



THF (TETRAHIDROFURANO)



Version: 2

Revision: 29/03/2023

Previous revision: 28/03/2023

Date of printing: 29/03/2023

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1	PRODUCT IDENTIFIER: THF (TETRAHIDROFURANO) (CAS: 109-99-9 EC: 203-726-8) UFI: K810-X01F-F00F-YT84 REACH REGISTER: <u>Register name:</u> Tetrahydrofuran <u>Register number:</u> 01-2119444314-46
1.2	RELEVANT IDENTIFIED USES OF THE SUBSTANCE OR MIXTURE AND USES ADVISED AGAINST: <u>Intended uses (main technical functions):</u> ☐ Industrial ☒ Professional ☐ Consumers Solvent. <u>Sectors of use (use as such or as an ingredient in mixtures):</u> Industrial manufacturing (SU3). Industrial. Printing and reproduction of recorded media (SU7). Industrial, Professional. Manufacture of bulk, large scale chemicals (SU8). Industrial. Manufacture of fine chemicals (SU9). Industrial. Health services (SU20). Industrial, Professional, Consumers. Consumer uses (SU21). Consumers. <u>Use in manufacture, formulation or application processes (relevant uses):</u> Manufacture of the substance, Industrial. Distribution of the substance, Industrial. Use as monomer in the production of polymers, Industrial. Use as process solvent, Industrial. Formulation of mixtures and/or re-packaging, Industrial. Use in coatings, Industrial, Professional, Consumers. Use in metal working fluids, Industrial, Professional. Use in functional fluids, Industrial, Professional. Use as a fuel, Industrial, Professional, Consumers. Use in cleaning agents, Industrial, Professional, Consumers. Use in laboratory, Industrial, Professional. <u>Use in products (relevant product categories):</u> Adhesives, sealants (PC1). Air care products (PC3). Anti-freeze and de-icing products (PC4). Coatings and paints, thinners, paint removers (PC9a). Fillers, putties, plasters, modelling clay (PC9b). Finger paints (PC9c). Fuels (PC13). Ink and toners (PC18). Intermediate (PC19). Laboratory chemicals (PC21). Leather tanning, dye, finishing, impregnation, leather care products (PC23). Lubricants, greases, release products (PC24). Pharmaceuticals (PC29). Polishes and wax blends (PC31). Polymer preparations and compounds (PC32). Washing and cleaning products (PC35). <u>Uses advised against:</u> This product is not recommended for any use or sector of use (industrial, professional or consumer) other than those previously listed as "Intended or identified uses". <u>Restrictions on manufacture, placing on market and use, according to Annex XVII of Regulation (EC) No. 1907/2006:</u> Not restricted.
1.3	DETAILS OF THE SUPPLIER OF THE SAFETY DATA SHEET: DANOSA - DERIVADOS ASFÁLTICOS NORMALIZADOS, S.A. Polígono Industrial, Sector 9 - 19290 Fontanar (Guadalajara) ESPAÑA Phone number: 949888210 - Fax: 949 888 223 - www.danosa.com <u>- E-mail address of the person responsible for the Safety Data Sheet:</u> info@danosa.com
1.4	EMERGENCY TELEPHONE NUMBER: 902 422 452 8:30-17:30 h

SECTION 2 : HAZARDS IDENTIFICATION

2.1

CLASSIFICATION OF THE SUBSTANCE OR MIXTURE:
[Classification in accordance with Regulation \(EU\) No. 1272/2008~2021/849 \(CLP\):](#)
DANGER:Flam. Liq. 2:H225|Acute Tox. (oral) 4:H302|Eye Irrit. 2:H319|Carc. 2:H351|STOT SE (irrit.) 3:H335|EUH019

Danger class	Classification of the substance	Cat.	Routes of exposure	Target organs	Effects
Physicochemical: 	Flam. Liq. 2:H225 EUH019:EUH019	Cat.2 -	- -	- -	- -
Human health:  	Acute Tox. (oral) 4:H302 Eye Irrit. 2:H319 Carc. 2:H351 STOT SE (irrit.) 3:H335	Cat.4 Cat.2 Cat.2 Cat.3	Ingestion Eyes - Inhalation	- Eyes - Respiratory tract	Harmful Irritation Cancer Irritation
Environment: Not classified					

Full text of hazard statements mentioned is indicated in section 16.



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2.2

LABEL ELEMENTS:

This product is labelled with the signal word DANGER in accordance with Regulation (EU) No. 1272/2008~2021/849 (CLP)

- Hazard statements:

H225 Highly flammable liquid and vapour.
 H351 Suspected of causing cancer.
 H302 Harmful if swallowed.
 H319 Causes serious eye irritation.
 H335 May cause respiratory irritation.
 EUH019 May form explosive peroxides.

- Precautionary statements:

P102 Keep out of reach of children.
 P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
 P243 Take action to prevent static discharges.
 P337+P313 If eye irritation persists: Get medical advice/attention.
 P280 Wear protective gloves, clothing and eye protection. In case of inadequate ventilation wear respiratory protection.
 P301+P312 IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell.
 P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]
 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.
 P310 Continue rinsing. Immediately call a POISON CENTER or doctor.
 P501 Dispose of contents/container to hazardous or special waste collection point.

- Supplementary statements:

None

- Substances that contribute to classification:

Tetrahydrofuran (EC No. 203-726-8)

2.3

OTHER HAZARDS:

Hazards which do not result in classification but which may contribute to the overall hazards of the substance:

- Other physicochemical hazards:

Vapours may form with air a mixture potentially flammable or explosive.

- Other adverse human health effects:

Prolonged exposure to vapours may produce transient drowsiness. Prolonged contact may cause skin dryness.

- Other negative environmental effects:

Do not fulfil the PBT/vPvB criteria.

Endocrine disrupting properties:

This product does not contain substances with endocrine disrupting properties identified or under evaluation.



Building together

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SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1

SUBSTANCES:

This product is a mono constituent substance.

[Chemical description:](#)

Tetrahydrofuran

INGREDIENTS:

100%	   Tetrahydrofuran CAS: 109-99-9, EC: 203-726-8, REACH: 01-2119444314-46 CLP: Danger: Flam. Liq. 2:H225 Acute Tox. (oral) 4:H302 Eye Irrit. 2:H319 Carc. 2:H351 STOT SE (irrit.) 3:H335 EUH019	REACH	Eye Irrit. 2, H319: C ≥25 % STOT SE (irrit.) 3, H335: C ≥25 %
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Impurities:

Does not contain other components or impurities which will influence the classification of the product.

Stabilizers:

None.

Reference to other sections:

For more information on hazardous ingredients, see sections 8, 11, 12 and 16.

SUBSTANCES OF VERY HIGH CONCERN (SVHC):

List updated by ECHA on 17/01/2023.

Substances SVHC subject to authorisation, included in Annex XIV of Regulation (EC) no. 1907/2006:

None.

Substances SVHC candidate to be included in Annex XIV of Regulation (EC) no. 1907/2006:

None.

Persistent, bioaccumulable and toxic PBT, or very persistent and very bioaccumulable vPvB substances:

Do not fulfil the PBT/vPvB criteria.

3.2

MIXTURES:

Not applicable (substance).

SECTION 4: FIRST AID MEASURES

4.1



Symptoms may occur after exposure, so that in case of direct exposure to the product, when in doubt, or when symptoms persist, seek medical attention. Never give anything by mouth to an unconscious person. Lifeguards should pay attention to self-protection and use the recommended protective equipment if there is a possibility of exposure. Wear protective gloves when administering first aid.

Route of exposure	Symptoms and effects, acute and delayed	Description of first-aid measures
Inhalation: 	The vapours may be irritant and cause dizziness, headache, nausea, vomiting and narcosis.	Remove the patient out of the contaminated area into the fresh air. If breathing is irregular or stops, administer artificial respiration. If the person is unconscious, place in appropriate recovery position. Keep the patient warm and at rest until medical attention arrives.
Skin: 	Prolonged contact may cause skin dryness.	Remove immediately contaminated clothing. Wash thoroughly the affected area with plenty of cold or lukewarm water and neutral soap, or use a suitable skin cleanser.
Eyes: 	Contact with the eyes produces redness and pain.	Rinse eyes copiously by irrigation with plenty of clean, fresh water for at least 15 minutes, holding the eyelids apart, until the irritation is reduced. Remove contact lenses after the first 1-2 minutes and continue washing for a few minutes. Obtain medical attention without delay, preferably from an ophthalmologist.
Ingestion: 	If swallowed, may cause irritation of the throat, abdominal pain, drowsiness, nausea, vomiting and diarrhoea.	If swallowed, seek immediate medical attention. Wash out the mouth, then drink plenty of water. Do not induce vomiting, unless directed to do so by medical personnel. Keep the patient at rest.

4.2

MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE AND DELAYED:

The main symptoms and effects are indicated in sections 4.1 and 11.1

4.3

INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED:

Notes to physician:

Treatment should be directed at the control of symptoms and the clinical condition of the patient.

Antidotes and contraindications:

There is no specific antidote.



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SECTION 5: FIREFIGHTING MEASURES

- 5.1 EXTINGUISHING MEDIA:
Extinguishing powder or CO₂.
- 5.2 SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE:
Highly flammable liquid and vapour. Decomposes violently when heated intensely. As consequence of combustion or thermal decomposition, hazardous products may be produced: carbon monoxide, Carbon dioxide. Exposure to combustion or decomposition products may be a hazard to health. Carbon monoxide is very toxic by inhalation. Carbon dioxide, in sufficient concentrations, may behave as a suffocating gas.
- 5.3 ADVICE FOR FIREFIGHTERS:
Special protective equipment:
Depending on magnitude of fire, heat-proof protective clothing may be required, appropriate independent breathing apparatus, gloves, protective glasses or face masks and boots. If the fire-proof protective equipment is not available or is not being used, combat fire from a sheltered position or from a safe distance. The standard EN469 provides a basic level of protection for chemical incidents.
Other recommendations:
Cool with water the tanks, cisterns or containers close to sources of heat or fire. Bear in mind the direction of the wind. Do not allow fire-fighting residue to enter drains, sewers or water courses.

SECTION 6: ACCIDENTAL RELEASE MEASURES

- 6.1 PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES:
Eliminate possible sources of ignition and when appropriate, ventilate the area. Do not smoke. Avoid direct contact with this product. Avoid breathing vapours. Keep people without protection in opposition to the wind direction.
- 6.2 ENVIRONMENTAL PRECAUTIONS:
Avoid contamination of drains, surface or subterranean water and soil. In the case of large scale spills or when the product contaminates lakes, rivers or sewages, inform the appropriate authorities in accordance with local regulations.
- 6.3 METHODS AND MATERIAL FOR CONTAINMENT AND CLEANING UP:
Contain and mop up spills with non-combustible absorbent materials (earth, sand, vermiculite, diatomaceous earth, etc.). Do not absorb in sawdust or other combustible absorbent materials. Keep the remains in a closed container.
- 6.4 REFERENCE TO OTHER SECTIONS:
For contact information in case of emergency, see section 1.
For information on safe handling, see section 7.
For exposure controls and personal protection measures, see section 8.
For waste disposal, follow the recommendations in section 13.

SECTION 7: HANDLING AND STORAGE

- 7.1 PRECAUTIONS FOR SAFE HANDLING:
Comply with the existing legislation on health and safety at work.
- General recommendations:
Avoid any type of leakage or escape. Keep the container tightly closed.
- Recommendations for the prevention of fire and explosion risks:
Vapours are heavier than air, may spread along floors to a considerable distance, can form explosive mixtures with air and are able to reach distant ignition sources and flame up or explode. Due to its flammability, this material should only be used in areas from which all naked lights and other sources of ignition have been excluded and away from other heat or electrical sources. Switch mobile phones off and do not smoke. No tools with a potential for sparks should be used.
Flashpoint -19 °C (Pensky-Martens) CLP 2.6.4.3.
Autoignition temperature: 321 °C
Lower/upper flammability or explosive limits: 1,5 - 11,9 % Volume 25°C
Ventilation requirement: 185 m³/l Air/Preparation
- Recommendations for the prevention of toxicological risks:
Do not eat, drink or smoke while handling. After handling, wash hands with soap and water. For exposure controls and personal protection measures, see section 8.
- Recommendations for the prevention of environmental contamination:
It is not considered a danger to the environment. In the case of accidental spillage, follow the instructions indicated in section 6.
- 7.2 CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES:
Forbid the entry to unauthorized persons. This product should be stored isolated from heat and electrical sources. Do not smoke in storage area. Avoid direct contact with sunlight. Avoid extreme humidity conditions. Keep container in a well-ventilated place. Avoid storage on wooden floors. In order to avoid leakages, the containers, after use, should be closed carefully and placed in a vertical position. Keep container tightly closed. For more information, see section 10.
- Class of store:
According to current legislation.
- Maximum storage period:
6 Months.
- Temperature interval:
min:5 °C, max:30 °C (recommended).
- Incompatible materials:
Keep away from oxidizing agents, alkalis, amines.
- Type of packaging:
According to current legislation.
- Limit quantity (Seveso III): Directive 2012/18/EU:



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- Named dangerous substances/mixtures:None
- Hazard categories and lower-/upperthreshold quantities in tonnes (t):
- Physical hazards:Highly flammable liquid and vapour. (P5c) (5000t/50000t).
- Health hazards:Not applicable
- Environmental hazards:Not applicable
- Other hazards:Not applicable
- Threshold quantity for the application of lower-tier requirements:5000 tons
- Threshold quantity for the application of upper-tier requirements:50000 tons

- Remarks:

The qualifying quantities set out above relate to each establishment. The quantities to be considered for the application of the relevant Articles are the maximum quantities which are present or are likely to be present at any one time. Dangerous substances present at an establishment only in quantities equal to or less than 2 % of the relevant qualifying quantity shall be ignored for the purposes of calculating the total quantity present, if their location within an establishment is such that it cannot act as an initiator of a major accident elsewhere at that establishment. For more details, see note 4 of Annex I of the Seveso Directive.

7.3 SPECIFIC END USE(S):

For the use of this product particular recommendations apart from that already indicated are not available.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION8.1 CONTROL PARAMETERS:

If a product contains ingredients with exposure limits, may be necessary a personnel monitoring, work place or biological, to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to EN689, EN14042 and EN482 standard concerning methods for assessing the exposure by inhalation to chemical agents, and exposure to chemical and biological agents. Reference should be also made to national guidance documents for methods for the determination of dangerous substances.

- OCCUPATIONAL EXPOSURE LIMIT VALUES (WEL)

EH40/2005 WELs (United Kingdom) 2018	Year	WEL-TWA		WEL-STEL		Remarks
		ppm	mg/m3	ppm	mg/m3	
Tetrahydrofuran	2006	50	147	100	295	BMGV, Sk, A3

WEL - Workplace Exposure Limit, TWA - Time Weighted Average (8 hours), STEL - Short Term Exposure Limit (15 min).

BMGV - Biological monitoring guidance value. BMGVs are non-statutory and any biological monitoring undertaken in association with a guidance value needs to be conducted on a voluntary basis (ie with the fully informed consent of all concerned).

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.

A3 - Carcinogenic in animals.

- Dermal (Sk):

Means that, in exposures to this substance, the contribution by the cutaneous route, including the mucous membranes and eyes, may result significant for the overall body content if no measures are taken to prevent absorption. There are some chemicals for which dermal absorption, both in liquid and vapour phases, can be very high, and this route of entry may be of equal or greater importance even than the inhalation pathway. In these situations, the use of a biological control is essential in order to quantify the overall amount of contaminant absorbed.

- BIOLOGICAL LIMIT VALUES:

Biological monitoring can be a very useful complementary technique to air monitoring when air sampling techniques alone may not give a reliable indication of exposure. Biological monitoring is the measurement and assessment of hazardous substances or their metabolites in tissues, secretions, excreta or expired air, or any combination of these, in exposed workers. Measurements reflect absorption of a substance by all routes. Biological monitoring may be particularly useful in circumstances where there is likely to be significant skin absorption and/or gastrointestinal tract uptake following ingestion, where control of exposure depends on respiratory protective equipment, where there is a reasonably well-defined relationship between biological monitoring and effect, or where it gives information on accumulated dose and target organ body burden which is related to toxicity.

Substances that have established a biological limit value:

-

- DERIVED NO-EFFECT LEVEL (DNEL):

Derived no-effect level (DNEL) is a level of exposure that is considered safe, derived from toxicity data according to specific guidances included in REACH. DNEL values may differ from an occupational exposure limit (OEL) for the same chemical. OEL values may come recommended by a particular company, a government regulatory agency or an organization of experts. Although considered protective of health, the OEL values are derived by a process different of REACH.

- DERIVED NO-EFFECT LEVEL, WORKERS:- Systemic effects, acute and chronic:	DNEL Inhalation mg/m3		DNEL Cutaneous mg/kg bw/d		DNEL Oral mg/kg bw/d	
Tetrahydrofuran	300 (a)	150 (c)	- (a)	25 (c)	- (a)	- (c)
- DERIVED NO-EFFECT LEVEL, WORKERS:- Local effects, acute and chronic:	DNEL Inhalation mg/m3		DNEL Cutaneous mg/cm2		DNEL Eyes mg/cm2	
Tetrahydrofuran	300 (a)	150 (c)	- (a)	- (c)	- (a)	- (c)
- DERIVED NO-EFFECT LEVEL, GENERAL POPULATION:- Systemic effects, acute and chronic:	DNEL Inhalation mg/m3		DNEL Cutaneous mg/kg bw/d		DNEL Eyes mg/kg bw/d	
Tetrahydrofuran	150 (a)	62 (c)	- (a)	15 (c)	- (a)	15 (c)
- LOCAL EFFECTS, ACUTE AND CHRONIC:- Local effects, acute and chronic:	DNEL Inhalation mg/m3		DNEL Cutaneous mg/cm2		DNEL Eyes mg/cm2	
Tetrahydrofuran	150 (a)	75 (c)	- (a)	- (c)	- (a)	- (c)



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(a) - Acute, short-term exposure, (c) - Chronic, long-term or repeated exposure.
 (-) - DNEL not available (without data of registration REACH).

- PREDICTED NO-EFFECT CONCENTRATION (PNEC):

<u>- PREDICTED NO-EFFECT CONCENTRATION, AQUATIC ORGANISMS:- Fresh water, marine water and intermittent release:</u> Tetrahydrofuran	<u>PNEC Fresh water</u> mg/l 4.32	<u>PNEC Marine</u> mg/l 0.432	<u>PNEC Intermittent</u> mg/l 21.6
<u>- WASTEWATER TREATMENT PLANTS (STP) AND SEDIMENTS IN FRESH- AND MARINE WATER:</u> Tetrahydrofuran	<u>PNEC STP</u> mg/l 4.6	<u>PNEC Sediments</u> mg/kg dw/d 23.3	<u>PNEC Sediments</u> mg/kg dw/d 2.33
<u>- PREDICTED NO-EFFECT CONCENTRATION, TERRESTRIAL ORGANISMS:- Air, soil and effects for predators and humans:</u> Tetrahydrofuran	<u>PNEC Air</u> mg/m3 -	<u>PNEC Soil</u> mg/kg dw/d 2.13	<u>PNEC Oral</u> mg/kg dw/d 67

(-) - PNEC not available (without data of registration REACH).

8.2

EXPOSURE CONTROLS:ENGINEERING MEASURES:

Provide adequate ventilation. Where reasonably practicable, this should be achieved by the use of local exhaust ventilation and good general extraction. If these measures are not sufficient to maintain concentrations of vapours below the Occupational Exposure Limits, suitable respiratory protection must be worn.

- Protection of respiratory system:

Avoid the inhalation of solvents.

- Protection of eyes and face:

It is recommended to install water taps, sources or eyewash bottles with clean water close to the working area.

- Protection of hands and skin:

It is recommended to install water taps or sources with clean water close to the working area. Barrier creams may help to protect the exposed areas of the skin. Barrier creams should not be applied once exposure has occurred.

OCCUPATIONAL EXPOSURE CONTROLS: REGULATION (EU) NO. 2016/425:

As a general measure on prevention and safety in the work place, we recommend the use of a basic personal protection equipment (PPE), with the corresponding marking. For more information on personal protective equipment (storage, use, cleaning, maintenance, type and characteristics of the PPE, protection class, marking, category, CEN norm, etc.), you should consult the informative brochures provided by the manufacturers of PPE.

Mask: 	✓ A-type filter mask (brown) for gases and vapours of organic compounds with a boiling point higher than 65°C (EN14387). Class 1: low capacity up to 1000 ppm, Class 2: medium capacity up to 5000 ppm, Class 3: high capacity up to 10000 ppm. In order to obtain a suitable protection level, the filter class must be selected depending on the type and concentration of the contaminating agents present, in accordance with the specifications supplied by the filter producers. The gas and vapour filters should be changed when you detect the taste or smell of the contaminant. The respiratory equipment with filters does not work satisfactorily when the air contains high concentrations of vapour or oxygen content less than 18% in volume. In presence of high concentrations of vapour, use independent breathing apparatus.
Safety goggles: 	✓ Safety goggles designed to protect against liquid splashes, with suitable lateral protection (EN166). Clean daily and disinfect at regular intervals in accordance with the instructions of the manufacturer.
Face shield:	No.
Gloves: 	✓ Nitrile rubber gloves, thick >0.5 mm (EN374). Butyl rubber gloves, thick >0.7 mm (EN374). Recommended minimal level 5, breakthrough time >240 min (protection for permanent contact). When short contact with the product is expected, use gloves with a protection level 3 or higher should be used, with a breakthrough time >60 min. There are several factors (for example, temperature), they do in practice the period of use of a protective gloves resistant against chemicals is clearly lower than the established standard EN374. Due to the wide variety of circumstances and possibilities, the instructions/specifications provided by the glove supplier should be taken into account. The gloves should be immediately replaced when any sign of degradation is noted.
Boots:	No.
Apron: 	✓ Advisable.
Clothing:	Advisable.

- Thermal hazards:

Not applicable (the product is handled at room temperature).

ENVIRONMENTAL EXPOSURE CONTROLS:

Avoid any spillage in the environment. Avoid any release into the atmosphere.



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- Spills on the soil:

Prevent contamination of soil.

- Spills in water:

Do not allow to escape into drains, sewers or water courses.

-Water Management Act:

This product does not contain any substance included in the list of priority substances in the field of water policy under Directive 2000/60/EC~2013/39/EU.

- Emissions to the atmosphere:

Because of volatility, emissions to the atmosphere while handling and use may result, in special when it is used as a solvent. Avoid any solvent release into the atmosphere.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES:Appearance

Physical state:	Liquid
Colour:	Colourless
Odour:	Characteristic
Odour threshold:	2,00 ppm

Change of state

Melting point:	-108,50 °C
Initial boiling point:	66 °C at 760 mmHg

- Flammability:

Flashpoint	-19 °C (Pensky-Martens)	CLP 2.6.4.3.
Lower/upper flammability or explosive limits:	1,49 - 11,87	
Autoignition temperature:	321 °C	

Stability

Decomposition temperature: Not available (lack of data).

pH-value

pH: Not applicable (neutral organic substance).

- Viscosity:

Dynamic viscosity:	0,55 cps at 20°C
Kinematic viscosity:	0,19 mm ² /s at 40°C

- Solubility(ies):

Solubility in water	Miscible
Liposolubility:	Not applicable (inorganic substance).
Partition coefficient: n-octanol/water:	0,46 (as log Pow)

- Volatility:

Vapour pressure:	143 mmHg at 20°C	
Vapour pressure:	59,4214 kPa at 50°C	
Evaporation rate:	474,13 nBuAc=100 25°C	Relative

Density

Relative density:	0,887 at 20/4°C	Relative water
Relative vapour density:	2,49 at 20°C 1 atm.	Relative air

Particle characteristics

Particle size: Not applicable.

- Explosive properties:

In the molecule there is no chemical groups associated with explosive properties.

- Oxidizing properties:

Not classified as oxidizing product.

9.2 OTHER INFORMATION:Information regarding physical hazard classes

Flammable liquids: Combustibility: Combustible.

Other security features:

Molecular weight (numeric):	72,11 g/mol
Surface tension:	28,4 din/cm at 20°C
Heat of combustion:	8804 Kcal/kg
VOC (supply):	100,0 % Weight
VOC (supply):	887,0 g/l

The values indicated do not always coincide with product specifications. The data for the product specifications can be found in the corresponding technical data sheet. For additional information concerning physical and chemical properties related to safety and environment, see sections 7 and 12.



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SECTION 10: STABILITY AND REACTIVITY

10.1	REACTIVITY: <u>- Corrosivity to metals:</u> It is not corrosive to metals. <u>- Pyrophorical properties:</u> It is not pyrophoric.
10.2	CHEMICAL STABILITY: Stable under recommended storage and handling conditions. Should overheating an exothermic polymerisation reaction may occur. It usually contains 2,6-di-tert-butyl-4-methylphenol (BHT) as stabilizers. Normaly contains 2-tert-butyl-4-methylphenol as stabiliser. It can easily form explosive peroxides if it is destabilized. Before distillation check the presence of peroxides; if so, remove them.
10.3	POSSIBILITY OF HAZARDOUS REACTIONS: Possible dangerous reaction with oxidizing agents, alkalis, amines. May form explosive peroxides.
10.4	CONDITIONS TO AVOID: <u>- Heat:</u> Keep away from heat. Should soft heating occur, decomposes producing explosive peroxides. Before distillation check the presence of peroxides; if so, remove them. <u>- Light:</u> Avoid direct contact with sunlight. <u>- Air:</u> Exposure to air favours the formation of peroxides. <u>- Humidity:</u> Avoid humidity. <u>- Pressure:</u> Not relevant. <u>- Shock:</u> The product is not sensitive to shocks, but as a recommendation of a general nature should be avoided bumps and rough handling to avoid dents and breakage of packaging, especially when the product is handled in large quantities, and during loading and download operations.
10.5	INCOMPATIBLE MATERIALS: Keep away from oxidizing agents, alkalis, amines.
10.6	HAZARDOUS DECOMPOSITION PRODUCTS: As consequence of thermal decomposition, hazardous products may be produced: carbon monoxide. No product of decomposition is dangerous if stored and handled properly.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1	INFORMATION ON HAZARD CLASSES AS DEFINED IN REGULATION (EC) NO 1272/2008 : ACUTE TOXICITY:			
	Dose and lethal concentrations for individual ingredients:	DL50 (OECD401) mg/kg bw Oral	DL50 (OECD402) mg/kg bw Cutaneous	CL50 (OECD403) mg/m ³ ·4h Inhalation
	Tetrahydrofuran	1650 Rat	2620 Rat	> 53900 Rat
	Estimates of acute toxicity (ATE) for individual ingredients:	ATE mg/kg bw Oral	ATE mg/kg bw Cutaneous	ATE mg/m ³ ·4h Inhalation
	Tetrahydrofuran	1650	-	53900 Vapours
	(*) - Point estimates of acute toxicity corresponding to the classification category (see GHS/CLP Table 3.1.2). These values are designed to be used in the calculation of the ATE for classification of a mixture based on its components and do not represent test results. (-) - The components that are assumed to have no acute toxicity at the upper threshold of category 4 for the corresponding exposure route are ignored.			
	<u>- No observed adverse effect level</u> Not available			
	<u>- Lowest observed adverse effect level</u> Not available			
	INFORMATION ON LIKELY ROUTES OF EXPOSURE: ACUTE TOXICITY:			
	Routes of exposure	Acute toxicity	Cat.	Main effects, acute and/or delayed
	Inhalation: Not classified	ATE > 5000 mg/m ³	Not available.	Not classified as a product with acute toxicity if inhaled (based on available data, the classification criteria are not met).
	Skin: Not classified	ATE > 2000 mg/kg bw	Not available.	Not classified as a product with acute toxicity in contact with skin (based on available data, the classification criteria are not met).
	Eyes: Not classified	Not available.	-	Not classified as a product with acute toxicity by eye contact (lack of data).



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Ingestion:		ATE : 1.650 mg/kg bw	Cat.4	HARMFUL: Harmful if swallowed.	GHS/CLP 3.1.2. OECD 401
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GHS/CLP 3.1.3.6: Classification of mixtures based on ingredients of the mixture (additivity formula).

CORROSION / IRRITATION / SENSITISATION :

Danger class	Target organs	Cat.	Main effects, acute and/or delayed	Criteria
- Respiratory corrosion/irritation: 	Respiratory tract 	Cat.3	IRRITANT: May cause respiratory irritation.	GHS/CLP 1.2.6. 3.8.2.2.1.
- Skin corrosion/irritation: Not classified	-	-	Not classified as a product corrosive or irritant in contact with skin (based on available data, the classification criteria are not met).	GHS/CLP 3.2.2. OECD 404
- Serious eye damage/irritation: 	Eyes 	Cat.2	IRRITANT: Causes serious eye irritation.	GHS/CLP 3.3.2. OECD 405
- Respiratory sensitisation: Not classified	-	-	Not classified as a product sensitising by inhalation (based on available data, the classification criteria are not met).	GHS/CLP 3.4.2.1.
- Skin sensitisation: Not classified	-	-	Not classified as a product sensitising by skin contact (based on available data, the classification criteria are not met).	GHS/CLP 3.4.2.2. OECD 406

GHS/CLP 3.2.3.3: Classification of the mixture when data are available for all components or only for some components.

GHS/CLP 3.3.3.3: Classification of the mixture when data are available for all components or only for some components.

GHS/CLP 3.4.3.3: Classification of the mixture when data are available for all components or only for some components.

GHS/CLP 3.8.3.4: Classification of the mixture when data are available for all components or only for some components.

- ASPIRATION HAZARD:

Danger class	Target organs	Cat.	Main effects, acute and/or delayed	Criteria
- Aspiration hazard: Not classified	-	-	Not classified as a product hazardous by aspiration (based on available data, the classification criteria are not met).	GHS/CLP 3.10.2.

GHS/CLP 3.10.3.3: Classification of the mixture when data are available for all components or only for some components.

SPECIFIC TARGET ORGANS TOXICITY (STOT): Single exposure (SE) and/or Repeated exposure (RE):

Effects	SE/RE	Target organs	Cat.	Main effects, acute and/or delayed	Criteria
- Respiratory effects:	SE 	Respiratory tract 	Cat.3	IRRITANT: May cause respiratory irritation.	GHS/CLP 3.8.3.4

GHS/CLP 3.8.3.4: Classification of the mixture when data are available for all components or only for some components.

CMR EFFECTS:- Carcinogenic effects:

Ingredients which can cause cancer: Tetrahydrofuran (Cat.2)

- Genotoxicity:

It is not considered as a mutagenic product.

- Toxicity for reproduction:

Does not harm fertility. Does not harm the unborn child.

- Effects via lactation:

Not classified as a hazardous product for children breast-fed.

DELAYED AND IMMEDIATE EFFECTS AS WELL AS CHRONIC EFFECTS FROM SHORT AND LONG-TERM EXPOSURE:Routes of exposure

May be absorbed by inhalation of vapour, through the skin and by ingestion.

- Short-term exposure:

Exposure to solvent vapour concentrations in excess of the stated occupational exposure limit, may result in adverse health effects, such as mucous membrane and respiratory system irritation and adverse effects on kidneys, liver and central nervous system. Liquid splashes in the eyes may cause irritation and reversible damage. If swallowed, may cause irritation of the throat; other effects may be the same as described in the exposure to vapours. Causes skin irritation. May cause respiratory irritation. May cause drowsiness or dizziness.



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- Long-term or repeated exposure:

Repeated or prolonged contact may cause removal of natural fat from the skin, resulting in non-allergic contact dermatitis and absorption through the skin.

INTERACTIVE EFFECTS:

Not available.

INFORMATION ABOUT TOXICOCINETICS, METABOLISM AND DISTRIBUTION:- Dermal absorption:

Substances for which dermal absorption can be very high: Tetrahydrofuran.

- Basic toxicokinetics:

Not available.

ADDITIONAL INFORMATION:

Not available.

11.2 INFORMATION ON OTHER HAZARDS:Endocrine disrupting properties:

This product does not contain substances with endocrine disrupting properties identified or under evaluation.

Other information:

No additional information available.

SECTION 12: ECOLOGICAL INFORMATION

12.1 TOXICITY:

- Acute toxicity in aquatic environment for individual ingredients	CL50 (OECD 203) mg/l·96hours	CE50 (OECD 202) mg/l·48hours	CE50 (OECD 201) mg/l·72hours
Tetrahydrofuran	2160 - Fishes	5930 - Daphniae	

- No observed effect concentration

Not available

- Lowest observed effect concentration

Not available

ASSESSMENT OF AQUATIC TOXICITY:

Aquatic toxicity	Cat.	Main hazards to the aquatic environment	Criteria
- Acute aquatic toxicity: Not classified	-	Not classified as a hazardous product with acute toxicity to aquatic life (based on available data, the classification criteria are not met).	GHS/CLP 4.1.2.
- Chronic aquatic toxicity:	-	Not classified as a dangerous product with chronic toxicity to aquatic life with long lasting effects (based on available data, the classification criteria are not met).	GHS/CLP 4.1.2.

CLP 4.1.3.5.5.3: Classification of a mixture for acute hazards, based on summation of classified components.

CLP 4.1.3.5.5.4: Classification of a mixture for chronic (long term) hazards, based on summation of classified components.

12.2 PERSISTENCE AND DEGRADABILITY:- Biodegradability:

Not readily biodegradable.

Aerobic biodegradation for individual ingredients	COD mgO2/g	%DBO/DQO 5 days 14 days 28 days	Biodegradabilidad
Tetrahydrofuran	1855	- - 39	Not easy

Note: Biodegradability data correspond to an average of data from various bibliographic sources.

- Hydrolysis:

Not available.

- Photodegradability:

Degradation in the atmospheric environment is expected within a few days.

12.3 BIOACCUMULATIVE POTENTIAL:

It is unlikely to bioaccumulate.

Bioaccumulation for individual ingredients	logPow	BCF L/kg	Potential
Tetrahydrofuran	0.46	3.2 (calculated)	Unlikely, low

12.4 MOBILITY IN SOIL:

Because of its volatility, is found predominantly in the air. It is not expected to fragment into sediments and solid wastes. It is not foreseeable the absorption in the solid phase of the terrain.

Mobility for individual ingredients	log Pod	Constant of Henry Pa·m3/mol 20°C	Potential
Tetrahydrofuran	1,09		Unlikely, low

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12.5	RESULTS OF PBT AND VPVB ASSESMENT:(Annex XIII of Regulation (EC) no. 1907/2006:) Do not fulfil the PBT/vPvB criteria : Half-life in the marine environment < 60 days,Half-life in fresh-water or estuarine < 40 days,Half-life in marine sediments < 180 days,Half-life in sediments of fresh-water or estuarine < 120 days,Half-life in the soil < 120 days,Bioconcentration factor BCF < 2000,Long term 'No observed effect concentration' for fresh-water or marine organisms NOEC > 0.01 mg/l,It is NOT classified as CMR,It has NO endocrine disrupting potential.				
12.6	ENDOCRINE DISRUPTING PROPERTIES: This product does not contain substances with endocrine disrupting properties identified or under evaluation.				
12.7	OTHER ADVERSE EFFECTS: <u>- Ozone depletion potential:</u> Not dangerous for the ozone layer. Substance not listed in Annex I to Regulation (EC) 2037/2000~1005/2009 on substances that deplete the ozone layer. <u>- Photochemical ozone creation potential:</u> It contributes relatively little to the formation of ozone in the troposphere. <u>- Earth global warming potential:</u> In case of fire or incineration liberates CO2.				
SECTION 13: DISPOSAL CONSIDERATIONS					
13.1	WASTE TREATMENT METHODS:Directive 2008/98/EC~Regulation (EU) no. 1357/2014: Take all necessary measures to prevent the production of waste whenever possible. Analyse possible methods for revaluation or recycling. Do not discharge into drains or the environment, dispose at an authorised waste collection point. Waste should be handled and disposed in accordance with current local and national regulations. For exposure controls and personal protection measures, see section 8. <u>Disposal of empty containers:Directive 94/62/EC~2015/720/EU. Decision 2000/532/EC~2014/955/EU:</u> Emptied containers and packaging should be disposed in accordance with currently local and national regulations.The classification of packaging as hazardous waste will depend on the degree of emptying of the same, being the holder of the residue responsible for their classification, in accordance with Chapter 15 01 of Decision 2000/532/EC, and forwarding to the appropriate final destination.With contaminated containers and packaging, adopt the same measures as for the product in itself. <u>Procedures for neutralising or destroying the product:</u> Controlled incineration in special facilities for chemical waste, in accordance with local regulations.				
SECTION 14: TRANSPORT INFORMATION					
14.1	UN NUMBER OR ID NUMBER: 2056				
14.2	UN PROPER SHIPPING NAME: TETRAHYDROFURAN				
14.3	TRANSPORT HAZARD CLASS(ES): <u>Transport by road (ADR 2021) and</u> <u>Transport by rail (RID 2021):</u> - Class: 3 - Packing group: II - Classification code: F1 - Tunnel restriction code: (D/E) - Transport category: 2, max. ADR 1.1.3.6. 333 L - Limited quantities: 1 L (see total exemptions ADR 3.4) - Transport document: Consignment paper. - Instructions in writing: ADR 5.4.3.4  <u>Transport by sea (IMDG 39-18):</u> - Class: 3 - Packing group: II - Emergency Sheet (EmS): F-E,S-D - First Aid Guide (MFAG): 330 - Marine pollutant: No. - Transport document: Shipping Bill of lading.  <u>Transport by air (ICAO/IATA 2021):</u> - Class: 3 - Packing group: II - Transport document: Air Bill of lading.  <u>Transport by inland waterways (ADN):</u> Not available				
14.4	PACKING GROUP: See section 14.3				
14.5	ENVIRONMENTAL HAZARDS: Not applicable (not classified as hazardous for the environment).				
14.6	SPECIAL PRECAUTIONS FOR USER: Ensure that persons transporting the product know what to do in case of accident or spill. Always transport in closed containers that are upright and secure. Ensure adequate ventilation. Keep separated from foodstuffs.				
14.7	MARITIME TRANSPORT IN BULK ACCORDING TO IMO INSTRUMENTS: Not available.				



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SECTION 15: REGULATORY INFORMATION

15.1 SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS/LEGISLATION SPECIFIC FOR THE SUBSTANCE OR MIXTURE:

The regulations applicable to this product generally are listed throughout this Safety Data Sheet.

Restrictions on manufacture, placing on market and use:

See section 1.2

Tactile warning of danger:

If the product is intended for the public in general, a tactile danger sign is mandatory. The technical specifications for tactile warning devices shall conform with EN ISO standard 11683 relating to 'Packaging - Tactile warnings of danger - Requirements.'

Child safety protection:

Not applicable (the classification criteria are not met).

OTHER REGULATIONS:

Control of the risks inherent in major accidents (Seveso III):

See section 7.2

Other local legislations:

The receiver should verify the possible existence of local regulations applicable to the chemical.

15.2 CHEMICAL SAFETY ASSESSMENT:

A chemical safety assessment has been carried out for this product.

SECTION 16 : OTHER INFORMATION

16.1 TEXT OF THE PHRASES AND NOTES REFERENCED IN SECTIONS 2 AND/OR 3:

Hazard statements according the Regulation (EU) No. 1272/2008~2021/849 (CLP), Annex III:

H225 Highly flammable liquid and vapour. H302 Harmful if swallowed. H319 Causes serious eye irritation. H335 May cause respiratory irritation. EUH019 May form explosive peroxides. H351 Suspected of causing cancer.

ADVISES ON ANY TRAINING APPROPRIATE FOR WORKERS:

It is recommended for all staff that will handle this product to carry out a basic training in occupational risk and prevention, in order to provide understanding and interpretation of Safety Data Sheets and labelling of products as well.

MAIN LITERATURE REFERENCES AND SOURCES FOR DATA:

- European Chemicals Agency: ECHA, <http://echa.europa.eu/>
- Access to European Union Law, <http://eur-lex.europa.eu/>
- Industrial Solvents Handbook, Ibert Mellan (Noyes Data Co., 1970).
- Threshold Limit Values, (AGCIH, 2021).
- European agreement on the international carriage of dangerous goods by road, (ADR 2021).
- International Maritime Dangerous Goods Code IMDG including Amendment 39-18 (IMO, 2018).

ABBREVIATIONS AND ACRONYMS:

List of abbreviations and acronyms that can be used (but not necessarily used) in this Safety Data Sheet:

- REACH: Regulation concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals.
- GHS: Globally Harmonized System of Classification and Labelling of Chemicals of the United Nations.
- CLP: European regulation on Classification, Labelling and Packaging of substances and chemical mixtures.
- EINECS: European Inventory of Existing Commercial Chemical Substances.
- ELINCS: European List of Notified Chemical Substances.
- CAS: Chemical Abstracts Service (Division of the American Chemical Society).
- UVCB: Substances of Unknown or Variable composition, complex reaction products or biological materials.
- SVHC: Substances of Very High Concern.
- PBT: Persistent, bioaccumulable and toxic substances.
- vPvB: Very persistent and very bioaccumulable substances.
- VOC: Volatile Organic Compounds.
- DNEL: Derived No-Effect Level (REACH).
- PNEL: Predicted No-Effect Concentration (REACH).
- LC50: Lethal concentration, 50 percent.
- LD50: Lethal dose, 50 percent.
- UN: United Nations Organisation.
- ADR: European agreement concerning the international carriage of dangerous goods by road.
- RID: Regulations concerning the international transport of dangerous goods by rail.
- IMDG: International Maritime code for Dangerous Goods.
- IATA: International Air Transport Association.
- ICAO: International Civil Aviation Organization.

SAFETY DATA SHEET REGULATIONS:

Safety Data Sheet in accordance with Article 31 of Regulation (EC) No. 1907/2006 (REACH) and Annex of Regulation (EU) No. 2020/878.

HISTORIC: REVISION:

Version: 1 28/03/2023

Version: 2 29/03/2023

Changes since previous Safety Data Sheet:

Legislative, contextual, numerical, methodological and normative changes since the previous version of the present Safety Data Sheet are identified by #.

The information of this Safety Data Sheet, is based on the present state of knowledge and on current UE and national laws, as the users' working conditions are beyond our knowledge and control. The product is not to be used for other purposes than those specified, without first obtaining written handling instruction. It is always the responsibility of the user to take all necessary steps in order to fulfil the demand laid down in the local rules and legislation. The information in this Safety Data Sheet is meant as a description of the safety requirements of the product and it is not to be considered as a guarantee of the product's properties.