

Safety data sheet

acc. to Safe Work Australia - Code of Practice



Oil of bergamot , artificial

article number: **3282**
Version: **GHS 2.0 en**
Replaces version of: 2021-08-26
Version: (GHS 1)

date of compilation: 2021-08-26
Revision: 2021-10-14

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

1.1 Product identifier

Identification of the substance **Oil of bergamot , artificial**
Article number 3282

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

Relevant identified uses: Laboratory chemical
Laboratory and analytical use
Uses advised against: Do not use for products which come into contact with foodstuffs. Do not use for private purposes (household).

1.3 Details of the supplier of the safety data sheet

Carl Roth GmbH + Co KG
Schoemperlenstr. 3-5
D-76185 Karlsruhe
Germany

Telephone:+49 (0) 721 - 56 06 0
Telefax: +49 (0) 721 - 56 06 149
e-mail: sicherheit@carlroth.de
Website: www.carlroth.de

Competent person responsible for the safety data sheet: :Department Health, Safety and Environment

e-mail (competent person): **sicherheit@carlroth.de**

1.4 Emergency telephone number

Name	Street	Postal code/city	Telephone	Website
NSW Poisons Information Centre Childrens Hospital	Hawkesbury Road	2145 Westmead, NSW	131126	

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification acc. to GHS

Section	Hazard class	Cat-egory	Hazard class and category	Hazard statement
2.6	Flammable liquid	3	Flam. Liq. 3	H226
3.2	Skin corrosion/irritation	2	Skin Irrit. 2	H315
3.3	Serious eye damage/eye irritation	2A	Eye Irrit. 2A	H319
3.4S	Skin sensitisation	1	Skin Sens. 1	H317
3.10	Aspiration hazard	1	Asp. Tox. 1	H304

For full text of abbreviations: see SECTION 16

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The most important adverse physicochemical, human health and environmental effects

The product is combustible and can be ignited by potential ignition sources.

2.2 Label elements

Labelling

Signal word

Danger

Pictograms

GHS02, GHS07,
GHS08



Hazard statements

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
H319	Causes serious eye irritation

Precautionary statements

Precautionary statements - prevention

P210	Keep away from heat/sparks/open flames/hot surfaces. - No smoking
P280	Wear protective gloves

Precautionary statements - response

P301+P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
P302+P352	IF ON SKIN: Wash with plenty of soap and water
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P331	Do NOT induce vomiting
P370+P378	In case of fire: Use sand, carbon dioxide or powder extinguisher for extinction

Precautionary statements - storage

P403+P235	Store in a well-ventilated place. Keep cool
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Hazardous ingredients for labelling:

Acetic acid linalyl ester, D-(+)-Limonene, Linalool, DL- α -Pinene, β -Pinene, Geranial, Myrcene, Neral, Terpinolene

2.3 Other hazards

Results of PBT and vPvB assessment

This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

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SECTION 3: Composition/information on ingredients

3.1 Substances

not relevant (mixture)

3.2 Mixtures

Description of the mixture

Name of sub-stance	Identifier	Wt%	Classification acc. to GHS	Pictograms	Notes
Acetic acid linalyl ester	CAS No 115-95-7	25 – < 50	Flam. Liq. 4 / H227 Skin Irrit. 2 / H315 Eye Irrit. 2A / H319 Skin Sens. 1 / H317		
D-(+)-Limonene	CAS No 5989-27-5	10 – < 25	Flam. Liq. 3 / H226 Skin Irrit. 2 / H315 Skin Sens. 1B / H317 Asp. Tox. 1 / H304		
Linalool	CAS No 78-70-6	10 – < 25	Flam. Liq. 4 / H227 Skin Irrit. 2 / H315 Eye Irrit. 2A / H319 Skin Sens. 1B / H317		
β-Pinene	CAS No 127-91-3	1 – < 5	Flam. Liq. 3 / H226 Skin Irrit. 2 / H315 Skin Sens. 1B / H317 Asp. Tox. 1 / H304		
γ-Terpinene	CAS No 99-85-4	1 – < 3	Flam. Liq. 3 / H226 Repr. 2 / H361fd		
Geranial	CAS No 141-27-5	< 1	Skin Irrit. 2 / H315 Eye Irrit. 2A / H319 Skin Sens. 1B / H317		
Neral	CAS No 106-26-3	< 1	Skin Irrit. 2 / H315 Eye Irrit. 2A / H319 Skin Sens. 1 / H317		
Myrcene	CAS No 123-35-3	< 1	Flam. Liq. 3 / H226 Skin Irrit. 2 / H315 Eye Irrit. 2A / H319 Skin Sens. 1 / H317 Asp. Tox. 1 / H304		IARC: 2B
Terpinolene	CAS No 586-62-9	< 1	Flam. Liq. 4 / H227 Skin Sens. 1B / H317 Asp. Tox. 1 / H304		
DL-α-Pinene	CAS No 80-56-8	< 1	Flam. Liq. 3 / H226 Acute Tox. 4 / H302 Skin Irrit. 2 / H315 Skin Sens. 1A / H317 Asp. Tox. 1 / H304		

Notes

IARC: IARC group 2B: possibly carcinogenic to humans (International Agency for Research on Cancer)

2B:

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For full text of abbreviations: see SECTION 16

SECTION 4: First aid measures

4.1 Description of first aid measures



General notes

Take off contaminated clothing.

Following inhalation

Provide fresh air. In all cases of doubt, or when symptoms persist, seek medical advice.

Following skin contact

Rinse skin with water/shower. In all cases of doubt, or when symptoms persist, seek medical advice.

Following eye contact

Irrigate copiously with clean, fresh water for at least 10 minutes, holding the eyelids apart. In case of eye irritation consult an ophthalmologist.

Following ingestion

Call a physician immediately. Observe aspiration hazard if vomiting occurs.

4.2 Most important symptoms and effects, both acute and delayed

Aspiration hazard, Irritation, Allergic reactions

4.3 Indication of any immediate medical attention and special treatment needed

none

SECTION 5: Firefighting measures

5.1 Extinguishing media



Suitable extinguishing media

co-ordinate firefighting measures to the fire surroundings
water spray, dry extinguishing powder, BC-powder, carbon dioxide (CO₂)

Unsuitable extinguishing media

water jet

5.2 Special hazards arising from the substance or mixture

Combustible. In case of insufficient ventilation and/or in use, may form flammable/explosive vapour-air mixture. Solvent vapours are heavier than air and may spread along floors. Places which are not ventilated, e.g. unventilated below ground level areas such as trenches, conduits and shafts, are particularly prone to the presence of flammable substances or mixtures.

Hazardous combustion products

Carbon monoxide (CO), Carbon dioxide (CO₂)

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5.3 Advice for firefighters

In case of fire and/or explosion do not breathe fumes. Fight fire with normal precautions from a reasonable distance. Wear self-contained breathing apparatus.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures



For non-emergency personnel

Do not breathe vapour/spray. Avoid contact with skin and eyes. Avoidance of ignition sources. Provide adequate ventilation.

6.2 Environmental precautions

Keep away from drains, surface and ground water. Danger of explosion.

6.3 Methods and material for containment and cleaning up

Advice on how to contain a spill

Covering of drains.

Advice on how to clean up a spill

Absorb with liquid-binding material (sand, diatomaceous earth, acid- or universal binding agents).

Other information relating to spills and releases

Place in appropriate containers for disposal. Ventilate affected area.

6.4 Reference to other sections

Hazardous combustion products: see section 5. Personal protective equipment: see section 8. Incompatible materials: see section 10. Disposal considerations: see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Provision of sufficient ventilation. When not in use, keep containers tightly closed.

Measures to prevent fire as well as aerosol and dust generation



Keep away from sources of ignition - No smoking.

Take precautionary measures against static discharge.

Advice on general occupational hygiene

Wash hands before breaks and after work. Keep away from food, drink and animal feedingstuffs. When using do not smoke.

7.2 Conditions for safe storage, including any incompatibilities

Store in a well-ventilated place. Keep container tightly closed.

Incompatible substances or mixtures

Observe hints for combined storage.

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Consideration of other advice:

Ground/bond container and receiving equipment.

Ventilation requirements

Use local and general ventilation.

Specific designs for storage rooms or vessels

Recommended storage temperature: 15 – 25 °C

7.3 Specific end use(s)

No information available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

National limit values

Occupational exposure limit values (Workplace Exposure Limits)

This information is not available.

Relevant DNELs of components of the mixture						
Name of substance	CAS No	End-point	Threshold level	Protection goal, route of exposure	Used in	Exposure time
Acetic acid linalyl ester	115-95-7	DNEL	2.75 mg/m ³	human, inhalatory	worker (industry)	chronic - systemic effects
Acetic acid linalyl ester	115-95-7	DNEL	2.5 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects
Acetic acid linalyl ester	115-95-7	DNEL	236.2 µg/cm ²	human, dermal	worker (industry)	chronic - local effects
Acetic acid linalyl ester	115-95-7	DNEL	236.2 µg/cm ²	human, dermal	worker (industry)	acute - local effects
Linalool	78-70-6	DNEL	2.8 mg/m ³	human, inhalatory	worker (industry)	chronic - systemic effects
Linalool	78-70-6	DNEL	16.5 mg/m ³	human, inhalatory	worker (industry)	acute - systemic effects
Linalool	78-70-6	DNEL	2.5 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects
Linalool	78-70-6	DNEL	5 mg/kg bw/day	human, dermal	worker (industry)	acute - systemic effects
D-(+)-Limonene	5989-27-5	DNEL	66.7 mg/m ³	human, inhalatory	worker (industry)	chronic - systemic effects
D-(+)-Limonene	5989-27-5	DNEL	9.5 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects
β-Pinene	127-91-3	DNEL	5.69 mg/m ³	human, inhalatory	worker (industry)	chronic - systemic effects
β-Pinene	127-91-3	DNEL	0.8 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects
β-Pinene	127-91-3	DNEL	54 µg/cm ²	human, dermal	worker (industry)	chronic - local effects
γ-Terpinene	99-85-4	DNEL	2.939 mg/m ³	human, inhalatory	worker (industry)	chronic - systemic effects

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Relevant DNELs of components of the mixture						
Name of substance	CAS No	End-point	Threshold level	Protection goal, route of exposure	Used in	Exposure time
γ-Terpinene	99-85-4	DNEL	0.833 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects
DL-α-Pinene	80-56-8	DNEL	3.8 mg/m ³	human, inhalatory	worker (industry)	chronic - systemic effects
DL-α-Pinene	80-56-8	DNEL	0.542 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects
Neral	106-26-3	DNEL	9 mg/m ³	human, inhalatory	worker (industry)	chronic - systemic effects
Neral	106-26-3	DNEL	1.7 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects
Neral	106-26-3	DNEL	140 µg/cm ²	human, dermal	worker (industry)	chronic - local effects

Relevant PNECs of components of the mixture						
Name of substance	CAS No	End-point	Threshold level	Organism	Environmental compartment	Exposure time
Acetic acid linalyl ester	115-95-7	PNEC	0.011 mg/l	aquatic organisms	freshwater	short-term (single instance)
Acetic acid linalyl ester	115-95-7	PNEC	0.001 mg/l	aquatic organisms	marine water	short-term (single instance)
Acetic acid linalyl ester	115-95-7	PNEC	1 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
Acetic acid linalyl ester	115-95-7	PNEC	0.609 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
Acetic acid linalyl ester	115-95-7	PNEC	0.061 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
Acetic acid linalyl ester	115-95-7	PNEC	0.115 mg/kg	terrestrial organisms	soil	short-term (single instance)
Linalool	78-70-6	PNEC	0.2 mg/l	aquatic organisms	freshwater	short-term (single instance)
Linalool	78-70-6	PNEC	0.02 mg/l	aquatic organisms	marine water	short-term (single instance)
Linalool	78-70-6	PNEC	10 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
Linalool	78-70-6	PNEC	2.22 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
Linalool	78-70-6	PNEC	0.222 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
Linalool	78-70-6	PNEC	0.327 mg/kg	terrestrial organisms	soil	short-term (single instance)
D-(+)-Limonene	5989-27-5	PNEC	14 µg/l	aquatic organisms	freshwater	short-term (single instance)
D-(+)-Limonene	5989-27-5	PNEC	1.4 µg/l	aquatic organisms	marine water	short-term (single instance)

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Relevant PNECs of components of the mixture						
Name of substance	CAS No	End-point	Threshold level	Organism	Environmental compartment	Exposure time
D-(+)-Limonene	5989-27-5	PNEC	1.8 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
D-(+)-Limonene	5989-27-5	PNEC	3.85 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
D-(+)-Limonene	5989-27-5	PNEC	0.385 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
D-(+)-Limonene	5989-27-5	PNEC	0.763 mg/kg	terrestrial organisms	soil	short-term (single instance)
β-Pinene	127-91-3	PNEC	1.004 µg/l	aquatic organisms	freshwater	short-term (single instance)
β-Pinene	127-91-3	PNEC	0.1 µg/l	aquatic organisms	marine water	short-term (single instance)
β-Pinene	127-91-3	PNEC	3.26 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
β-Pinene	127-91-3	PNEC	0.337 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
β-Pinene	127-91-3	PNEC	0.034 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
β-Pinene	127-91-3	PNEC	0.067 mg/kg	terrestrial organisms	soil	short-term (single instance)
γ-Terpinene	99-85-4	PNEC	0.003 mg/l	aquatic organisms	freshwater	short-term (single instance)
γ-Terpinene	99-85-4	PNEC	0 mg/l	aquatic organisms	marine water	short-term (single instance)
γ-Terpinene	99-85-4	PNEC	10 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
γ-Terpinene	99-85-4	PNEC	0.49 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
γ-Terpinene	99-85-4	PNEC	0.049 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
γ-Terpinene	99-85-4	PNEC	0.423 mg/kg	terrestrial organisms	soil	short-term (single instance)
DL-α-Pinene	80-56-8	PNEC	0.606 µg/l	aquatic organisms	freshwater	short-term (single instance)
DL-α-Pinene	80-56-8	PNEC	0.061 µg/l	aquatic organisms	marine water	short-term (single instance)
DL-α-Pinene	80-56-8	PNEC	0.2 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
DL-α-Pinene	80-56-8	PNEC	157 µg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
DL-α-Pinene	80-56-8	PNEC	15.7 µg/kg	aquatic organisms	marine sediment	short-term (single instance)
DL-α-Pinene	80-56-8	PNEC	31.7 µg/kg	terrestrial organisms	soil	short-term (single instance)

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Relevant PNECs of components of the mixture						
Name of substance	CAS No	End-point	Threshold level	Organism	Environmental compartment	Exposure time
Neral	106-26-3	PNEC	0.007 mg/l	aquatic organisms	freshwater	short-term (single instance)
Neral	106-26-3	PNEC	0.001 mg/l	aquatic organisms	marine water	short-term (single instance)
Neral	106-26-3	PNEC	1.6 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
Neral	106-26-3	PNEC	0.125 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
Neral	106-26-3	PNEC	0.013 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
Neral	106-26-3	PNEC	0.021 mg/kg	terrestrial organisms	soil	short-term (single instance)

8.2 Exposure controls

Individual protection measures (personal protective equipment)

Eye/face protection



Use safety goggle with side protection.

Skin protection



• hand protection

Wear suitable gloves. Chemical protection gloves are suitable, which are tested according to EN 374. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves. The times are approximate values from measurements at 22 ° C and permanent contact. Increased temperatures due to heated substances, body heat etc. and a reduction of the effective layer thickness by stretching can lead to a considerable reduction of the breakthrough time. If in doubt, contact manufacturer. At an approx. 1.5 times larger / smaller layer thickness, the respective breakthrough time is doubled / halved. The data apply only to the pure substance. When transferred to substance mixtures, they may only be considered as a guide.

• type of material

NBR (Nitrile rubber)

• material thickness

0,4 mm

• breakthrough times of the glove material

>480 minutes (permeation: level 6)

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• other protection measures

Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended.

Respiratory protection



Respiratory protection necessary at: Aerosol or mist formation. Type: A (against organic gases and vapours with a boiling point of > 65 °C , colour code: Brown).

Environmental exposure controls

Keep away from drains, surface and ground water.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	liquid
Colour	light green
Odour	characteristic
Melting point/freezing point	not determined
Boiling point or initial boiling point and boiling range	not determined
Flammability	flammable liquid in accordance with GHS criteria
Lower and upper explosion limit	not determined
Flash point	57 °C
Auto-ignition temperature	not determined
Decomposition temperature	not relevant
pH (value)	not determined
Kinematic viscosity	not determined
<u>Solubility(ies)</u>	
Water solubility	not determined
<u>Partition coefficient</u>	
Partition coefficient n-octanol/water (log value):	this information is not available
Vapour pressure	not determined
Density	0.88 g/cm ³ at 20 °C
Relative vapour density	information on this property is not available

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Particle characteristics not relevant (liquid)

Other safety parameters

Oxidising properties none

9.2 Other information

Information with regard to physical hazard classes:

Flammable liquids

Sustained combustibility yes, sustained combustion was observed

Other safety characteristics: There is no additional information.

SECTION 10: Stability and reactivity

10.1 Reactivity

The mixture contains reactive substance(s). Risk of ignition.

If heated

Risk of ignition. Vapours may form explosive mixtures with air.

10.2 Chemical stability

The material is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

10.3 Possibility of hazardous reactions

Violent reaction with: strong oxidiser

10.4 Conditions to avoid

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

10.5 Incompatible materials

There is no additional information.

10.6 Hazardous decomposition products

Hazardous combustion products: see section 5.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Test data are not available for the complete mixture.

Classification procedure

The method for classification of the mixture is based on ingredients of the mixture (additivity formula).

Classification acc. to GHS

Acute toxicity

Shall not be classified as acutely toxic.

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Acute toxicity estimate (ATE) of components of the mixture			
Name of substance	CAS No	Exposure route	ATE
DL- α -Pinene	80-56-8	oral	1,000 mg/kg

Acute toxicity of components of the mixture					
Name of substance	CAS No	Exposure route	Endpoint	Value	Species
Acetic acid linalyl ester	115-95-7	oral	LD50	>9,000 mg/kg	rat
Acetic acid linalyl ester	115-95-7	dermal	LD50	>5,000 mg/kg	rabbit
Linalool	78-70-6	oral	LD50	2,790 mg/kg	rat
Linalool	78-70-6	dermal	LD50	5,610 mg/kg	rabbit
D-(+)-Limonene	5989-27-5	oral	LD50	>2,000 mg/kg	rat
β -Pinene	127-91-3	oral	LD50	4,700 mg/kg	rat
γ -Terpinene	99-85-4	oral	LD50	>2,000 mg/kg	rat
γ -Terpinene	99-85-4	dermal	LD50	>2,000 mg/kg	rat
Geranial	141-27-5	oral	LD50	6,800 mg/kg	rat
Geranial	141-27-5	dermal	LD50	>2,000 mg/kg	rat
DL- α -Pinene	80-56-8	dermal	LD50	>2,000 mg/kg	rat
DL- α -Pinene	80-56-8	oral	LD50	3,700 mg/kg	rat
Myrcene	123-35-3	oral	LD50	>3,380 mg/kg	mouse
Myrcene	123-35-3	dermal	LD50	>5,000 mg/kg	rabbit
Neral	106-26-3	oral	LD50	6,800 mg/kg	rat
Neral	106-26-3	dermal	LD50	>2,000 mg/kg	rat
Terpinolene	586-62-9	oral	LD50	>2,000 mg/kg	rat
Terpinolene	586-62-9	dermal	LD50	>2,000 mg/kg	rat

Skin corrosion/irritation

Causes skin irritation.

Serious eye damage/eye irritation

Causes serious eye irritation.

Respiratory or skin sensitisation

May cause an allergic skin reaction.

Germ cell mutagenicity

Shall not be classified as germ cell mutagenic.

Carcinogenicity

Shall not be classified as carcinogenic.

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Reproductive toxicity

Shall not be classified as a reproductive toxicant.

Specific target organ toxicity - single exposure

Shall not be classified as a specific target organ toxicant (single exposure).

Specific target organ toxicity - repeated exposure

Shall not be classified as a specific target organ toxicant (repeated exposure).

Aspiration hazard

May be fatal if swallowed and enters airways.

Symptoms related to the physical, chemical and toxicological characteristics

• If swallowed

aspiration hazard

• If in eyes

Causes serious eye irritation

• If inhaled

Data are not available.

• If on skin

causes skin irritation, May produce an allergic reaction, pruritis, localised redness

• Other information

none

11.2 Endocrine disrupting properties

None of the ingredients are listed.

SECTION 12: Ecological information

12.1 Toxicity

Very toxic to aquatic life with long lasting effects.

Aquatic toxicity (acute) of components of the mixture					
Name of substance	CAS No	Endpoint	Value	Species	Exposure time
Acetic acid linalyl ester	115-95-7	ErC50	62 mg/l	algae	72 h
Acetic acid linalyl ester	115-95-7	LC50	11 mg/l	fish	96 h
Acetic acid linalyl ester	115-95-7	EC50	59 mg/l	aquatic invertebrates	48 h
Linalool	78-70-6	LC50	27.8 mg/l	fish	96 h
Linalool	78-70-6	EC50	59 mg/l	aquatic invertebrates	48 h
Linalool	78-70-6	ErC50	156.7 mg/l	algae	96 h
D-(+)-Limonene	5989-27-5	LC50	0.46 mg/l	fish	96 h
D-(+)-Limonene	5989-27-5	EC50	0.307 mg/l	aquatic invertebrates	48 h
D-(+)-Limonene	5989-27-5	ErC50	0.32 mg/l	algae	72 h

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Aquatic toxicity (acute) of components of the mixture					
Name of substance	CAS No	Endpoint	Value	Species	Exposure time
β -Pinene	127-91-3	LC50	0.68 mg/l	rainbow trout (<i>Oncorhynchus mykiss</i>)	96 h
β -Pinene	127-91-3	EC50	1.09 mg/l	daphnia magna	48 h
β -Pinene	127-91-3	ErC50	0.7 mg/l	<i>Pseudokirchneriella subcapitata</i>	72 h
γ -Terpinene	99-85-4	EC50	2.792 mg/l	fish	96 h
Geranial	141-27-5	LC50	6.78 mg/l	fish	96 h
Geranial	141-27-5	EC50	6.8 mg/l	aquatic invertebrates	48 h
Geranial	141-27-5	ErC50	103.8 mg/l	algae	72 h
DL- α -Pinene	80-56-8	LC50	0.303 mg/l	fish	96 h
DL- α -Pinene	80-56-8	EC50	0.475 mg/l	aquatic invertebrates	48 h
Myrcene	123-35-3	EC50	1.47 mg/l	aquatic invertebrates	48 h
Myrcene	123-35-3	EC50	0.31 mg/l	algae	72 h
Myrcene	123-35-3	ErC50	0.342 mg/l	algae	72 h
Neral	106-26-3	LC50	6.78 mg/l	fish	96 h
Neral	106-26-3	EC50	6.8 mg/l	aquatic invertebrates	48 h
Neral	106-26-3	ErC50	103.8 mg/l	algae	72 h
Terpinolene	586-62-9	LC50	0.805 mg/l	fish	96 h
Terpinolene	586-62-9	EC50	0.634 mg/l	aquatic invertebrates	48 h
Terpinolene	586-62-9	ErC50	0.692 mg/l	algae	72 h

Aquatic toxicity (chronic) of components of the mixture					
Name of substance	CAS No	Endpoint	Value	Species	Exposure time
Acetic acid linalyl ester	115-95-7	LC50	11.14 mg/l	fish	20 h
Linalool	78-70-6	EC50	>100 mg/l	microorganisms	30 min
D-(+)-Limonene	5989-27-5	EC50	<0.67 mg/l	fish	8 d
D-(+)-Limonene	5989-27-5	EC50	188 μ g/l	aquatic invertebrates	21 d
β -Pinene	127-91-3	EC50	326 mg/l	microorganisms	3 h
γ -Terpinene	99-85-4	EC50	>1,000 mg/l	microorganisms	3 h
Geranial	141-27-5	EC50	160 mg/l	microorganisms	30 min
Neral	106-26-3	EC50	160 mg/l	microorganisms	30 min
Terpinolene	586-62-9	EC50	69 mg/l	microorganisms	3 h

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Biodegradation

Data are not available.

12.2 Process of degradability

Degradability of components of the mixture						
Name of substance	CAS No	Process	Degradation rate	Time	Method	Source
Acetic acid linalyl ester	115-95-7	oxygen depletion	≥0 – ≤10 %	1 d		ECHA
Linalool	78-70-6	oxygen depletion	40.9 %	5 d		ECHA
D-(+)-Limonene	5989-27-5	carbon dioxide generation	58.8 %	14 d		ECHA
D-(+)-Limonene	5989-27-5	oxygen depletion	80 %	28 d		ECHA
β-Pinene	127-91-3	oxygen depletion	76 %	28 d		ECHA
γ-Terpinene	99-85-4	oxygen depletion	27 %	28 d		ECHA
Geranial	141-27-5	oxygen depletion	>90 %	28 d		ECHA
DL-α-Pinene	80-56-8	oxygen depletion	68 %	28 d		ECHA
Myrcene	123-35-3	oxygen depletion	76 %	28 d		ECHA
Neral	106-26-3	oxygen depletion	>90 %	28 d		ECHA
Terpinolene	586-62-9	oxygen depletion	81 %	28 d		ECHA

12.3 Bioaccumulative potential

Data are not available.

Bioaccumulative potential of components of the mixture				
Name of substance	CAS No	BCF	Log KOW	BOD5/COD
Acetic acid linalyl ester	115-95-7	174	3.9 (25 °C)	
Linalool	78-70-6		2.9 (pH value: 7, 20 °C)	
D-(+)-Limonene	5989-27-5		4.38 (pH value: 7.2, 37 °C)	
γ-Terpinene	99-85-4		5.4 (25 °C)	
DL-α-Pinene	80-56-8		4.83	
Myrcene	123-35-3		4.82 (pH value: ~6.5, 30 °C)	
Neral	106-26-3	89.72		
Terpinolene	586-62-9		4.47	

12.4 Mobility in soil

Data are not available.

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12.5 Results of PBT and vPvB assessment

Data are not available.

12.6 Endocrine disrupting properties

None of the ingredients are listed.

12.7 Other adverse effects

Data are not available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods



This material and its container must be disposed of as hazardous waste. Dispose of contents/container in accordance with local/regional/national/international regulations.

Sewage disposal-relevant information

Do not empty into drains.

Waste treatment of containers/packagings

Only packagings which are approved (e.g. acc. to the Dangerous Goods Regulations) may be used.

Relevant provisions relating to waste(Basel Convention)

Properties of waste which render it hazardous

H3 Flammable liquids
H11 Toxic (Delayed or chronic)

13.3 Remarks

Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities. Please consider the relevant national or regional provisions.

SECTION 14: Transport information

14.1 UN number

UN RTDG	UN 1993
IMDG-Code	UN 1993
ICAO-TI	UN 1993

14.2 UN proper shipping name

UN RTDG	FLAMMABLE LIQUID, N.O.S.
IMDG-Code	FLAMMABLE LIQUID, N.O.S.
ICAO-TI	Flammable liquid, n.o.s.
Technical name (hazardous ingredients)	D-(+)-Limonene, Terpinolene

14.3 Transport hazard class(es)

UN RTDG	3
IMDG-Code	3
ICAO-TI	3

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14.4 Packing group

UN RTDG	III
IMDG-Code	III
ICAO-TI	III

14.5 Environmental hazards

	hazardous to the aquatic environment
Environmentally hazardous substance (aquatic environment):	D-(+)-Limonene

14.6 Special precautions for user



There is no additional information.

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



The cargo is not intended to be carried in bulk.

14.8 Information for each of the UN Model Regulations

Transport information National regulations Additional information (UN RTDG)

UN number	1993
Class	3
Environmental hazards	Yes Hazardous to the aquatic environment
Packing group	III
Danger label(s)	3 Fish and tree
 	
Special provisions (SP)	223, 274 UN RTDG
Excepted quantities (EQ)	E1 UN RTDG
Limited quantities (LQ)	5 L UN RTDG

International Maritime Dangerous Goods Code (IMDG) - Additional information

Proper shipping name	FLAMMABLE LIQUID, N.O.S.
Particulars in the shipper's declaration	UN1993, FLAMMABLE LIQUID, N.O.S., (contains: D-(+)-Limonene, Terpinolene), 3, III, 57°C c.c., MARINE POLLUTANT
Marine pollutant	YES (hazardous to the aquatic environment), (D-(+)-Limonene)
Danger label(s)	3, "Fish and tree"
 	
Special provisions (SP)	223, 274, 955
Excepted quantities (EQ)	E1
Limited quantities (LQ)	5 L


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EmS	F-E, <u>S-E</u>
Stowage category	A
International Civil Aviation Organization (ICAO-IATA/DGR) - Additional information	
Proper shipping name	Flammable liquid, n.o.s.
Particulars in the shipper's declaration	UN1993, Flammable liquid, n.o.s., (contains: D-(+)-Limonene, Terpinolene), 3, III
Environmental hazards	yes (hazardous to the aquatic environment)
Danger label(s)	3
	
Special provisions (SP)	A3
Excepted quantities (EQ)	E1
Limited quantities (LQ)	10 L

SECTION 15: Regulatory information

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

There is no additional information.

National regulations(Australia)

Australian Inventory of Chemical Substances(AICS)

All ingredients are listed or exempt from listing.

Other information

Directive 94/33/EC on the protection of young people at work. Observe employment restrictions under the Maternity Protection Directive (92/85/EEC) for expectant or nursing mothers.

National inventories

Country	Inventory	Status
AU	AICS	all ingredients are listed
CA	DSL	all ingredients are listed
CN	IECSC	all ingredients are listed
EU	ECSI	all ingredients are listed
EU	REACH Reg.	all ingredients are listed
JP	CSCL-ENCS	all ingredients are listed
JP	ISHA-ENCS	not all ingredients are listed
KR	KECI	not all ingredients are listed
MX	INSQ	not all ingredients are listed
NZ	NZIoC	all ingredients are listed
PH	PICCS	all ingredients are listed
TR	CICR	not all ingredients are listed

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Country	Inventory	Status
TW	TCSI	not all ingredients are listed
US	TSCA	all ingredients are listed

Legend

AICS	Australian Inventory of Chemical Substances
CICR	Chemical Inventory and Control Regulation
CSCL-ENCS	List of Existing and New Chemical Substances (CSCL-ENCS)
DSL	Domestic Substances List (DSL)
ECSI	EC Substance Inventory (EINECS, ELINCS, NLP)
IECSC	Inventory of Existing Chemical Substances Produced or Imported in China
INSQ	National Inventory of Chemical Substances
ISHA-ENCS	Inventory of Existing and New Chemical Substances (ISHA-ENCS)
KECI	Korea Existing Chemicals Inventory
NZIoC	New Zealand Inventory of Chemicals
PICCS	Philippine Inventory of Chemicals and Chemical Substances (PICCS)
REACH Reg.	REACH registered substances
TCSI	Taiwan Chemical Substance Inventory
TSCA	Toxic Substance Control Act

15.2 Chemical Safety Assessment

Chemical safety assessments for substances in this mixture were not carried out.

SECTION 16: Other information

Indication of changes (revised safety data sheet)

Alignment to regulation: Globally Harmonized System of Classification and Labelling of Chemicals ("Purple book").

Restructuring: section 9, section 14

Section	Former entry (text/value)	Actual entry (text/value)	Safety-relevant
2.2	Hazardous ingredients for labelling: Acetic acid linalyl ester, Linalool, D-(+)-Limonene, DL- α -Pinene, β -Pinene, Geranial, Neral, Terpinolene	Hazardous ingredients for labelling: Acetic acid linalyl ester, D-(+)-Limonene, Linalool, DL- α -Pinene, β -Pinene, Geranial, Myrcene, Neral, Terpinolene	yes

Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
Acute Tox.	Acute toxicity
Asp. Tox.	Aspiration hazard
ATE	Acute Toxicity Estimate
BCF	Bioconcentration factor
BOD	Biochemical Oxygen Demand
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
COD	Chemical oxygen demand
DGR	Dangerous Goods Regulations (see IATA/DGR)
DNEL	Derived No-Effect Level
EC50	Effective Concentration 50 %. The EC50 corresponds to the concentration of a tested substance causing 50 % changes in response (e.g. on growth) during a specified time interval
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances

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Abbr.	Descriptions of used abbreviations
EmS	Emergency Schedule
ErC50	≡ EC50: in this method, that concentration of test substance which results in a 50 % reduction in either growth (EbC50) or growth rate (ErC50) relative to the control
Eye Dam.	Seriously damaging to the eye
Eye Irrit.	Irritant to the eye
Flam. Liq.	Flammable liquid
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)
ICAO	International Civil Aviation Organization
ICAO-TI	Technical instructions for the safe transport of dangerous goods by air
IMDG	International Maritime Dangerous Goods Code
IMDG-Code	International Maritime Dangerous Goods Code
LC50	Lethal Concentration 50%: the LC50 corresponds to the concentration of a tested substance causing 50 % lethality during a specified time interval
LD50	Lethal Dose 50 %: the LD50 corresponds to the dose of a tested substance causing 50 % lethality during a specified time interval
log KOW	n-Octanol/water
MARPOL	International Convention for the Prevention of Pollution from Ships (abbr. of "Marine Pollutant")
NLP	No-Longer Polymer
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No-Effect Concentration
Repr.	Reproductive toxicity
Skin Corr.	Corrosive to skin
Skin Irrit.	Irritant to skin
Skin Sens.	Skin sensitisation
UN RTDG	UN Recommendations on the Transport of Dangerous Good
vPvB	Very Persistent and very Bioaccumulative

Key literature references and sources for data

Safe Work Australia's Code of Practice for Labelling of Workplace Hazardous Chemicals (under WHS Regulations).

UN Recommendations on the Transport of Dangerous Good. International Maritime Dangerous Goods Code (IMDG). Dangerous Goods Regulations (DGR) for the air transport (IATA).

Classification procedure

Physical and chemical properties. The classification is based on tested mixture.
Health hazards. Environmental hazards. The method for classification of the mixture is based on ingredients of the mixture (additivity formula).

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List of relevant phrases (code and full text as stated in section 2 and 3)

Code	Text
H226	Flammable liquid and vapour.
H227	Combustible liquid.
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.
H361fd	Suspected of damaging fertility. Suspected of damaging the unborn child.

Disclaimer

This information is based upon the present state of our knowledge. This SDS has been compiled and is solely intended for this product.