

SAFETY DATA SHEET

ACCORDING TO REGULATION (EC) 1907/2006

Product name: Lemon Winter Essential Oil (Italy)

Creation date: 23.02.2026, Revision: 23.02.2026, Version: 1.0

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

1.1 Product identifier

Product name

Lemon Winter Essential Oil (Italy)

Product code

[AC00015]

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

Relevant identified uses

Fragrances / Cosmetic / Flavours

Uses advised against

No information.

1.3 Details of the supplier of the safety data sheet

Supplier/Distributor

Farmadria DOO
Heroja Pinkija 44
26300 Vršac, Serbia
+381695565029
info@avenalab.com

1.4 Emergency Telephone Number

Emergency

112

Supplier/Distributor

+381695565029

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

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

Flam. Liq. 3; H226 Flammable liquid and vapour.

Asp. Tox. 1; H304 May be fatal if swallowed and enters airways.



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Skin Irrit. 2; H315 Causes skin irritation.
Skin Sens. 1; H317 May cause an allergic skin reaction.
Eye Irrit. 2; H319 Causes serious eye irritation.
Repr. 2; H361 Suspected of damaging fertility or the unborn child.
Aquatic Acute 1; H400 Very toxic to aquatic life.
Aquatic Chronic 1; H410 Very toxic to aquatic life with long lasting effects.

2.2 Label elements

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



Signal word: DANGER

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.
H361 Suspected of damaging fertility or the unborn child.
H410 Very toxic to aquatic life with long lasting effects.

Supplemental hazard information (EU):

Not applicable.

Precautionary statements:

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.
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P403 + P235 Store in a well-ventilated place. Keep cool.
P501 Dispose of contents/container in accordance with national regulation.

Contains:

limonene
pin-2(10)-ene
p-mentha-1,4-diene
citral
pin-2(3)-ene
7-methyl-3-methylene-1,6-octadiene
citronellal
alpha-terpinene
caryophyllene

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p-mentha-1,4(8)-diene
 linalool
 Geranyl acetate

2.3 Other hazards

PBT/vPvB

No information.

Endocrine disrupting properties

The product does not contain substances with the potential for endocrine disorders.

Additional information

No information.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

For mixtures see 3.2.

3.2 Mixtures

Name	CAS EC Index REACH	%	Classification according to Regulation (EC) No 1272/2008 (CLP)	Specific Concentration Limits	Notes for substances
limonene	5989-27-5 205-341-0 601-029-00-7	> 50 %	Flam. Liq. 3; H226 Asp. Tox. 1; H304 Skin Irrit. 2; H315 Skin Sens. 1B; H317 Aquatic Acute 1; H400; M = 1 Aquatic Chronic 3; H412	/	/



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Name	CAS EC Index REACH	%	Classification according to Regulation (EC) No 1272/2008 (CLP)	Specific Concentration Limits	Notes for substances
pin-2(10)-ene	127-91-3 204-872-5 - 01- 2119519230- 54	[10-20]	Flam. Liq. 3; H226 Asp. Tox. 1; H304 Skin Irrit. 2; H315 Skin Sens. 1B; H317 Aquatic Acute 1; H400; M = 1 Aquatic Chronic 1; H410; M = 1	/	/
p-mentha-1,4- diene	99-85-4 202-794-6 - 01- 2120780478- 40	[10-20]	Flam. Liq. 3; H226 Asp. Tox. 1; H304 Repr. 2; H361 Aquatic Chronic 2; H411	/	/
citral	5392-40-5 226-394-6 605-019-00-3	[1-5]	Skin Irrit. 2; H315 Skin Sens. 1A; H317 Eye Irrit. 2; H319	/	/



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Name	CAS EC Index REACH	%	Classification according to Regulation (EC) No 1272/2008 (CLP)	Specific Concentration Limits	Notes for substances
pin-2(3)-ene	80-56-8 201-291-9 - 01- 2119519223- 49	[1-5]	Flam. Liq. 3; H226 Acute Tox. 4; H302 Asp. Tox. 1; H304 Skin Irrit. 2; H315 Skin Sens. 1B; H317 Aquatic Acute 1; H400; M = 1 Aquatic Chronic 1; H410; M = 1	/	/
7-methyl-3- methylene-1,6- octadiene	123-35-3 204-622-5 -	[1-5]	Flam. Liq. 3; H226 Asp. Tox. 1; H304 Skin Irrit. 2; H315 Eye Irrit. 2; H319 Aquatic Acute 1; H400; M = 1 Aquatic Chronic 2; H411	/	/
citronellal	106-23-0 203-376-6 -	[0-1]	Skin Irrit. 2; H315 Skin Sens. 1B; H317 Eye Irrit. 2; H319	/	/



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Name	CAS EC Index REACH	%	Classification according to Regulation (EC) No 1272/2008 (CLP)	Specific Concentration Limits	Notes for substances
alpha- terpinene	99-86-5 202-795-1 -	[0-1]	Flam. Liq. 3; H226 Acute Tox. 4; H302 Asp. Tox. 1; H304 Skin Sens. 1A; H317 Eye Irrit. 2; H319 Aquatic Chronic 2; H411	/	/
caryophyllene	87-44-5 201-746-1 - 01- 2120745237- 53	[0-1]	Asp. Tox. 1; H304 Skin Sens. 1B; H317	/	/
geraniol	106-24-1 203-377-1 - 01- 2119552430- 49	[0-1]	Skin Irrit. 2; H315 Skin Sens. 1A; H317 Eye Dam. 1; H318	/	/
p-mentha- 1,4(8)-diene	586-62-9 209-578-0 -	[0-1]	Asp. Tox. 1; H304 Skin Sens. 1B; H317 Aquatic Acute 1; H400; M = 1 Aquatic Chronic 1; H410; M = 1	/	/



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Name	CAS EC Index REACH	%	Classification according to Regulation (EC) No 1272/2008 (CLP)	Specific Concentration Limits	Notes for substances
linalool	78-70-6 201-134-4 603-235-00-2 01- 2119474016- 42	[0-1]	Skin Irrit. 2; H315 Skin Sens. 1B; H317 Eye Irrit. 2; H319	/	/
Geranyl acetate	105-87-3 203-341-5 - 01- 2119973480- 35	[0-1]	Skin Irrit. 2; H315 Skin Sens. 1B; H317 Aquatic Chronic 3; H412	oral: ATE = 6330 mg/kg bw	/

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

General notes

Never give anything by mouth to an unconscious person. Place patient in recovery position and ensure airway patency. When in doubt or if feeling unwell seek medical assistance. Show the safety data sheet and label to the physician. No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. When it is suspected, that there may still be harmful vapours/fumes present in the air, respiratory protection (mask; self contained breathing apparatus) must be used. Wash contaminated clothing with water before removing or use gloves.

Following inhalation

Remove patient to fresh air - move out of dangerous area. In case of unconsciousness bring patient into stable side position and seek medical attention. If breathing is irregular or respiratory arrest occurs, provide artificial respiration. Keep at rest in a position comfortable for breathing. Seek medical help immediately.

Following skin contact

Take off all contaminated clothing. Areas of the body that have come into contact with the product must be rinsed with water. Consult a physician.

Following eye contact

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Following ingestion

Do not induce vomiting! Aspiration hazard if swallowed. Can enter lungs and cause damage. If vomiting occurs, the patient should hold the head lower than the hips, because it reduces the possibility of aspiration. Rinse mouth thoroughly with water. Never give anything by mouth to an unconscious person. Immediately consult a doctor. Show the physician the safety data sheet or label.

4.2 Most important symptoms and effects, both acute and delayed

Following inhalation

Excessive exposure to spray mist, fog, or vapours may cause respiratory irritation.

Following skin contact

Itching, redness, pain. May cause sensitisation by skin contact (itching, redness, rashes).

Following eye contact

Contact with eyes can cause irritation (redness, tearing, pain).

Following ingestion

May cause nausea/vomiting and diarrhea. May cause abdominal discomfort. Irritates mucous membranes in the mouth, throat, esophagus and in gastrointestinal area. Aspiration into the lungs causes coughing, shortness of breath and may lead to chemical pneumonia.

4.3 Indication of any immediate medical attention and special treatment needed

Treat symptomatically. After the product has been ingested vomiting can cause aspiration into the lungs. Because of the risk of aspiration, induction of vomiting and gastric lavage should be avoided.

SECTION 5: FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Carbon dioxide. Dry chemical powder. Water spray. Alcohol resistant foam.

Unsuitable extinguishing media

Full water jet.

5.2 Special hazards arising from the substance or mixture

Hazardous combustion products

In case of a fire toxic gases can be generated; do not inhale gases/smoke.

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5.3 Advice for firefighters

Protective actions

In case of fire or heating do not breathe fumes/vapours. No action shall be taken involving any personal risk or without suitable training. Prolonged heating can cause an explosion. Vapours can form explosive mixtures with air. Cool containers at risk with water spray. If possible remove containers from endangered area.

Special protective equipment for fire-fighters

Firefighters should wear appropriate protective clothing for firefighters (including helmets, protective boots and gloves) (BS EN 469) and self-contained breathing apparatus (SCBA) with a full face-piece (BS EN 137).

Additional information

Contaminated firefighting water and fire residues must be disposed of in accordance with the local regulations.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Protective equipment

No information.

Precautionary measures

Ensure adequate ventilation. Keep away from sources of ignition and/or heat; No smoking!

Emergency procedures

No action shall be taken involving any personal risk or without suitable training. Prevent access to unprotected personnel. Evacuate the danger zone. Do not breathe vapour or mist. Avoid contact with skin, eyes and clothing.

For emergency responders

Use personal protective equipment.

6.2 Environmental precautions

Do not allow product to reach water/drains/sewage systems or permeable soil. In case of release into the environment, inform the relevant authorities.

6.3 Methods and material for containment and cleaning up

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Stem the spill if this does not pose risks.

For cleaning up

Absorb product (with inert material), collect it in special container and dispose it to a licensed hazardous-waste disposal contractor. Use only explosion-proof instruments and equipment. Use spark-proof tools. Prevent release into the sewer, water, basements or confined areas. Ventilate the premises. Clean contaminated area with plenty of water.

Other information

No information.

6.4 Reference to other sections

See also sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Protective measures

Measures to prevent fire

Ensure adequate ventilation. Keep away from sources of ignition - no smoking. Use spark-proof tools. Take precautionary measures against static discharges. Vapours are heavier than air and spread along the floor. They form explosive mixtures with air.

Measures to prevent aerosol and dust generation

Use general or local exhaust ventilation to prevent inhaling vapours and aerosols.

Measures to protect the environment

Do not discharge into drains, surface water and soil. After use immediately close container tightly.

Other measures

No information.

Advice on general occupational hygiene

Use good personal hygiene practices – wash hands at breaks and when done working with material. Do not eat, drink or smoke while working. Do not breathe vapours/mist. Avoid contact with skin, eyes and clothes. Remove contaminated clothes and wash them before reuse. Wear suitable protective equipment; see Section 8.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures and storage conditions



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Keep in a cool, dry and well ventilated place. Protect from open fire, heat and direct sunlight. Keep away from food, drink and animal feeding stuffs. Keep away from oxidising substances. Keep away from sources of ignition - no smoking.

Packaging materials

Store only in original container.

Requirements for storage rooms and vessels

Close opened containers after use. Put the containers upright to prevent from leaking. Do not store in unlabelled containers.

Storage temperature

No information.

Storage class

No information.

Further information on storage conditions

No information.

7.3 Specific end use(s)

Recommendations

No information.

Industrial sector specific solutions

No information.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Occupational Exposure limit values

No information.

Information on monitoring procedures

BS EN 14042:2003 Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents. BS EN 689:2018 Workplace exposure. Measurement of exposure by inhalation to chemical agents. Strategy for testing compliance with occupational exposure limit values. BS EN 482:2021 Workplace exposure. Procedures for the determination of the concentration of chemical agents. Basic performance requirements.

DNEL/DMEL values

For product

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No information.

For components

No information.

PNEC values

For product

No information.

For components

No information.

8.2 Exposure controls

Appropriate engineering control

Substance/mixture related measures to prevent exposure during identified uses

Use good personal hygiene practices – wash hands at breaks and when done working with material.
Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes and clothes. Do not eat, drink or smoke while working. Do not breathe vapours/aerosols.

Structural measures to prevent exposure

No information.

Organisational measures to prevent exposure

Remove all contaminated clothes immediately and wash them before reuse.

Technical measures to prevent exposure

Provide good ventilation and local exhaust in areas with increased concentration. Keep away from food, drink and animal feeding stuffs.

Personal protective equipment

Eye and face protection

Safety glasses with side protection (BS EN ISO 16321-1:2022/A1:2025).

Hand protection

Protective gloves (EN ISO 374). Observe the manufacturer's instructions regarding the use, storage, maintenance and replacement of gloves. In case of damage or at the first signs of wear and tear, change the gloves immediately. The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. The penetration time is determined by the protective glove manufacturer and must be observed.

Appropriate materials

No information.

Skin protection

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Protective antistatic clothing EN 1149 (1:2006, 2:1998 and 3:2004, 5:2008), protective antistatic shoes (EN 20345:2022). At high risk of skin exposure chemical suits (BS EN 13034:2005+A1:2009) and boots may be required (BS EN ISO 20345:2022+A1:2024).

Respiratory protection

In case of insufficient ventilation wear suitable respiratory protection. Wear suitable protective breathing mask (BS EN 136) with filter A2-P2 (BS EN 14387). For dust/gas/ vapor concentrations above the applicable filter limit, in case of oxygen concentrations below 17% or in vague conditions, autonomous self-contained breathing apparatus should be used, according to standard BS EN 137, BS EN 138.

Thermal hazards

No information.

Environmental exposure controls

Substance/mixture related measures to prevent exposure

No information.

Instruction measures to prevent exposure

No information.

Organisational measures to prevent exposure

No information.

Technical measures to prevent exposure

Do not allow product to reach drains, sewage systems or ground water.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Important health, safety and environmental information

Physical state	liquid
Shape	No information.
Colour	yellow to greenish
Odour	Typical lemon oil; green note
Odour threshold	No information.
Melting/freezing point or softening point	No information.



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Boiling point or initial boiling point and boiling range	160 °C
Flammability	No information.
Lower and upper explosion limit	No information.
Flash point	49 °C (close cup)
Auto-ignition temperature	No information.
Decomposition temperature	No information.
pH	No information.
Viscosity	No information.
Solubility (Water)	soluble Solubility ethanol : Yes
Partition coefficient n-octanol/water (log value)	No information.
Vapour pressure	2.188 hPa at 25 °C
Density	0.845 at 20 °C
Relative vapour/gas density	No information.
Particle characteristics	No information.

9.2 Other information

Information with regard to physical hazard classes

No information.

Other safety characteristics

No information.

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

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Avoid powerful oxidising agents

10.2 Chemical stability

Product is stable under normal conditions of use, recommended handling and storage conditions.

10.3 Possibility of hazardous reactions

Vapours and air can form flammable or explosive mixtures.

10.4 Conditions to avoid

Avoid any potential source of heat.

10.5 Incompatible materials

Oxidants.

10.6 Hazardous decomposition products

Under normal use conditions no hazardous decomposition products are expected. In case of fire/explosion vapours/gases that pose a health hazard are released.

SECTION 11: TOXICOLOGICAL INFORMATION

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

(a) Acute toxicity

For components

Name	Exposure route	Type	Species	Time	Value	Method	Remark
pin-2(10)-ene	oral	LD ₅₀	rat	/	> 5000 mg/kg	/	/
pin-2(10)-ene	dermal	LD ₅₀	rabbit	/	> 5000 mg/kg	/	/



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Name	Exposure route	Type	Species	Time	Value	Method	Remark
p-mentha-1,4-diene	oral	LD ₅₀	/	/	3850 mg/kg	/	/
citral	Intraperitoneal	LD ₅₀	rat	/	460 mg/kg	/	/
citral	oral	LD ₅₀	mouse	/	6000 mg/kg	/	/
citral	oral	LD ₅₀	rat	/	4960 mg/kg	/	/
pin-2(3)-ene	oral	LD ₅₀	rat	/	3700 mg/kg	/	/
7-methyl-3-methylene-1,6-octadiene	oral	LD ₅₀	rat	/	> 11390 mg/kg bw	/	/
7-methyl-3-methylene-1,6-octadiene	oral	LD ₅₀	mouse	/	> 3380 mg/kg bw	/	/
7-methyl-3-methylene-1,6-octadiene	dermal	LD ₅₀	rabbit	/	> 5000 mg/kg bw	OECD 402	/
citronellal	oral	LD ₅₀	rat	/	2420 mg/kg	/	/
citronellal	dermal	LD ₅₀	rat	/	> 2000 mg/kg bw	/	/
citronellal	dermal	LD ₅₀	rabbit	/	2500 - 5000 mg/kg bw	/	/

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Name	Exposure route	Type	Species	Time	Value	Method	Remark
alpha-terpinene	oral	ATE	/	/	1680 mg/kg bw	/	/
caryophyllene	oral	LD ₅₀	rat	/	> 5000 mg/kg	/	/
caryophyllene	dermal	LD ₅₀	rabbit	/	> 5000 mg/kg	/	/
linalool	oral	LD ₅₀	rat	/	2790 mg/kg	OECD 401	/
linalool	dermal	LD ₅₀	rabbit	/	5610 mg/kg	OECD 402	/
Geranyl acetate	oral	LD ₅₀	rat	/	6330 mg/kg	/	/
Geranyl acetate	dermal	LD ₅₀	rabbit	/	> 5460 mg/kg	/	/

Additional information

The product is not classified as acutely toxic.

(b) Skin corrosion/irritation

For components

Name	Species	Time	Result	Method	Remark
limonene	/	/	Irritating.	/	/
pin-2(10)-ene	/	/	Irritating.	/	/
citral	/	/	Irritating.	/	/
citral	/	/	May cause sensitisation by skin contact.	/	/

Additional information

Causes skin irritation.

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(c) Serious eye damage/irritation

For components

Name	Exposure route	Species	Time	Result	Method	Remark
citral	/	rabbit	/	Irritating.	OECD 405	/

(d) Respiratory or skin sensitisation

For components

Name	Exposure route	Species	Time	Result	Method	Remark
citral	dermal	/	/	Sensitizing.	/	/

Additional information

May cause an allergic skin reaction.

(e) (Germ cell) mutagenicity

For components

Name	Type	Species	Time	Result	Method	Remark
citral	Genotoxicity	/	/	Negative.	/	in vitro
citral	in-vivo mutagenicity	/	/	Negative.	OECD 471	/
citral	Genotoxicity	mouse	/	Studies in vivo have shown it is not genotoxic.	OECD 474	/

(f) Carcinogenicity

For components

Name	Exposure route	Type	Species	Time	Value	Result	Method	Remark
citral	oral	NOEL	rat	/	> 100 mg/kg	/	OECD 453	/



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Name	Exposure route	Type	Species	Time	Value	Result	Method	Remark
citronella l	oral	NOAEL	mouse (male)	2 years	60 mg/kg bw	/	OECD 453 Combined Chronic Toxicity/ Carcinogenicity Studies	chronic

(g) Reproductive toxicity

For components

Name	Reproductive toxicity type	Type	Species	Time	Value	Result	Method	Remark
citral	Developmental toxicity	NOAEL	rat	/	200 mg/kg bw/day	/	OECD 421	oral
citral	Developmental toxicity	NOAEL	rat	/	423 mg/m ³	/	/	inhalation
citral	Reproductive toxicity	NOAEL	rat	/	> 1000 mg/kg bw/day	/	OECD 421	/

Summary of evaluation of the CMR properties

The product is not classified as carcinogenic, mutagenic or toxic for reproduction.

(h) STOT-single exposure

For components

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Name	Exposure route	Type	Species	Time	Exposure	Organ	Value	Result	Method	Remark
citral	-	-	/	/	/	/	/	Symptoms: difficulty breathing, drowsiness, cough, headache, gastrointestinal problems, mucosal irritation, nausea.	/	/

Additional information

STOT SE (single exposure): Not classified.

(i) STOT-repeated exposure

For components

Name	Exposure route	Type	Species	Time	Exposure	Organ	Value	Result	Method	Remark
7-methyl-3-methylene-1,6-octadiene	oral	LOAEL	rat	90 days	/	/	250 mg/kg bw	/	OECD 408	/



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Name	Exposure route	Type	Species	Time	Exposure	Organ	Value	Result	Method	Remark
7-methyl-3-methylene-1,6-octadiene	oral	NOAEL	animal /female	90 days	sub-chronic	/	500 mg/kg bw	/	OECD 408	/
7-methyl-3-methylene-1,6-octadiene	oral	NOAEL	animal /male	90 days	sub-chronic	/	250 mg/kg bw	/	OECD 408	/
citronellal	inhalation (gases)	LOAEC	rat (female)	90 days	/	/	68 ppm	/	/	/
citronellal	oral	NOAEL	rat	90 days	/	/	100 mg/kg bw	/	OECD 453	/
citronellal	inhalation (gases)	NOAEC	rat (female)	90 days	/	/	34 ppm	/	/	/
citronellal	oral	NOAEL	mouse (male)	90 days	sub-chronic	/	60 mg/kg bw	/	OECD 453	/

Additional information

STOT RE (repeated exposure): Not classified.

(j) Aspiration hazard

No information.

Additional information

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Symptoms related to the physical, chemical and toxicological characteristics

No information.

Interactive effects

No information.

11.2 Information on other hazards

Endocrine disrupting properties

The product does not contain substances with the potential for endocrine disorders.

Other information

No information.

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

Acute (short-term) toxicity

For components

Name	Type	Value	Exposure time	Species	Organism	Method	Remark
pin-2(10)-ene	/	0.826 mg/L	48 h	algae/aquatic plants	<i>Pseudokirchneriella subcapitata</i>	OECD 201	/
pin-2(10)-ene	/	0.502 mg/L	96 h	fish	<i>Pimephales promelas</i>	OECD 203	/
pin-2(10)-ene	/	326 mg/L	3 h	microorganisms	Activated sludge	OECD 209	/
pin-2(10)-ene	/	1.248 mg/L	48 h	crustacea	<i>Daphnia magna</i>	OECD 202	/
citral	LC ₅₀	19 mg/L	96 h	fish	/	/	/

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Name	Type	Value	Exposure time	Species	Organism	Method	Remark
citral	EC ₅₀	7 mg/L	48 h	crustacea	/	/	/
citral	EC ₅₀	16 mg/L	72 h	algae	/	/	/
citronellal	LC ₅₀	ca. 22 mg/L	/	fish	<i>Leuciscus idus</i>	/	/
citronellal	EC ₅₀	8.7 mg/L	/	crustacea	<i>Daphnia magna</i>	/	/
citronellal	EC ₅₀	13.33 mg/L	72 h	algae	<i>Desmodesmus subspicatus</i>	/	/
citronellal	EC ₅₀	6.74 mg/L	72 h	algae	<i>Desmodesmus subspicatus</i>	/	/
citronellal	EC ₅₀	13.33 mg/L	96 h	algae	/	/	ECHA
geraniol	LC ₅₀	22 mg/L	96 h	fish	<i>Danio rerio</i>	/	static system
geraniol	ErC ₅₀	13.1 mg/L	72 h	algae	<i>Scenedesmus capricornutum</i>	/	static test
geraniol	NOEC	1 mg/L	72 h	fish	<i>Desmodesmus subspicatus</i>	/	/
p-mentha-1,4(8)-diene	LC ₅₀	0.805 mg/L	96	fish	<i>Danio rerio</i>	/	/
p-mentha-1,4(8)-diene	EC ₅₀	0.634 mg/L	48 h	crustacea	<i>Daphnia magna</i>	/	/

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Name	Type	Value	Exposure time	Species	Organism	Method	Remark
p-mentha-1,4(8)-diene	EC ₅₀	69 mg/L	3 h	other aquatic organisms	/	/	/
linalool	/	156.7 mg/L	96 h	algae	<i>Desmodesmus subspicatus</i>	/	/
linalool	/	27.8 mg/L	96 h	fish	<i>Oncorhynchus mykiss</i>	OECD 203	/
linalool	/	101 mg/L	3 h	microorganisms	Activated sludge	OECD 209 Activated Sludge, Respiration Inhibition Test	/
linalool	/	59 mg/L	48 h	crustacea	<i>Daphnia magna</i>	OECD 202	/
Geranyl acetate	EC ₅₀	14.1 mg/L	48 h	crustacea	<i>Daphnia magna</i>	/	/
Geranyl acetate	ErC ₅₀	3.72 mg/L	72 h	algae	<i>Desmodesmus subspicatus</i>	OECD 201	/
Geranyl acetate	NOEC	0.585 mg/L	72 h	algae	<i>Desmodesmus subspicatus</i>	/	/

Chronic (long-term) toxicity

For components



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Name	Type	Value	Exposure time	Species	Organism	Method	Remark
citral	NOEC	68 mg/L	/	/	/	OECD 209	0,02083 days
citral	NOEC	3 mg/L	3 days	algae	<i>Desmodesmus subspicatus</i>	DIN 38412 L 9	/
linalool	/	3.5 mg/L	4 days	fish	<i>Oncorhynchus mykiss</i>	OECD 203	/
linalool	/	25 mg/L	2 days	crustacea	<i>Daphnia magna</i>	OECD 202	/
linalool	/	> 100 mg/L	3 h	microorganisms	/	OECD 209	/

12.2 Persistence and degradability

Abiotic degradation, physical- and photo-chemical elimination

No information.

Biodegradation

For components

Name	Type	Rate	Time	Evaluation	Method	Remark
pin-2(10)-ene	biodegradation	76 %	28 days	readily biodegradable	OECD 301 D	Oxygen consumption
citral	aerobic	90 %	28 days	readily biodegradable	EU Method C.4-D	/
geraniol	biodegradability	90 %	28 days	readily biodegradable	/	/

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Name	Type	Rate	Time	Evaluation	Method	Remark
p-mentha-1,4(8)-diene	biodegradation	81 %	28 days	Readily biodegradable in water.	/	/
linalool	biodegradation	64.2 %	28 days	readily biodegradable	OECD 301 D	Oxygen consumption
Geranyl acetate	/	/	/	Rapidly degradable.	/	/

12.3 Bioaccumulative potential

Partition coefficient n-octanol/water (log value)

For components

Name	Value	Temperature °C	pH	Concentration	Method
pin-2(10)-ene	26610	/	/	/	OECD 107
citral	2.76	/	/	/	/
citronellal	3.48	/	/	/	/
geraniol	2.6	/	/	/	/
p-mentha-1,4(8)-diene	4.47	/	/	/	/
linalool	2.9	/	/	/	/
Geranyl acetate	4.04	/	/	/	OECD 117

Bioconcentration factor (BCF)

For components

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Name	Species	Organism	Value	Duration	Evaluation	Method	Remark
pin-2(10)-ene	BCF	/	1125	/	L/kg	/	/
citral	BCF	/	89.72	/	/	/	/

12.4 Mobility in soil

Known or predicted distribution to environmental compartments

For components

Name	Air	Water	Soil	Sediment	(Aquatic) Biota	Method	Remark
citronellal	/	/	652.1	/	/	/	/

Surface tension

No information.

Adsorption/Desorption

For components

Name	Type	Criterion	Value	Evaluation	Method	Remark
pin-2(10)-ene	Soil	log KOC	1020	/	/	/
citral	Soil	/	147.7	/	/	Koc
geraniol	Soil	/	70.79	/	/	Koc
p-mentha-1,4(8)-diene	/	log KOC	2.619 - 3.049	/	/	/

12.5 Results of PBT and vPvB assessment

No evaluation.

12.6 Endocrine disrupting properties



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The product does not contain substances with the potential for endocrine disorders.

12.7 Other adverse effects

No information.

12.8 Additional information

For product

Toxic to aquatic organisms: may cause long-term adverse effects in the aquatic environment. Do not allow to reach ground water, water courses or sewage system.

For components

pin-2(10)-ene

This substance is not considered to be persistent, bioaccumulative and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulative (vPvB).

citral

Low bioaccumulation potential.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product / Packaging disposal

Waste chemical

Do not allow product to reach drains/sewage systems. Disposal must be made according to official regulations: deliver it to authorised collector/remover/transformer of hazardous waste.

Waste codes / waste designations according to LoW

No information.

Packaging

Deliver completely emptied containers to approved waste disposal authorities. Uncleaned containers are classified as hazardous waste - they should be handled in the same manner as the contents. Uncleaned containers should not be perforated, cut or welded. Empty containers represent a fire hazard as they may contain flammable product residues and vapours.

Waste codes / waste designations according to LoW

No information.

Waste treatment-relevant information

No information.

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No information.

Other disposal recommendations

No information.

SECTION 14: TRANSPORT INFORMATION

14.1 UN number or ID number

ADR/RID	IMDG	IATA	ADN
UN 1197	UN 1197	UN 1197	UN 1197

14.2 UN proper shipping name

ADR/RID	IMDG	IATA	ADN
EXTRACTS, LIQUID	EXTRACTS, LIQUID	EXTRACTS, LIQUID	EXTRACTS, LIQUID

14.3 Transport hazard class(es)

ADR/RID	IMDG	IATA	ADN
3	3	3	3
 	 	 	 

14.4 Packing group

ADR/RID	IMDG	IATA	ADN
III	III	III	III

14.5 Environmental hazards

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ADR/RID	IMDG	IATA	ADN
YES	Marine pollutant	YES	YES

14.6 Special precautions for user

ADR/RID	IMDG	IATA	ADN
Limited quantities: 5 L Special provisions: 601 Packing Instructions: P001, IBC03, LP01, R001 Transport category: 3 Tunnel restriction code: (D/E) Classification code: F1	Limited quantities: 5 L EmS: F-E, S-D Flash point: 49 °C	Limited Quantity, Packing Instructions (Ltd Qty, Pkg Inst): Y344 Limited Quantity, Maximum Net Quantity/Package (Ltd Qty, Max Net Qty/Pkg): 10 L Packing Instructions (Pkg Inst): 355 Maximum Net Quantity/Package (Max Net Qty/Pkg): 60 L Cargo Aircraft Only, Packing Instructions (CAO, Pkg Inst): 366 Cargo Aircraft Only, Maximum Net Quantity/Package (CAO, Max Net Qty/Pkg): 220 L Excepted quantities: E1 ERG code: 3L	Limited quantities: 5 L

14.7 Maritime transport in bulk according to IMO instruments

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ADR/RID	IMDG	IATA	ADN
/	Goods may not be carried in bulk in bulk containers, containers or vehicles.	/	/

SECTION 15: REGULATORY INFORMATION

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

- Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (including last amendment Commission Regulation (EU) 2020/878)
- Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures
- EH40/2005 Workplace exposure limits (Fourth Edition 2020)

Information according 2004/42/EC about limitation of emissions of volatile organic compounds (VOC-guideline)

not applicable

Ingredients according to Regulation (EC) No 648/2004 on detergents

No information.

Special instructions

Observe the regulations on employment and protection against dangerous substances for young people, pregnant women and nursing mothers.

15.2 Chemical Safety Assessment

No Chemical Safety Assessment has been carried out for this substance/mixture by the supplier.

SECTION 16: OTHER INFORMATION

Indication of changes

No information.

Key literature references and sources for data

No information.

Abbreviations and acronyms



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ATE - Acute Toxicity Estimate
ADR - Agreement concerning the International Carriage of Dangerous Goods by Road
ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
CEN - European Committee for Standardisation
C&L - Classification and Labelling
CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
CAS# - Chemical Abstracts Service number
CMR - Carcinogen, Mutagen, or Reproductive Toxicant
CSA - Chemical Safety Assessment
CSR - Chemical Safety Report
DMEL - Derived Minimal Effect Level
DNEL - Derived No Effect Level
DPD - Dangerous Preparations Directive 1999/45/EC
DSD - Dangerous Substances Directive 67/548/EEC
DU - Downstream User
EC - European Community
ECHA - European Chemicals Agency
EC-Number - EINECS and ELINCS Number (see also EINECS and ELINCS)
EEA - European Economic Area (EU + Iceland, Liechtenstein and Norway)
EEC - European Economic Community
EINECS - European Inventory of Existing Commercial Substances
ELINCS - European List of notified Chemical Substances
EN - European Standard
EQS - Environmental Quality Standard
EU - European Union
Euphrac - European Phrase Catalogue
EWC - European Waste Catalogue (replaced by LoW – see below)
GES - Generic Exposure Scenario
GHS - Globally Harmonized System
IATA - International Air Transport Association
ICAO-TI - Technical Instructions for the Safe Transport of Dangerous Goods by Air
IMDG - International Maritime Dangerous Goods
IMSBC - International Maritime Solid Bulk Cargoes
IT - Information Technology
IUCLID - International Uniform Chemical Information Database
IUPAC - International Union for Pure Applied Chemistry
JRC - Joint Research Centre
Kow - octanol-water partition coefficient
LC50 - Lethal Concentration to 50 % of a test population
LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose)
LE - Legal Entity
LoW - List of Wastes (see <http://ec.europa.eu/environment/waste/framework/list.htm>)
LR - Lead Registrant
M/I - Manufacturer / Importer
MS - Member States
MSDS - Material Safety Data Sheet
OC - Operational Conditions
OECD - Organization for Economic Co-operation and Development
OEL - Occupational Exposure Limit



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OJ - Official Journal

OR - Only Representative

OSHA - European Agency for Safety and Health at work

PBT - Persistent, Bioaccumulative and Toxic substance

PEC - Predicted Effect Concentration

PNEC(s) - Predicted No Effect Concentration(s)

PPE - Personal Protection Equipment

(Q)SAR - Qualitative Structure Activity Relationship

REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals (Regulation (EC) No 1907/2006)

RID - Regulations concerning the International Carriage of Dangerous Goods by Rail

RIP - REACH Implementation Project

RMM - Risk Management Measure

SCBA - Self-Contained Breathing Apparatus

SDS - Safety data sheet

SIEF - Substance Information Exchange Forum

SME - Small and Medium sized Enterprises

STOT - Specific Target Organ Toxicity

(STOT) RE - Repeated Exposure

(STOT) SE - Single Exposure

SVHC - Substances of Very High Concern

UN - United Nations

vPvB - Very Persistent and Very Bioaccumulative

List of relevant H phrases

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.

H318 Causes serious eye damage.

H319 Causes serious eye irritation.

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.