m³
OEL STEL [ppm]	100 ppm
Remark	D: la mention “D” signifie que la résorption de l’agent, via la peau, les muqueuses ou les yeux, constitue une partie importante de l’exposition totale. Cette résorption peut se faire tant par contact direct que par présence de l’agent dans l’air. # D: de vermelding “D” betekent dat de opname van het agens via de huid, de slijmvliezen of de ogen een belangrijk deel van de totale blootstelling vormt. Deze opname kan het gevolg zijn van zowel direct contact als zijn aanwezigheid in de lucht.
OEL chemical category	Skin, Skin notation
Regulatory reference	Koninklijk besluit/Arrêté royal 11/05/2021
Bulgaria - Occupational Exposure Limits	
Local name	Тетрахидрофуран
OEL TWA	150 mg/m³
OEL TWA [ppm]	50 ppm
OEL STEL	300 mg/m³
OEL STEL [ppm]	100 ppm
Remark	Кожа (възможна е значителна резорбция чрез кожата); • (Химични агенти, за които са определени гранични стойности във въздуха на работната среда за Европейската общност)
Regulatory reference	Наредба № 13 от 30.12.2003 г. за защита на работещите от рискове, свързани с експозиция на химични агенти при работа (изм. и доп. ДВ. бр. 47 от 2021 г., в сила от 04.06.2021 г.)
Croatia - Occupational Exposure Limits	
Local name	Tetrahidrofuran
GVI (OEL TWA) [1]	150 mg/m³
GVI (OEL TWA) [2]	50 ppm
KGVI (OEL STEL)	300 mg/m³
KGVI (OEL STEL) [ppm]	100 ppm
Remark	Direktiva: 2000/39/EZ. Napomena: Koža (razvrstana kao tvar koja nadražuje kožu (H315))

Tetrahydrofuran (109-99-9)	
OEL chemical category	Skin notation
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 1/2021)
Croatia - Biological limit values	
Local name	Tetrahidrofuran
BLV	2 mg/l Parameter: Tetrahydrofuran - Medium: urine - Sampling time: at the end of the work shift
Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 91/2018)
Cyprus - Occupational Exposure Limits	
OEL TWA	150 mg/m³
OEL TWA [ppm]	50 ppm
OEL STEL	300 mg/m³
OEL STEL [ppm]	100 ppm
OEL chemical category	Skin-potential for cutaneous absorption
Czech Republic - Occupational Exposure Limits	
Local name	Tetrahydrofuran
PEL (OEL TWA)	150 mg/m³
PEL (OEL TWA) [ppm]	50 ppm
NPK-P (OEL C)	300 mg/m³
NPK-P (OEL C) [ppm]	100 ppm
Remark	D - při expozici se významně uplatňuje pronikání faktoru kůží, I - dráždí sliznice (oči, dýchací cesty), respektive kůži.
OEL chemical category	Potential for cutaneous absorption
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (Předpis 195/2021 Sb.)
Denmark - Occupational Exposure Limits	
Local name	Tetrahydrofuran
OEL TWA [1]	150 mg/m³
OEL TWA [2]	50 ppm
Remark	E (betyder, at stoffet har en EF-grænseværdi); H (betyder, at stoffet kan optages gennem huden)
OEL chemical category	Potential for cutaneous absorption
Regulatory reference	BEK nr 2203 af 29. november 2021
Estonia - Occupational Exposure Limits	
Local name	Tetrahüdrofuraan
OEL TWA	150 mg/m³
OEL TWA [ppm]	50 ppm
OEL STEL	300 mg/m³

Tetrahydrofuran (109-99-9)	
OEL STEL [ppm]	100 ppm
Remark	A (Naha kaudu kergesti imenduv aine), S (Sensibiliseeriv aine)
OEL chemical category	Skin notation, Sensitizer
Regulatory reference	Vabariigi Valitsuse 20. märtsi 2001. a määruse nr 105 (RT I, 15.05.2021, 1)
Finland - Occupational Exposure Limits	
Local name	Tetrahydrofuraani
HTP (OEL TWA) [1]	150 mg/m³
HTP (OEL TWA) [2]	50 ppm
HTP (OEL STEL)	300 mg/m³
HTP (OEL STEL) [ppm]	100 ppm
Remark	Iho
OEL chemical category	Potential for cutaneous absorption
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveysministeriö)
France - Occupational Exposure Limits	
Local name	Tétrahydrofurane
VME (OEL TWA)	150 mg/m³
VME (OEL TWA) [ppm]	50 ppm
VLE (OEL C/STEL)	300 mg/m³
VLE (OEL C/STEL) [ppm]	100 ppm
Remark	Valeurs règlementaires contraignantes; risque de pénétration percutanée
OEL chemical category	Carcinogen category 2, Risk of cutaneous absorption
Regulatory reference	Article R4412-149 du Code du travail (réf.: INRS ED 984, 2016; Décret n° 2019-1487; Décret n° 2020-1546; Décret n° 2021-434; Décret n° 2021-1849)
Germany - Occupational Exposure Limits (TRGS 900)	
AGW (OEL TWA) [1]	150 mg/m³ (the risk of damage to the embryo or fetus can be excluded when AGW and BGW values are observed)
AGW (OEL TWA) [2]	50 ppm (the risk of damage to the embryo or fetus can be excluded when AGW and BGW values are observed)
Peak exposure limitation factor	2(I)
Remark	DFG - Senatskommission zur Prüfung gesundheitsschädlicher Arbeitsstoffe der DFG (MAK-Kommission); EU - Europäische Union (Von der EU wurde ein Luftgrenzwert festgelegt: Abweichungen bei Wert und Spitzenbegrenzung sind möglich); H - hautresorptiv; Y - Ein Risiko der Fruchtschädigung braucht bei Einhaltung des Arbeitsplatzgrenzwertes und des biologischen Grenzwertes (BGW) nicht befürchtet zu werden
Chemical category	Skin notation
Regulatory reference	TRGS900
Germany - Biological limit values (TRGS 903)	
Local name	Tetrahydrofuran

Tetrahydrofuran (109-99-9)	
Biological limit value	2 mg/l Parameter: Tetrahydrofuran - Medium: urine - Sampling time: end of shift
Regulatory reference	TRGS 903
Greece - Occupational Exposure Limits	
Local name	Τετραϋδρο-φουρανίου
OEL TWA	590 mg/m³
OEL TWA [ppm]	200 ppm
OEL STEL	735 mg/m³
OEL STEL [ppm]	250 ppm
Regulatory reference	Π.Δ. 90/1999 - Προστασία της υγείας των εργαζομένων που εκτίθενται σε ορισμένους χημικούς παράγοντες κατά τη διάρκεια της εργασίας τους
Hungary - Occupational Exposure Limits	
Local name	Tetrahidrofurán
AK (OEL TWA)	150 mg/m³
CK (OEL STEL)	300 mg/m³
Remark	b (Bőrön át is felszívódik), i (ingerlő anyag, amely izgatja a bőrt, nyálkahártyát, szemet vagy mindhármat); EU1 (2000/39/EK irányelvben közölt érték); N (Irritáló anyagok, egyszerű fojtógázok, csekély egészségkárosító hatással bíró anyagok)
OEL chemical category	Potential for cutaneous absorption
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről
Ireland - Occupational Exposure Limits	
Local name	Tetrahydrofuran
OEL TWA [1]	150 mg/m³
OEL TWA [2]	50 ppm
OEL STEL	300 mg/m³
OEL STEL [ppm]	100 ppm
Remark	Sk (Substances which have the capacity to penetrate intact skin when they come in contact with it, and be absorbed into the body), IOELV (Indicative Occupational Exposure Limit Values)
OEL chemical category	Potential for cutaneous absorption
Regulatory reference	Chemical Agents Code of Practice 2021
Italy - Occupational Exposure Limits	
Local name	Tetraidrofurano
OEL TWA	150 mg/m³
OEL TWA [ppm]	50 ppm
OEL STEL	300 mg/m³
OEL STEL [ppm]	100 ppm
Remark	Cute

Tetrahydrofuran (109-99-9)	
OEL chemical category	skin - potential for cutaneous absorption
Regulatory reference	Allegato XXXVIII del D.Lgs. 9 aprile 2008, n. 81 e s.m.i.
Latvia - Occupational Exposure Limits	
Local name	Tetrahidrofurāns
OEL TWA	150 mg/m³
OEL TWA [ppm]	50 ppm
OEL STEL	300 mg/m³
OEL STEL [ppm]	100 ppm
Remark	Āda
OEL chemical category	skin - potential for cutaneous exposure
Regulatory reference	Ministru kabineta 2007. gada 15. maija noteikumiem Nr. 325
Lithuania - Occupational Exposure Limits	
Local name	Tetrahidrofuranas
IPRV (OEL TWA)	150 mg/m³
IPRV (OEL TWA) [ppm]	50 ppm
TPRV (OEL STEL)	300 mg/m³
TPRV (OEL STEL) [ppm]	100 ppm
Remark	O (medžiaga į organizmą gali prasiskverbti pro nepažeistą odą)
OEL chemical category	Skin notation
Regulatory reference	LIETUVOS HIGIENOS NORMA HN 23:2011 (Nr. V-695/A1-272, 2018-06-12)
Luxembourg - Occupational Exposure Limits	
Local name	Tétrahydrofurane
OEL TWA	150 mg/m³
OEL TWA [ppm]	50 ppm
OEL STEL	300 mg/m³
OEL STEL [ppm]	100 ppm
OEL chemical category	Possibility of significant uptake through the skin
Remark	Peau
Regulatory reference	Mémorial A Nº 226 de 2021 concernant la protection de la sécurité et de la santé des salariés contre les risques liés à des agents chimiques sur le lieu de travail
Malta - Occupational Exposure Limits	
Local name	Tetrahydrofuran
OEL TWA	150 mg/m³
OEL TWA [ppm]	50 ppm
OEL STEL	300 mg/m³
OEL STEL [ppm]	100 ppm

Tetrahydrofuran (109-99-9)	
Remark	Skin # Ġilda
OEL chemical category	Possibility of significant uptake through the skin
Regulatory reference	S.L.424.24 - Chemical Agents at Work Regulations (L.N.356 of 2021)
Netherlands - Occupational Exposure Limits	
Local name	Tetrahydrofuraan
TGG-8u (OEL TWA)	300 mg/m³
TGG-15min (OEL STEL)	600 mg/m³
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 H-aanduiding. Bij deze stoffen moeten naast maatregelen tegen inademing ook adequate maatregelen ter voorkoming van huidcontact worden genomen.
MAC chemical category	Skin notation
Regulatory reference	Arbeidsomstandighedenregeling 2022
Poland - Occupational Exposure Limits	
Local name	Tetrahydrofuran
NDS (OEL TWA)	150 mg/m³
NDSCh (OEL STEL)	300 mg/m³
Remark	Skóra (Oznakowanie substancji notacją „skóra” oznacza, że wchłanianie substancji przez skórę może być tak samo istotne jak przy narażeniu drogą oddechową).
Regulatory reference	Dz. U. 2018 poz. 1286
Portugal - Occupational Exposure Limits	
Local name	Tetra-hidrofurano
OEL TWA	150 mg/m³ (indicative limit value)
OEL TWA [ppm]	50 ppm (indicative limit value)
OEL STEL	300 mg/m³ (indicative limit value)
OEL STEL [ppm]	100 ppm (indicative limit value)
OEL chemical category	A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans, skin - potential for cutaneous exposure indicative limit value
Remark	P (Toxicidade percutânea); A3 (Agente carcinogénico confirmado nos animais de laboratorio con relevância desconhecida no Homem)
Regulatory reference	Norma Portuguesa NP 1796:2014
Portugal - Biological Exposure Indices	
Local name	Tetrahidrofurano
BEI	2 mg/l Parâmetro: Tetrahidrofurano - Meio: urina - Momento da amostragem: Fim do turno
Regulatory reference	Norma Portuguesa NP 1796:2014
Romania - Occupational Exposure Limits	
Local name	Tetrahidrofuran

Tetrahydrofuran (109-99-9)	
OEL TWA	150 mg/m³
OEL TWA [ppm]	50 ppm
OEL STEL	300 mg/m³
OEL STEL [ppm]	100 ppm
OEL chemical category	C2, Skin notation
Remark	P - posibilitatea unei penetrări cutanate importante; C2 - susceptibil de a provoca apariția cancerului
Regulatory reference	Hotărârea Guvernului nr. 1.218/2006 (Hotărârea nr. 53/2021)
Slovakia - Occupational Exposure Limits	
Local name	Tetrahydrofurán
NPHV (OEL TWA) [1]	150 mg/m³
NPHV (OEL TWA) [2]	50 ppm
NPHV (OEL STEL)	300 mg/m³
NPHV (OEL STEL) [ppm]	100 ppm
NPHV (OEL C)	300 mg/m³
Remark	K - znamená, že faktor môže byť ľahko absorbovaný kožou
OEL chemical category	Potential for cutaneous absorption
Regulatory reference	Nariadenie vlády č. 355/2006 Z. z. (236/2020 Z. z.)
Slovakia - Biological limit values	
Local name	Tetrahydrofurán
BLV	2 mg/l Parameter: Tetrahydrofuran - Medium: urine - Sampling time: end of exposure or work shift
Regulatory reference	Nariadenie vlády č. 355/2006 Z. z. (Zmena: 471/2011 Z.z.)
Slovenia - Occupational Exposure Limits	
Local name	Tetrahidrofuran
OEL TWA	150 mg/m³
OEL TWA [ppm]	50 ppm
OEL STEL	300 mg/m³
OEL STEL [ppm]	100 ppm
Remark	K (Lastnost lažjega prehajanja snovi v organizem skozi kožo), Y (Snovi, pri katerih ni nevarnosti za zarodek ob upoštevanju mejnih vrednosti in bat vrednosti), BAT (Biološka mejna vrednost), EU
OEL chemical category	Category 2, Potential for cutaneous absorption
Regulatory reference	Uradni list RS, št. 72/2021 z dne 11.5.2021
Slovenia - Biological limit values	
Local name	Tetrahidrofuran
BLV	2 mg/l Parameter: tetrahidrofuran - Biološki vzorec: urin - Čas vzorčenja: ob koncu delovne izmene
Regulatory reference	Uradni list RS, št. 72/2021 z dne 11.5.2021

Tetrahydrofuran (109-99-9)	
Spain - Occupational Exposure Limits	
Local name	Tetrahidrofurano
VLA-ED (OEL TWA) [1]	150 mg/m³ (indicative limit value)
VLA-ED (OEL TWA) [2]	50 ppm (indicative limit value)
VLA-EC (OEL STEL)	300 mg/m³
VLA-EC (OEL STEL) [ppm]	100 ppm
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), VLI (Agente químico para el que la U.E. estableció en su día un valor límite indicativo), VLB® (Agente químico que tiene Valor Límite Biológico).
OEL chemical category	skin - potential for cutaneous absorption
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2022. INSHT
Spain - Biological limit values	
Local name	Tetrahidrofurano
BLV	2 mg/l Parameter: Tetrahydrofuran - Medium: urine - Sampling time: end of shift
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2022. INSHT
Sweden - Occupational Exposure Limits	
Local name	Tetrahydrofuran (THF)
NGV (OEL TWA)	150 mg/m³
NGV (OEL TWA) [ppm]	50 ppm
KTV (OEL STEL)	300 mg/m³
KTV (OEL STEL) [ppm]	100 ppm
Regulatory reference	Hygieniska gränsvärden (AFS 2018:1)
United Kingdom - Occupational Exposure Limits	
Local name	Tetrahydrofuran
WEL TWA (OEL TWA) [1]	150 mg/m³
WEL TWA (OEL TWA) [2]	50 ppm
WEL STEL (OEL STEL)	300 mg/m³
WEL STEL (OEL STEL) [ppm]	100 ppm
Remark	Sk (Can be absorbed through the skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity)
WEL chemical category	Potential for cutaneous absorption
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE
Iceland - Occupational Exposure Limits	
Local name	Tetrahýdrófúran
OEL TWA	150 mg/m³

Tetrahydrofuran (109-99-9)	
OEL TWA [ppm]	50 ppm
OEL STEL	300 mg/m³
OEL STEL [ppm]	100 ppm
Remark	H (efnið getur auðveldlega borist inn í líkamann gegnum húð)
Regulatory reference	Reglugerð um mengunarmörk og aðgerðir til að draga úr mengun á vinnustöðum (Nr. 390/2009)
Norway - Occupational Exposure Limits	
Local name	Tetrahydrofuran
Grenseverdi (OEL TWA) [1]	150 mg/m³
Grenseverdi (OEL TWA) [2]	50 ppm
Korttidsverdi (OEL STEL)	187.5 mg/m³ (value calculated)
Korttidsverdi (OEL STEL) [ppm]	75 ppm (value calculated)
Remark	H: Kjemikalier som kan tas opp gjennom huden; E: EU har en veiledende grenseverdi og/eller anmerkning for stoffet.
OEL chemical category	Skin notation
Regulatory reference	FOR-2021-06-28-2248
Switzerland - Occupational Exposure Limits	
Local name	Tétrahydrofurane (THF) / Tetrahydrofuran (THF)
MAK (OEL TWA) [1]	150 mg/m³
MAK (OEL TWA) [2]	50 ppm
KZGW (OEL STEL)	300 mg/m³
KZGW (OEL STEL) [ppm]	100 ppm
Critical toxicity	Rein, VRS, SNC / Niere, OAW, ZNS
Notation	R, SS_C, B / H, SS_C, B
Remark	INRS, NIOSH
OEL chemical category	Skin notation
Regulatory reference	www.suva.ch, 01.01.2021
Switzerland - BAT	
BAT	2 mg/l Parameter: Tetrahydrofuran - Medium: urine - Sampling time: end of shift

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

Ingredient	DNELs Exposure Pattern Worker	PNECs Compartment
Tetrahydrofuran	Dermal 12.6 mg/kg bw/day (Systemic, Chronic) Inhalation 72.4 mg/m³ (Systemic, Chronic) Inhalation 150 mg/m³ (Local, Chronic) Inhalation 96 mg/m³ (Systemic, Acute) Inhalation 300 mg/m³ (Local, Acute) Dermal 1.5 mg/kg bw/day (Systemic, Chronic) * Inhalation 13 mg/m³ (Systemic, Chronic) * Oral 1.5 mg/kg bw/day (Systemic, Chronic) * Inhalation 75 mg/m³ (Local, Chronic) * Inhalation 52 mg/m³ (Systemic, Acute) * Inhalation 150 mg/m³ (Local, Acute) *	4.32 mg/L (Water (Fresh)) 0.432 mg/L (Water - Intermittent release) 21.6 mg/L (Water (Marine)) 23.3 mg/kg sediment dw (Sediment (Fresh Water)) 2.33 mg/kg sediment dw (Sediment (Marine)) 2.13 mg/kg soil dw (Soil) 4.6 mg/L (STP) 67 mg/kg food (Oral)

* Values for General Population

8.1.5. Control banding

No additional information available

8.2. Exposure controls

8.2.1. Appropriate engineering controls

Appropriate engineering controls:
Ensure good ventilation of the work station.

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. Use eye protection according to EN 166. Safety glasses

8.2.2.2. Skin protection

Skin and body protection:
Wear suitable protective clothing

Hand protection:
Wear protective gloves. Wear suitable gloves tested to EN374

8.2.2.3. Respiratory protection

Respiratory protection:
Wear appropriate mask

8.2.2.4. Thermal hazards

No additional information available

8.2.3. Environmental exposure controls

Environmental exposure controls:
Avoid release to the environment.

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
Colour	:	Colourless.
Odour	:	Sweet.
Odour threshold	:	20 – 50 ppm
Melting point	:	-108 °C
Freezing point	:	Not available
Boiling point	:	67 °C
Flammability	:	Highly flammable.
Lower explosion limit	:	2 vol %
Upper explosion limit	:	11.8 vol %
Flash point	:	-14
Auto-ignition temperature	:	321 °C
Decomposition temperature	:	Not available
pH	:	Not available
Viscosity, kinematic	:	Not available
Viscosity, dynamic	:	0.5 cP @20 °C
Solubility	:	Not available
Partition coefficient n-octanol/water (Log Kow)	:	Not available
Partition coefficient n-octanol/water (Log Pow)	:	0.45
Vapour pressure	:	145 mm Hg @20 °C
Vapour pressure at 50 °C	:	Not available
Density	:	Not available
Relative density	:	0.8892
Relative vapour density at 20 °C	:	2.5
Particle characteristics	:	Not applicable

9.2. Other information

9.2.1. Information with regard to physical hazard classes

No additional information available

9.2.2. Other safety characteristics

Relative evaporation rate (butylacetate=1)	:	14.5

SECTION 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 comingled 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

Carbon Oxides.

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

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
LD50 dermal rat	> 2000 mg/kg
LC50 Inhalation - Rat	> 14.7 mg/l/4h

Skin corrosion/irritation : Rabbit: not irritating
Serious eye damage/irritation : Causes serious eye irritation.
Respiratory or skin sensitisation : Skin mouse : not sensitising [OECD 429]
Germ cell mutagenicity : Mouse: negative [OECD 474]
Chinese hamster Ovary (CHO) : negative [OECD 476]
Carcinogenicity : Suspected of causing cancer.

Tetrahydrofuran (109-99-9)

IARC group 2B - Possibly carcinogenic to humans

Reproductive toxicity : Not classified
STOT-single exposure : May cause respiratory irritation.
STOT-repeated exposure : Not classified
Aspiration hazard : Not classified

11.2. Information on other hazards

11.2.1. Endocrine disrupting properties

No additional information available

11.2.2. Other information

Other information : Likely routes of exposure: ingestion, inhalation, skin and eye

SECTION 12: Ecological information

12.1. Toxicity

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	1970 – 2360 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
LC50 - Fish	2700 – 3600 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])
EC50 - aquatic invertebrates	5930 mg/L (24hr, Daphnia magna))

12.2. Persistence and degradability

Tetrahydrofuran (THF) (109-99-9)

Persistence and degradability	Not readily biodegradable 39% (OECD 301D)

12.3. Bioaccumulative potential

Tetrahydrofuran (THF) (109-99-9)

Partition coefficient n-octanol/water (Log Pow)	0.45

12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

No additional information available

12.6. Endocrine disrupting properties

No additional information available

12.7. Other adverse effects

Additional information : Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Dispose of contents/container in accordance with licensed collector's sorting instructions.
Product/Packaging disposal recommendations : Dispose in a safe manner in accordance with local/national regulations.
Additional information : Flammable vapours may accumulate in the container.
Ecology - waste materials : Avoid release to the environment.

SECTION 14: Transport information

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

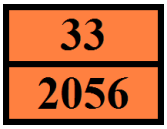
ADR	IMDG	IATA	ADN	RID
14.1. UN number or ID number				
UN 2056	UN 2056	UN 2056	UN 2056	UN 2056
14.2. UN proper shipping name				
Tetrahydrofuran	Tetrahydrofuran	Tetrahydrofuran	Tetrahydrofuran	Tetrahydrofuran
Transport document description				
UN 2056 Tetrahydrofuran, 3, II, (D/E)	UN 2056 Tetrahydrofuran, 3, II (< -18°C c.c.)	UN 2056 Tetrahydrofuran, 3, II	UN 2056 Tetrahydrofuran, 3, II	UN 2056 Tetrahydrofuran, 3, II
14.3. Transport hazard class(es)				
3	3	3	3	3
				

ADR	IMDG	IATA	ADN	RID
14.4. Packing group				
II	II	II	II	II
14.5. Environmental hazards				
Dangerous for the environment: No	Dangerous for the environment: No Marine pollutant: No	Dangerous for the environment: No	Dangerous for the environment: No	Dangerous for the environment: No

No supplementary information available

14.6. Special precautions for user

Overland transport

Classification code (ADR)	:	F1
Limited quantities (ADR)	:	1l
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
Special provisions for carriage - Operation (ADR)	:	S2, S20
Hazard identification number (Kemler No.)	:	33
Orange plates	:	
Tunnel restriction code (ADR)	:	D/E

Transport by sea

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

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

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. Maritime transport in bulk according to IMO instruments

Not applicable

SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

No REACH Annex XVII restrictions
Tetrahydrofuran (THF) is not on the REACH Candidate List
Tetrahydrofuran (THF) is not on the REACH Annex XIV List
Tetrahydrofuran (THF) 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 (THF) 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
Tetrahydrofuran (THF) is not subject to REGULATION (EU) No 1005/2009 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 September 2009 on substances that deplete the ozone layer.
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.
Contains no substance subject to Regulation (EC) 273/2004 of the European Parliament and of the Council of 11 February 2004 on the manufacture and the placing on market of certain substances used in the illicit manufacture of narcotic drugs and psychotropic substances.

15.1.2. National regulations

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

Employment restrictions	:	Observe restrictions according Act on the Protection of Working Mothers (MuSchG) Observe restrictions according Act on the Protection of Young People in Employment (JArbSchG)
Water hazard class (WGK)	:	WGK 1, Slightly hazardous to water (Classification according to VwVwS, Annex 1 or 2; ID No. 190)
Hazardous Incident Ordinance (12. BImSchV)	:	Is not subject of the Hazardous Incident Ordinance (12. BImSchV)

Netherlands

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 – Vruchtbaarheid	:	The substance is not listed
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 under 18 years are not allowed to use the product Pregnant/breastfeeding women working with the product must not be in direct contact with it The requirements from the Danish Working Environment Authorities regarding work with carcinogens must be followed during use and disposal

Switzerland

Storage class (LK)	:	LK 3 - Flammable liquids
Chemicals Ordinance (SR 813.11)	:	Group 2

15.2. Chemical safety assessment

No chemical safety assessment has been carried out

SECTION 16: Other information

Abbreviations and acronyms:	
AND	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE	Acute Toxicity Estimate
BCF	Bioconcentration factor
BLV	Biological limit value
BOD	Biochemical oxygen demand (BOD)
COD	Chemical oxygen demand (COD)
DMEL	Derived Minimal Effect level
DNEL	Derived-No Effect Level
EC-No.	European Community number
EC50	Effective concentration for 50 percent of test population (median effective concentration)
EN	European Standard
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
LC50	Lethal concentration for 50 percent of test population (median lethal concentration)

Abbreviations and acronyms:	
LD50	Lethal dose for 50 percent of test population (median lethal dose)
LOAEL	Lowest Observed Adverse Effect Level
NOAEC	No-Observed Adverse Effect Concentration
NOAEL	No-Observed Adverse Effect Level
NOEC	No-Observed Effect Concentration
OECD	Organisation for Economic Co-operation and Development
OEL	Occupational Exposure Limit
PBT	Persistent Bioaccumulative Toxic
PNEC	Predicted No-Effect Concentration
RID	Regulation concerning the International Carriage of Dangerous Goods by Railways
SDS	Safety Data Sheet
STP	Sewage treatment plant
ThOD	Theoretical oxygen demand (ThOD)
TLM	Median Tolerance Limit
VOC	Volatile Organic Compounds
CAS-No.	Chemical Abstract Service number
N.O.S.	Not Otherwise Specified
vPvB	Very Persistent and Very Bioaccumulative
ED	Endocrine disrupting properties

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.
H351	Suspected of causing cancer.
STOT SE 3	Specific target organ toxicity – Single exposure, Category 3, Respiratory tract irritation

Safety Data Sheet (SDS), EU

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.