



LEMON CALIFORNIA OIL

Safety Data Sheet

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878
Issue date: 6/18/2018 Revision date: 4/17/2024 Supersedes version of: 10/25/2023 Version: 2.7

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

1.1. Product identifier

Product form : Mixture
Product name : LEMON CALIFORNIA OIL
CAS-No. : N/A
Product code : 50-6160-01
Product group : Trade product

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

1.2.1. Relevant identified uses

No additional information available

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

The Lebermuth Company
4004 Technology Drive
46628 South Bend, IN
United States
T 574-259-7000, F 574-258-7450
info@lebermuth.com, www.lebermuth.com

1.4. Emergency telephone number

Emergency number : CHEMTREC - USA: 800-424-9300 International: +1 703-527-3887 / 1-800-424-9300
CCN 13010

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Flammable liquids, Category 3	H226
Skin corrosion/irritation, Category 2	H315
Skin sensitisation, Category 1	H317
Reproductive toxicity, Category 2	H361
Aspiration hazard, Category 1	H304
Hazardous to the aquatic environment – Acute Hazard, Category 1	H400
Hazardous to the aquatic environment – Chronic Hazard, Category 1	H410

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

Adverse physicochemical, human health and environmental effects

Toxic to aquatic life with long lasting effects. Flammable liquid and vapour. Suspected of damaging fertility or the unborn child. Causes skin irritation. May cause an allergic skin reaction. May be fatal if swallowed and enters airways. Very toxic to aquatic life with long lasting effects.

2.2. Label elements

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

Hazard pictograms (CLP) :



Signal word (CLP) :

: Danger

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Contains	: citral; Neryl Acetate; D-limonene; beta-myrcene; alpha-pinene; beta-pinene; terpinolene; gamma-terpinene; alpha-terpinene; beta-bisabolene; beta-caryophyllene; geranyl acetate
Hazard statements (CLP)	: H226 - Flammable liquid and vapour. H304 - May be fatal if swallowed and enters airways. H315 - Causes skin irritation. H317 - May cause an allergic skin reaction. H361 - Suspected of damaging fertility or the unborn child. H410 - Very toxic to aquatic life with long lasting effects.
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/vapours/spray. P264 - Wash hands, forearms and face thoroughly after handling. P272 - Contaminated work clothing should not be allowed out of the workplace. P273 - Avoid release to the environment. P280 - Wear protective gloves/protective clothing/eye protection/face protection/hearing protection. P301+P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor. P302+P352 - IF ON SKIN: Wash with plenty of water. P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water . P308+P313 - IF exposed or concerned: Get medical advice/attention. P321 - Specific treatment (see supplemental first aid instruction on this label). P331 - Do NOT induce vomiting. P332+P313 - If skin irritation occurs: Get medical advice/attention. P333+P313 - If skin irritation or rash occurs: Get medical advice/attention. P362+P364 - Take off contaminated clothing and wash it before reuse. P370+P378 - In case of fire: Use media other than water to extinguish. P391 - Collect spillage. 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.

2.3. Other hazards

Contains no PBT and/or vPvB substances $\geq 0.1\%$ assessed in accordance with REACH Annex XIII

Component	
Substance(s) not meeting the PBT criteria of REACH regulation, in accordance with Annex XIII	D-LIMONENE (5989-27-5), PINENE (80-56-8), BETA-PINENE (127-91-3), P-CYMENE (99-87-6)
Substance(s) not meeting the vPvB criteria of REACH regulation, in accordance with Annex XIII	D-LIMONENE (5989-27-5), PINENE (80-56-8), BETA-PINENE (127-91-3), P-CYMENE (99-87-6)

The mixture does not contain substance(s) included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or substance(s) are 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 at a concentration equal to or greater than 0,1 %

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

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3.2. Mixtures

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
D-LIMONENE substance with national workplace exposure limit(s) (DE, ES)	CAS-No.: 5989-27-5 EC-No.: 227-813-5 EC Index-No.: 601-096-00-2	50 – 75	Flam. Liq. 3, H226 Skin Irrit. 2, H315 Skin Sens. 1B, H317 Asp. Tox. 1, H304 Aquatic Acute 1, H400 Aquatic Chronic 1, H410
BETA-PINENE substance with national workplace exposure limit(s) (BE, ES)	CAS-No.: 127-91-3 EC-No.: 204-872-5	10 – 25	Flam. Liq. 3, H226 Skin Irrit. 2, H315 Skin Sens. 1B, H317 Asp. Tox. 1, H304 Aquatic Acute 1, H400 Aquatic Chronic 1, H410
GAMMA-TERPINENE	CAS-No.: 99-85-4 EC-No.: 202-794-6	5 – 10	Flam. Liq. 3, H226 Repr. 2, H361 Asp. Tox. 1, H304 Aquatic Chronic 2, H411
CITRAL substance with national workplace exposure limit(s) (BE, ES)	CAS-No.: 5392-40-5 EC-No.: 226-394-6 EC Index-No.: 605-019-00-3	1 – 5	Skin Irrit. 2, H315 Eye Irrit. 2, H319 Skin Sens. 1, H317
PINENE substance with national workplace exposure limit(s) (BE, ES)	CAS-No.: 80-56-8 EC-No.: 201-291-9	1 – 5	Flam. Liq. 3, H226 Acute Tox. 4 (Oral), H302 Skin Irrit. 2, H315 Skin Sens. 1B, H317 Asp. Tox. 1, H304 Aquatic Acute 1, H400 Aquatic Chronic 1, H410
BETA-MYRCENE	CAS-No.: 123-35-3 EC-No.: 204-622-5	1 – 5	Flam. Liq. 3, H226 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Asp. Tox. 1, H304 Aquatic Acute 1, H400 Aquatic Chronic 2, H411
P-CYMENE	CAS-No.: 99-87-6 EC-No.: 202-796-7 EC Index-No.: 601-094-00-1	0.1 – 1	Flam. Liq. 3, H226 Acute Tox. 3 (Inhalation), H331 Acute Tox. 3 (Inhalation:vapour), H331 Repr. 2, H361 Asp. Tox. 1, H304 Aquatic Chronic 2, H411
I-.BETA-BISABOLENE*	CAS-No.: 495-61-4 EC-No.: n.a.	0.1 – 1	Skin Irrit. 2, H315 Skin Sens. 1B, H317 Asp. Tox. 1, H304 Aquatic Chronic 2, H411 Acute Tox. 4 (Inhalation), H332
TERPINOLENE	CAS-No.: 586-62-9 EC-No.: 209-578-0	0.1 – 1	Skin Sens. 1B, H317 Asp. Tox. 1, H304 Aquatic Chronic 1, H410 Aquatic Acute 1, H400
NERYL ACETATE	CAS-No.: 141-12-8 EC-No.: 205-459-2	0.1 – 1	Skin Sens. 1B, H317

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Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
ALPHA-TERPINENE	CAS-No.: 99-86-5 EC-No.: 202-795-1	0.1 – 1	Flam. Liq. 3, H226 Acute Tox. 4 (Oral), H302 Skin Sens. 1, H317 Asp. Tox. 1, H304 Aquatic Chronic 2, H411
GERANYL ACETATE	CAS-No.: 105-87-3 EC-No.: 203-341-5	0.1 – 1	Skin Irrit. 2, H315 Skin Sens. 1B, H317 Aquatic Chronic 3, H412
BETA-CARYOPHYLLENE	CAS-No.: 87-44-5 EC-No.: 201-746-1	0.1 – 1	Skin Sens. 1B, H317 Asp. Tox. 1, H304

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

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general	: Call a physician immediately.
First-aid measures after inhalation	: Remove person to fresh air and keep comfortable for breathing.
First-aid measures after skin contact	: Rinse skin with water/shower. Take off immediately all contaminated clothing. If skin irritation or rash occurs: Get medical advice/attention.
First-aid measures after eye contact	: Rinse eyes with water as a precaution.
First-aid measures after ingestion	: Do not induce vomiting. Call a physician immediately.

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

Symptoms/effects after inhalation	: Although no appropriate human or animal health effects data are known to exist, this material is expected to be an inhalation hazard.
Symptoms/effects after skin contact	: Irritation. May cause an allergic skin reaction.
Symptoms/effects after eye contact	: None under normal conditions.
Symptoms/effects after ingestion	: Risk of lung oedema.

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

5.2. Special hazards arising from the substance or mixture

Fire hazard	: Flammable liquid and vapour.
Explosion hazard	: No direct explosion hazard.
Hazardous decomposition products in case of fire	: Toxic fumes may be released.

5.3. Advice for firefighters

Firefighting instructions	: Fight fire from safe distance and protected location. Do not enter fire area without proper protective equipment, including respiratory protection.
Protection during firefighting	: Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

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SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Stop leak if safe to do so. Notify authorities if product enters sewers or public waters.
Absorb spillage to prevent material damage.

6.1.1. For non-emergency personnel

Protective equipment : Wear recommended personal protective equipment.
Emergency procedures : Ventilate spillage area. No open flames, no sparks, and no smoking. Avoid contact with skin and eyes. Avoid breathing dust/fume/gas/mist/vapours/spray.

6.1.2. For emergency responders

Protective equipment : Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".
Emergency procedures : Evacuate unnecessary personnel. Stop leak if safe to do so.

6.2. Environmental precautions

Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Collect spillage. Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams. Stop leak without risks if possible.
Methods for cleaning up : Take up liquid spill into absorbent material. 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 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed : Not expected to present a significant hazard under anticipated conditions of normal use.
Precautions for safe handling : Ensure good ventilation of the work station. 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. Avoid contact with skin and eyes. Avoid breathing dust/fume/gas/mist/vapours/spray.
Hygiene measures : Wash contaminated clothing before reuse. Contaminated work clothing should not be allowed out of the workplace. 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 : Store in a well-ventilated place. Keep cool. Keep container tightly closed. Store locked up.
Packaging materials : Store always product in container of same material as original container.

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

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CITRAL (5392-40-5)	
Belgium - Occupational Exposure Limits	
Local name	Citral (vapeur et aérosol) # Citral (damp en aérosol)
OEL TWA	32 mg/m ³ 5 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.
Regulatory reference	Koninklijk besluit/Arrêté royal 16/11/2023
Spain - Occupational Exposure Limits	
Local name	Citral
VLA-ED (OEL TWA)	5 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), Sen (Sensibilizante), FIV (Fracción inhalable y vapor. La notación FIV señala a aquellos agentes químicos que se pueden presentar en el ambiente de trabajo, tanto en forma de materia particulada como vapor, por lo que las dos fases pueden coexistir, contribuyendo ambas a la exposición. Esta situación se puede dar, principalmente, en los siguientes casos: • Cuando el agente en cuestión tiene un valor "intermedio" de presión de vapor (en estos casos se tiene en cuenta la relación entre su concentración en el aire saturado de vapor y el valor del VLA-ED® y la nota se asigna, generalmente, cuando el cociente entre ambas cantidades se encuentra entre 0.1 y 10). • Por razón de la forma de uso del agente químico (por ejemplo, pulverización). • En los procesos que conlleven cambios importantes de temperatura que puedan afectar al estado físico del agente químico. • En los procesos en los que una fracción significativa del vapor puede disolverse o adsorberse en las partículas de otra sustancia, a semejanza de lo que ocurre con los agentes solubles en agua en ambientes con humedad elevada).
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
USA - ACGIH - Occupational Exposure Limits	
Local name	Citral
ACGIH OEL TWA	5 ppm (IFV - Inhalable fraction and vapor)
Remark (ACGIH)	TLV® Basis: Body weight eff; URT irr; eye dam. Notations: Skin; DSEN; A4 (Not classifiable as a Human Carcinogen)
Regulatory reference	ACGIH 2024
D-LIMONENE (5989-27-5)	
Germany - Occupational Exposure Limits (TRGS 900)	
Local name	(R)-p-Mentha-1,8-dien (D-Limonen)
AGW (OEL TWA)	28 mg/m ³ 5 ppm
Peak exposure limitation factor	4(II)
Remark	DFG,H,Sh,Y
Regulatory reference	TRGS900

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D-LIMONENE (5989-27-5)	
Spain - Occupational Exposure Limits	
Local name	d-Limoneno
VLA-ED (OEL TWA)	168 mg/m ³ d-Limoneno 30 ppm d-Limoneno
Remark	Entrada en vigor en 2018. Sen (Sensibilizante. Véase Apartado 6), 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).
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
PINENE (80-56-8)	
Belgium - Occupational Exposure Limits	
Local name	Essence de térébenthine et monoterpènes sélectionés # Terpentijn en geselecteerde monoterpene
OEL TWA	20 ppm
Regulatory reference	Koninklijk besluit/Arrêté royal 16/11/2023
Spain - Occupational Exposure Limits	
Local name	α-pineno (monoterpeno)
VLA-ED (OEL TWA)	113 mg/m ³ 20 ppm
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
BETA-PINENE (127-91-3)	
Belgium - Occupational Exposure Limits	
Local name	Essence de térébenthine et monoterpènes sélectionés # Terpentijn en geselecteerde monoterpene
OEL TWA	20 ppm
Regulatory reference	Koninklijk besluit/Arrêté royal 16/11/2023
Spain - Occupational Exposure Limits	
Local name	β-pineno (monoterpeno)
VLA-ED (OEL TWA)	113 mg/m ³ 20 ppm
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT

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

No additional information available

8.1.5. Control banding

No additional information available

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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:

Wear recommended personal protective equipment.

Personal protective equipment symbol(s):



8.2.2.1. Eye and face protection

Eye protection:

Safety glasses

8.2.2.2. Skin protection

Skin and body protection:

Wear suitable protective clothing

Hand protection:

Protective gloves

8.2.2.3. Respiratory protection

Respiratory protection:

In case of insufficient ventilation, wear suitable respiratory equipment. [In case of inadequate ventilation] wear respiratory protection.

8.2.2.4. Thermal hazards

No additional information available

8.2.3. Environmental exposure controls

Environmental exposure controls:

Avoid release to the environment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Colour	: Not available
Odour	: Not available
Odour threshold	: Not available
Melting point	: Not applicable
Freezing point	: Not available
Boiling point	: Not available
Flammability	: Not applicable, Flammable liquid and vapour.
Lower explosion limit	: Not available
Upper explosion limit	: Not available
Flash point	: 48 °C
Auto-ignition temperature	: Not available
Decomposition temperature	: Not available
pH	: Not available
Viscosity, kinematic	: Not available
Solubility	: Insoluble.
Partition coefficient n-octanol/water (Log Kow)	: Not available
Vapour pressure	: Not available
Vapour pressure at 50°C	: Not available

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Density	: Not available
Relative density	: 0.848 (0.84 – 0.857)
Relative vapour density at 20°C	: Not available
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

VOC content	: 87.3 %
Refractive index	: 1.474 (1.462 – 1.479)

SECTION 10: Stability and reactivity

10.1. Reactivity

Flammable liquid and vapour.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

Avoid contact with hot surfaces. Heat. No flames, no sparks. Eliminate all sources of ignition.

10.5. Incompatible materials

No additional information available

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

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

Acute toxicity (oral)	: Not classified
Acute toxicity (dermal)	: Not classified
Acute toxicity (inhalation)	: Not classified

CITRAL (5392-40-5)	
LD50 oral rat	≈ 6800 mg/kg bodyweight Animal: rat
LD50 dermal rat	> 2000 mg/kg bodyweight Animal: rat, Remarks on results: other:
D-LIMONENE (5989-27-5)	
LD50 oral rat	> 2000 mg/kg bodyweight (OECD 423: Acute Oral Toxicity – Acute Toxic Class Method, Rat, Female, Experimental value, Oral, 14 day(s))
LD50 dermal rabbit	> 5000 mg/kg bodyweight (Equivalent or similar to OECD 402, 24 h, Rabbit, Read-across, Dermal, 7 day(s))
BETA-MYRCENE (123-35-3)	
LD50 oral rat	> 11390 mg/kg bodyweight Animal: rat
LD50 oral	> 3380 mg/kg bodyweight Animal: mouse

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BETA-MYRCENE (123-35-3)	
LD50 dermal rabbit	> 5000 mg/kg bodyweight Animal: rabbit, Guideline: OECD Guideline 402 (Acute Dermal Toxicity)
PINENE (80-56-8)	
LD50 oral rat	> 500 mg/kg bodyweight (OECD 423: Acute Oral Toxicity – Acute Toxic Class Method, Rat, Female, Experimental value, Oral, 01 day(s))
LD50 dermal rat	> 2000 mg/kg bodyweight (OECD 402: Acute Dermal Toxicity, 24 h, Rat, Male / female, Experimental value, Skin, 14 day(s))
BETA-PINENE (127-91-3)	
LD50 oral rat	4700 mg/kg (Rat, Oral)
TERPINOLENE (586-62-9)	
LD50 oral rat	4390 mg/kg (Rat)
LD50 oral	3775 mg/kg bodyweight
LD50 dermal rabbit	> 5000 mg/kg (Rabbit)
GAMMA-TERPINENE (99-85-4)	
LD50 oral	3650 mg/kg bodyweight
P-CYMENE (99-87-6)	
LD50 oral rat	4750 mg/kg (Rat, Male / female, Experimental value, Oral, 14 day(s))
LD50 oral	4750 mg/kg bodyweight
LD50 dermal rabbit	> 5000 mg/kg (Rabbit, Experimental value, Dermal, 14 day(s))
LC50 Inhalation - Rat	> 9.7 mg/l (5 h, Rat, Experimental value, Inhalation)
LC50 Inhalation - Rat (Vapours)	9.7 mg/l/4h
ALPHA-TERPINENE (99-86-5)	
LD50 oral	1680 mg/kg bodyweight
I-.BETA-BISABOLENE* (495-61-4)	
LC50 Inhalation - Rat (Dust/Mist)	1.5 mg/l/4h
Skin corrosion/irritation	: Causes skin irritation.
Serious eye damage/irritation	: Not classified
Respiratory or skin sensitisation	: May cause an allergic skin reaction.
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
BETA-MYRCENE (123-35-3)	
IARC group	2B - Possibly carcinogenic to humans
CITRAL (5392-40-5)	
NOAEL (chronic, oral, animal/male, 2 years)	60 mg/kg bodyweight Animal: mouse, Animal sex: male, Guideline: OECD Guideline 453 (Combined Chronic Toxicity / Carcinogenicity Studies), Remarks on results: other:
Reproductive toxicity	: Suspected of damaging fertility or the unborn child.
STOT-single exposure	: Not classified
STOT-repeated exposure	: Not classified
CITRAL (5392-40-5)	
LOAEC (inhalation, rat, gas, 90 days)	68 ppm Animal: rat, Animal sex: female

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CITRAL (5392-40-5)	
NOAEL (oral, rat, 90 days)	100 mg/kg bodyweight Animal: rat, Guideline: OECD Guideline 453 (Combined Chronic Toxicity / Carcinogenicity Studies)
NOAEC (inhalation, rat, gas, 90 days)	34 ppm Animal: rat, Animal sex: female
NOAEL (subchronic, oral, animal/male, 90 days)	60 mg/kg bodyweight Animal: mouse, Animal sex: male, Guideline: OECD Guideline 453 (Combined Chronic Toxicity / Carcinogenicity Studies)

BETA-MYRCENE (123-35-3)	
LOAEL (oral, rat, 90 days)	250 mg/kg bodyweight Animal: rat, Guideline: OECD Guideline 408 (Repeated Dose 90-Day Oral Toxicity Study in Rodents)
NOAEL (subchronic, oral, animal/male, 90 days)	500 mg/kg bodyweight Animal: mouse, Animal sex: male, Guideline: OECD Guideline 408 (Repeated Dose 90-Day Oral Toxicity Study in Rodents)
NOAEL (subchronic, oral, animal/female, 90 days)	250 mg/kg bodyweight Animal: mouse, Animal sex: female, Guideline: OECD Guideline 408 (Repeated Dose 90-Day Oral Toxicity Study in Rodents)

Aspiration hazard : May be fatal if swallowed and enters airways.

D-LIMONENE (5989-27-5)	
Viscosity, kinematic	No data available in the literature

PINENE (80-56-8)	
Viscosity, kinematic	No data available in the literature

BETA-PINENE (127-91-3)	
Viscosity, kinematic	2.5 mm ² /s (20 °C, Calculated)

P-CYMENE (99-87-6)	
Viscosity, kinematic	1.03 mm ² /s (20 °C, OECD 114: Viscosity of Liquids)

11.2. Information on other hazards

No additional information available

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : Toxic to aquatic life with long lasting effects. Very toxic to aquatic life with long lasting effects.

Hazardous to the aquatic environment, short-term (acute) : Very toxic to aquatic life.

Hazardous to the aquatic environment, long-term (chronic) : Very toxic to aquatic life with long lasting effects.

CITRAL (5392-40-5)	
LC50 - Fish [1]	6.78 mg/l Test organisms (species): Leuciscus idus
EC50 - Crustacea [1]	6.8 mg/l Test organisms (species): Daphnia magna
EC50 72h - Algae [1]	103.8 mg/l Test organisms (species): Desmodesmus subspicatus (previous name: Scenedesmus subspicatus)

D-LIMONENE (5989-27-5)	
LC50 - Fish [1]	720 µg/l (Equivalent or similar to OECD 203, 96 h, Pimephales promelas, Flow-through system, Fresh water, Experimental value)
LC50 - Fish [2]	702 µg/l Test organisms (species): Pimephales promelas

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D-LIMONENE (5989-27-5)	
EC50 - Crustacea [1]	0.307 mg/l (OECD 202: Daphnia sp. Acute Immobilisation Test, 48 h, Daphnia magna, Semi-static system, Fresh water, Experimental value, GLP)
EC50 - Crustacea [2]	0.51 mg/l Test organisms (species): Daphnia magna
EC50 72h - Algae [1]	0.32 mg/l Test organisms (species): Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata, Selenastrum capricornutum)
EC50 72h - Algae [2]	0.214 mg/l Test organisms (species): Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata, Selenastrum capricornutum)
BETA-MYRCENE (123-35-3)	
EC50 - Crustacea [1]	1.47 mg/l Test organisms (species): Daphnia magna
EC50 72h - Algae [1]	0.342 mg/l Test organisms (species): Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata, Selenastrum capricornutum)
EC50 72h - Algae [2]	0.31 mg/l Test organisms (species): Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata, Selenastrum capricornutum)
PINENE (80-56-8)	
LC50 - Fish [1]	0.303 mg/l (OECD 203: Fish, Acute Toxicity Test, 96 h, Danio rerio, Semi-static system, Fresh water, Experimental value, GLP)
EC50 - Crustacea [1]	0.475 mg/l (OECD 202: Daphnia sp. Acute Immobilisation Test, 48 h, Daphnia magna, Semi-static system, Fresh water, Experimental value, Locomotor effect)
BETA-PINENE (127-91-3)	
LC50 - Fish [1]	0.557 mg/l (OECD 203: Fish, Acute Toxicity Test, 96 h, Cyprinus carpio, Semi-static system, Fresh water, Weight of evidence, Other isomer)
ErC50 algae	0.826 mg/l (OECD 201: Alga, Growth Inhibition Test, 48 h, Pseudokirchneriella subcapitata, Static system, Fresh water, Weight of evidence, Other isomer)
P-CYMENE (99-87-6)	
LC50 - Fish [1]	48 mg/l (EPA OPPTS 850.1075, 96 h, Cyprinodon variegatus, Static system, Salt water, Experimental value)
EC50 - Crustacea [1]	3.7 mg/l (OECD 202: Daphnia sp. Acute Immobilisation Test, 48 h, Daphnia magna, Semi-static system, Fresh water, Experimental value, GLP)
EC50 72h - Algae [1]	4.03 mg/l (OECD 201: Alga, Growth Inhibition Test, Selenastrum capricornutum, Static system, Fresh water, Experimental value, GLP)
12.2. Persistence and degradability	
LEMON CALIFORNIA OIL (N/A)	
Persistence and degradability	Rapidly degradable
CITRAL (5392-40-5)	
Persistence and degradability	Rapidly degradable
NERYL ACETATE (141-12-8)	
Persistence and degradability	Rapidly degradable
D-LIMONENE (5989-27-5)	
Persistence and degradability	Readily biodegradable in water.
ThOD	3.29 g O ₂ /g substance

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BETA-MYRCENE (123-35-3)	
Persistence and degradability	Readily biodegradable in water.
PINENE (80-56-8)	
Persistence and degradability	Readily biodegradable in water.
BETA-PINENE (127-91-3)	
Persistence and degradability	Readily biodegradable in water.
TERPINOLENE (586-62-9)	
Persistence and degradability	Forming sediments in water,Biodegradability in soil: no data available,Adsorbs into the soil.
ThOD	3.294 g O ₂ /g substance
GAMMA-TERPINENE (99-85-4)	
Persistence and degradability	Rapidly degradable
P-CYMENE (99-87-6)	
Persistence and degradability	Readily biodegradable in water.
ALPHA-TERPINENE (99-86-5)	
Persistence and degradability	Rapidly degradable
I-.BETA-BISABOLENE* (495-61-4)	
Persistence and degradability	Rapidly degradable
BETA-CARYOPHYLLENE (87-44-5)	
Persistence and degradability	Rapidly degradable
GERANYL ACETATE (105-87-3)	
Persistence and degradability	Rapidly degradable
12.3. Bioaccumulative potential	
D-LIMONENE (5989-27-5)	
BCF - Fish [1]	864.8 l/kg (BCFBAF v3.01, Pisces, QSAR, Fresh weight)
Partition coefficient n-octanol/water (Log Pow)	4.38 (Experimental value, Equivalent or similar to OECD 117, 37 °C)
Bioaccumulative potential	Potential for bioaccumulation (4 ≤ Log Kow ≤ 5).
BETA-MYRCENE (123-35-3)	
Partition coefficient n-octanol/water (Log Pow)	5.285 (Literature, 25 °C)
Bioaccumulative potential	High potential for bioaccumulation (Log Kow > 5).
PINENE (80-56-8)	
BCF - Other aquatic organisms [1]	1233.1 – 1248 l/kg (BCFBAF v3.01, Read-across, Fresh weight)
Partition coefficient n-octanol/water (Log Pow)	4.487 (Experimental value, Equivalent or similar to OECD 107, 25 °C)
Bioaccumulative potential	Potential for bioaccumulation (500 ≤ BCF ≤ 5000).
BETA-PINENE (127-91-3)	
BCF - Fish [1]	1125 l/kg (BCFBAF v3.01, Pisces, Fresh water, QSAR, Other isomer)
Partition coefficient n-octanol/water (Log Pow)	4.425 (Similar product, Read-across, Equivalent or similar to OECD 107, 25 °C)

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BETA-PINENE (127-91-3)	
Bioaccumulative potential	Potential for bioaccumulation ($4 \leq \text{Log Kow} \leq 5$).
TERPINOLENE (586-62-9)	
Partition coefficient n-octanol/water (Log Pow)	4.23
P-CYMENE (99-87-6)	
Partition coefficient n-octanol/water (Log Pow)	4.8 (Experimental value, OECD 117: Partition Coefficient (n-octanol/water), HPLC method, 20 °C)
Bioaccumulative potential	Potential for bioaccumulation ($4 \leq \text{Log Kow} \leq 5$).

12.4. Mobility in soil

D-LIMONENE (5989-27-5)	
Surface tension	No data available in the literature
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	3.049 – 3.801 (log Koc, SRC PCKOCWIN v2.0, Calculated value)
Ecology - soil	Low potential for mobility in soil.
BETA-MYRCENE (123-35-3)	
Ecology - soil	No (test)data on mobility of the substance available.
PINENE (80-56-8)	
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	3.009 – 3.853 (log Koc, SRC PCKOCWIN v2.0, Calculated value)
Ecology - soil	Low potential for mobility in soil. May be harmful to plant growth, blooming and fruit formation.
BETA-PINENE (127-91-3)	
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	3.009 – 3.836 (log Koc, Calculated value, Other isomer)
Ecology - soil	Low potential for mobility in soil.
P-CYMENE (99-87-6)	
Surface tension	No data available in the literature
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	4.17 (log Koc, SRC PCKOCWIN v2.0, QSAR)
Ecology - soil	Low potential for mobility in soil.

12.5. Results of PBT and vPvB assessment

Component	
Substance(s) not meeting the PBT criteria of REACH regulation, in accordance with Annex XIII	D-LIMONENE (5989-27-5), PINENE (80-56-8), BETA-PINENE (127-91-3), P-CYMENE (99-87-6)
Substance(s) not meeting the vPvB criteria of REACH regulation, in accordance with Annex XIII	D-LIMONENE (5989-27-5), PINENE (80-56-8), BETA-PINENE (127-91-3), P-CYMENE (99-87-6)

12.6. Endocrine disrupting properties

No additional information available

12.7. Other adverse effects

No additional information available

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SECTION 13: Disposal considerations

13.1. Waste treatment methods

Regional waste regulation	: Disposal must be done according to official regulations.
Waste treatment methods	: Dispose of contents/container in accordance with licensed collector's sorting instructions.
Sewage disposal recommendations	: Disposal must be done according to official regulations.
Product/Packaging disposal recommendations	: Disposal must be done according to official regulations.
Additional information	: Flammable vapours may accumulate in the container. Do not re-use empty containers.

SECTION 14: Transport information

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

14.1. UN number or ID number

UN-No. (ADR)	: UN 1197
UN-No. (IMDG)	: UN 1197
UN-No. (IATA)	: UN 1197
UN-No. (ADN)	: UN 1197
UN-No. (RID)	: UN 1197

14.2. UN proper shipping name

Proper Shipping Name (ADR)	: EXTRACTS, LIQUID
Proper Shipping Name (IMDG)	: EXTRACTS, LIQUID
Proper Shipping Name (IATA)	: Extracts, liquid
Proper Shipping Name (ADN)	: EXTRACTS, LIQUID
Proper Shipping Name (RID)	: EXTRACTS, LIQUID
Transport document description (ADR)	: UN 1197 EXTRACTS, LIQUID, 3, III, (D/E)
Transport document description (IMDG)	: UN 1197 EXTRACTS, LIQUID, 3, III, MARINE POLLUTANT/ENVIRONMENTALLY HAZARDOUS
Transport document description (IATA)	: UN 1197 Extracts, liquid, 3, III, ENVIRONMENTALLY HAZARDOUS
Transport document description (ADN)	: UN 1197 EXTRACTS, LIQUID, 3, III, ENVIRONMENTALLY HAZARDOUS
Transport document description (RID)	: UN 1197 EXTRACTS, LIQUID, 3, III, ENVIRONMENTALLY HAZARDOUS

14.3. Transport hazard class(es)

ADR

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



IMDG

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



IATA

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



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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) : III
Packing group (IMDG) : III
Packing group (IATA) : III
Packing group (ADN) : III
Packing group (RID) : III

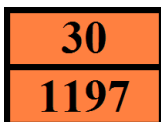
14.5. Environmental hazards

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

14.6. Special precautions for user

Overland transport

Classification code (ADR) : F1
Special provisions (ADR) : 601
Limited quantities (ADR) : 5I
Excepted quantities (ADR) : E1
Packing instructions (ADR) : P001, IBC03, LP01, R001
Mixed packing provisions (ADR) : MP19
Portable tank and bulk container instructions (ADR) : T2
Portable tank and bulk container special provisions (ADR) : TP1
Tank code (ADR) : LGBF
Vehicle for tank carriage : FL
Transport category (ADR) : 3
Special provisions for carriage - Packages (ADR) : V12
Special provisions for carriage - Operation (ADR) : S2
Hazard identification number (Kemler No.) : 30
Orange plates :



Tunnel restriction code (ADR) : D/E
EAC code : 3Y

Transport by sea

Special provisions (IMDG) : 223, 955
Limited quantities (IMDG) : 5 L
Excepted quantities (IMDG) : E1
Packing instructions (IMDG) : P001, LP01
IBC packing instructions (IMDG) : IBC03
Tank instructions (IMDG) : T2
Tank special provisions (IMDG) : TP1

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EmS-No. (Fire) : F-E
EmS-No. (Spillage) : S-D
Stowage category (IMDG) : A
Properties and observations (IMDG) : Usually consist of alcoholic solutions. Miscibility with water depends upon the composition.

Air transport

PCA Excepted quantities (IATA) : E1
PCA Limited quantities (IATA) : Y344
PCA limited quantity max net quantity (IATA) : 10L
PCA packing instructions (IATA) : 355
PCA max net quantity (IATA) : 60L
CAO packing instructions (IATA) : 366
CAO max net quantity (IATA) : 220L
Special provisions (IATA) : A3
ERG code (IATA) : 3L

Inland waterway transport

Classification code (ADN) : F1
Special provisions (ADN) : 601
Limited quantities (ADN) : 5 L
Excepted quantities (ADN) : E1
Equipment required (ADN) : PP, EX, A
Ventilation (ADN) : VE01
Number of blue cones/lights (ADN) : 0

Rail transport

Classification code (RID) : F1
Special provisions (RID) : 601
Limited quantities (RID) : 5L
Excepted quantities (RID) : E1
Packing instructions (RID) : P001, IBC03, LP01, R001
Mixed packing provisions (RID) : MP19
Portable tank and bulk container instructions (RID) : T2
Portable tank and bulk container special provisions (RID) : TP1
Tank codes for RID tanks (RID) : LGBF
Transport category (RID) : 3
Special provisions for carriage – Packages (RID) : W12
Colis express (express parcels) (RID) : CE4
Hazard identification number (RID) : 30

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

REACH Annex XVII (Restriction List)

EU restriction list (REACH Annex XVII)	
Reference code	Applicable on
3(a)	LEMON CALIFORNIA OIL ; D-LIMONENE ; BETA-MYRCENE ; PINENE ; BETA-PINENE ; TERPINOLENE ; GAMMA-TERPINENE ; P-CYMENE ; ALPHA-TERPINENE
3(b)	LEMON CALIFORNIA OIL ; CITRAL ; D-LIMONENE ; BETA-MYRCENE ; PINENE ; BETA-PINENE ; TERPINOLENE ; GAMMA-TERPINENE ; P-CYMENE ; ALPHA-TERPINENE ; I-.BETA-BISABOLENE* ; BETA-CARYOPHYLLENE ; GERANYL ACETATE ; NERYL ACETATE

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EU restriction list (REACH Annex XVII)	
Reference code	Applicable on
3(c)	LEMON CALIFORNIA OIL ; D-LIMONENE ; BETA-MYRCENE ; PINENE ; BETA-PINENE ; TERPINOLENE ; GAMMA-TERPINENE ; P-CYMENE ; ALPHA-TERPINENE ; I-.BETA-BISABOLENE* ; GERANYL ACETATE
40.	D-LIMONENE ; BETA-MYRCENE ; PINENE ; BETA-PINENE ; TERPINOLENE ; GAMMA-TERPINENE ; P-CYMENE ; ALPHA-TERPINENE

REACH Annex XIV (Authorisation List)

Contains no substance(s) listed on REACH Annex XIV (Authorisation List)

REACH Candidate List (SVHC)

Contains no substance(s) listed on the REACH Candidate List

PIC Regulation (Prior Informed Consent)

Contains no substance(s) listed on the PIC list (Regulation EU 649/2012 concerning the export and import of hazardous chemicals)

POP Regulation (Persistent Organic Pollutants)

Contains no substance(s) listed on the POP list (Regulation EU 2019/1021 on persistent organic pollutants)

Ozone Regulation (1005/2009)

Contains no substance(s) listed on the Ozone Depletion list (Regulation EU 1005/2009 on substances that deplete the ozone layer)

Dual-Use Regulation (428/2009)

Contains no substance subject to the COUNCIL REGULATION (EC) No 428/2009 of 5 May 2009 setting up a Community regime for the control of exports, transfer, brokering and transit of dual-use items.

VOC Directive (2004/42)

VOC content : 87.3 %

Explosives Precursors Regulation (2019/1148)

Contains no substance(s) listed on the Explosives Precursors list (Regulation EU 2019/1148 on the marketing and use of explosives precursors)

Drug Precursors Regulation (273/2004)

Contains no substance(s) listed on the Drug Precursors list (Regulation EC 273/2004 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

Not listed on the United States TSCA (Toxic Substances Control Act) inventory

Listed on the Canadian DSL (Domestic Substances List)

Germany

Water hazard class (WGK) : Not classified according to Regulation Governing Systems for Handling Substances Hazardous to Waters (AwSV).

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

Netherlands

SZW-lijst van kankerverwekkende stoffen : None of the components are listed

SZW-lijst van mutagene stoffen : None of the components are listed

SZW-lijst van reprotoxische stoffen – Borstvoeding : None of the components are listed

SZW-lijst van reprotoxische stoffen –

Vruchtbaarheid

SZW-lijst van reprotoxische stoffen – Ontwikkeling : None of the components are listed

Denmark

Class for fire hazard : Class II-1

Store unit : 5 liter

Classification remarks : R10 <H226;H304;H315;H317;H361;H410>; 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

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15.2. Chemical safety assessment

No chemical safety assessment has been carried out

SECTION 16: Other information

Abbreviations and acronyms:

CLP	Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006
WGK	Water Hazard Class
ADN	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	Median effective concentration
EN	European Standard
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
LC50	Median lethal concentration
LD50	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	Regulations concerning the International Carriage of Dangerous Goods by Rail
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

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Abbreviations and acronyms:

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. 3 (Inhalation)	Acute toxicity (inhal.), Category 3
Acute Tox. 3 (Inhalation:vapour)	Acute toxicity (inhalation:vapour) Category 3
Acute Tox. 4 (Inhalation)	Acute toxicity (inhal.), Category 4
Acute Tox. 4 (Oral)	Acute toxicity (oral), Category 4
Aquatic Acute 1	Hazardous to the aquatic environment – Acute Hazard, Category 1
Aquatic Chronic 1	Hazardous to the aquatic environment – Chronic Hazard, Category 1
Aquatic Chronic 2	Hazardous to the aquatic environment – Chronic Hazard, Category 2
Aquatic Chronic 3	Hazardous to the aquatic environment – Chronic Hazard, Category 3
Asp. Tox. 1	Aspiration hazard, Category 1
Eye Irrit. 2	Serious eye damage/eye irritation, Category 2
Flam. Liq. 3	Flammable liquids, Category 3
H226	Flammable liquid and vapour.
H302	Harmful if swallowed.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H331	Toxic if inhaled.
H332	Harmful if inhaled.
H361	Suspected of damaging fertility or the unborn child.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H411	Toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.
Repr. 2	Reproductive toxicity, Category 2
Skin Irrit. 2	Skin corrosion/irritation, Category 2
Skin Sens. 1	Skin sensitisation, Category 1
Skin Sens. 1B	Skin sensitisation, category 1B

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.