

Safety data sheet

according to Regulation (EC) No 1907/2006, Article 31

Printing date 02.02.2026

version: 1

Revision: 02.02.2026

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

1.1 Product identifier:

Trade name: **(-)-Limonene**

Article number: 27079

CAS Number:

5989-54-8

EC number:

227-815-6

Index number:

601-029-00-7

Registration number 01-2119958629-18-XXXX

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

No further relevant information available.

Application of the substance / the preparation: Reference substance

1.3 Details of the supplier of the safety data sheet:

Manufacturer/Supplier:

PhytoLab GmbH & Co. KG

Dutendorfer Str. 5-7

D-91487 Vestenbergsgreuth

Germany

Phone: +49 9163 88-395

Fax: +49 9163 88-456

e-mail: ref-substances@phytolab.de

Further information obtainable from:

Material Safety Data Sheet: PLV_MSDS@phytolab.com

1.4 Emergency telephone number: Germany/9163/88-500

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture:

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



GHS02 flame

Flam. Liq. 3

H226 Flammable liquid and vapour.



GHS08 health hazard

Asp. Tox. 1

H304 May be fatal if swallowed and enters airways.



GHS09 environment

Aquatic Acute 1 H400 Very toxic to aquatic life.

Aquatic Chronic 1 H410 Very toxic to aquatic life with long lasting effects.

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GHS07

Skin Irrit. 2 H315 Causes skin irritation.

Skin Sens. 1 H317 May cause an allergic skin reaction.

2.2 Label elements:

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

The substance is classified and labelled according to the CLP regulation.

Hazard pictograms:



GHS02 GHS07 GHS08 GHS09

Signal word: Danger

Hazard statements:

H226 Flammable liquid and vapour.

H315 Causes skin irritation.

H317 May cause an allergic skin reaction.

H304 May be fatal if swallowed and enters airways.

H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements

P273 Avoid release to the environment.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.

P331 Do NOT induce vomiting.

P403+P235 Store in a well-ventilated place. Keep cool.

P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

2.3 Other hazards:

Restricted to professional users. The toxicological properties of this compound have not been fully evaluated.

Results of PBT and vPvB assessment:

PBT: Not applicable.

vPvB: Not applicable.

SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms: (S)-p-mentha-1,8-diene; l-limonene

CAS No. Description

5989-54-8 (-)-Limonene

Identification number(s)

EC number: 227-815-6

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Additional information: chemical product

SECTION 4: First aid measures

4.1 Description of first aid measures:

General information:

Immediately remove any clothing soiled by the product.

Induce vomiting only with medical help.

In case of irregular breathing or respiratory arrest provide artificial respiration.

After inhalation:

Supply fresh air or oxygen; call for doctor.

In case of unconsciousness place patient stably in side position for transportation.

After skin contact:

Immediately rinse with water.

If skin irritation continues, consult a doctor.

After eye contact:

Rinse opened eye for several minutes under running water. Then consult a doctor.

After swallowing:

Rinse out mouth and then drink plenty of water.

Do not induce vomiting; call for medical help immediately.

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

No further relevant information available.

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

No further relevant information available.

SECTION 5: Firefighting measures

5.1 Extinguishing media:

Suitable extinguishing agents:

CO₂, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

Use fire extinguishing methods suitable to surrounding conditions.

5.2 Special hazards arising from the substance or mixture:

No further relevant information available.

5.3 Advice for firefighters:

Protective equipment:

Wear fully protective suit.

Mount respiratory protective device.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures:

Use respiratory protective device against the effects of fumes/dust/aerosol.

Wear protective equipment. Keep unprotected persons away.

6.2 Environmental precautions: Do not allow to enter sewers/ surface or ground water.

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6.3 Methods and material for containment and cleaning up:
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to section 13.

6.4 Reference to other sections:
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling:
Handling corresponding to laboratory safety guidelines.
Keep receptacles tightly sealed.
Open and handle receptacle with care.
Ensure good ventilation/exhaustion at the workplace.
Keep away from heat and direct sunlight.
Prevent formation of aerosols.
Information about fire - and explosion protection:
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.

7.2 Conditions for safe storage, including any incompatibilities:
Storage:
Requirements to be met by storerooms and receptacles:
Store in a cool location.
Store only in the original receptacle.
Information about storage in one common storage facility: Store away from foodstuffs.
Further information about storage conditions:
Store in the dark.
Keep container tightly sealed.
Recommended storage temperature: 2-8 °C
Storage class: 3

7.3 Specific end use(s): No further relevant information available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters:
Ingredients with limit values that require monitoring at the workplace: Not required.
DNELs

Inhalative DNEL, worker, inhalative, systemic, short-term: 33.3 mg/m³

PNECs

PNEC: STP	0.2 mg/L
PNEC Water (fresh water)	0.0054 mg/L
PNEC Water (seawater)	0.00054 mg/L
PNEC Soil	0.262 mg/kg dw

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PNEC (seawater), sediment 0.132 mg/kg dw

PNEC (fresh water), sediment 1.322 mg/kg dw

PNEC Secondary poisoning: Food 133 mg/kg

Additional information: The lists valid during the making were used as basis.

8.2 Exposure controls:

Appropriate engineering controls: No further data; see section 7.

Individual protection measures, such as personal protective equipment:

General protective and hygienic measures:

The usual precautionary measures are to be adhered to when handling chemicals.

Store protective clothing separately.

Do not eat, drink, smoke or sniff while working.

Keep away from foodstuffs, beverages and feed.

Immediately remove all soiled and contaminated clothing.

Wash hands before breaks and at the end of work.

Avoid contact with the eyes and skin.

Respiratory protection:

Use suitable respiratory protective device only when aerosol or mist is formed.

Use suitable respiratory protective device in case of insufficient ventilation.

Hand protection:

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

Material of gloves:



Nitrile rubber, NBR

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.

Penetration time of glove material:

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

Eye/face protection:



Tightly sealed goggles

Body protection: Protective work clothing

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties:

General Information:

Physical state: Liquid

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Colour:	According to Certificate of Analysis
Odour:	No data available.
Odour threshold:	Not determined.
Molecular Weight	
Melting point/freezing point:	-74 °C (OECD 102)
Boiling point or initial boiling point and boiling range:	176-178 °C (ECHA [WoE])
Flammability:	Flammable.
Dust explosion class:	
Lower and upper explosion limit:	
Lower:	Not determined.
Upper:	Not determined.
Flash point:	51 °C (EU A.9 [closed cup])
(Minimum) Ignition temperature:	245 °C (EU A.15)
Decomposition temperature:	Not determined.
Powder volume resistivity:	
pH:	Not determined.
Dissociation constant:	
Viscosity:	
Kinematic viscosity:	Not determined.
Solubility in other solvents:	
Dynamic at 20 °C:	0.846 mPas (OECD 114)
Solubility:	
water:	No data available.
Partition coefficient n-octanol/water (log value) at 37 °C:	4.38 (OECD 117)
Vapour pressure:	Not determined.
Vapour pressure at 25 °C:	200 Pa (ECHA (read-across))
Density and/or relative density:	
Density at 20 °C:	0.84 g/cm ³ (ECHA [WoE])
Relative density:	Not determined.
Vapour density:	Not determined.
9.2 Other information:	
Appearance:	
Form:	Liquid
Important information on protection of health and environment, and on safety.	
Ignition temperature:	Not determined.
Explosive properties:	Product is not explosive. However, formation of explosive air/vapour mixtures are possible.
Molecular formula	C ₁₀ H ₁₆
Molecular weight	136.23 g/mol
Oxidising properties:	Not determined.
Evaporation rate:	Not determined.

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Information with regard to physical hazard

classes:

Explosives	Void
Flammable gases	Void
Aerosols	Void
Oxidising gases	Void
Gases under pressure	Void
Flammable liquids	Flammable liquid and vapour.
Flammable solids	Void
Self-reactive substances and mixtures	Void
Pyrophoric liquids	Void
Pyrophoric solids	Void
Self-heating substances and mixtures	Void
Substances and mixtures, which emit flammable gases in contact with water	Void
Oxidising liquids	Void
Oxidising solids	Void
Organic peroxides	Void
Corrosive to metals	Void
Desensitised explosives	Void

SECTION 10: Stability and reactivity

10.1 Reactivity: No further relevant information available.

10.2 Chemical stability:

Thermal decomposition / conditions to be avoided:

Stable under constant-temperature (see 7.)

10.3 Possibility of hazardous reactions: No data available.

10.4 Conditions to avoid: No further relevant information available.

10.5 Incompatible materials: Strong oxidising agents.

10.6 Hazardous decomposition products: No data available.

SECTION 11: Toxicological information

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

Acute toxicity: Based on available data, the classification criteria are not met.

Primary irritant effect:

Skin corrosion/irritation: Causes skin irritation.

Serious eye damage/irritation:

Based on available data, the classification criteria are not met.

Respiratory or skin sensitisation: May cause an allergic skin reaction.

Germ cell mutagenicity: Based on available data, the classification criteria are not met.

Carcinogenicity: Based on available data, the classification criteria are not met.

Reproductive toxicity: Based on available data, the classification criteria are not met.

STOT-single exposure: Based on available data, the classification criteria are not met.

STOT-repeated exposure: Based on available data, the classification criteria are not met.

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

Additional toxicological information:

The product should be handled with the care usual when dealing with chemicals.

11.2 Information on other hazards

Endocrine disrupting properties: Substance is not listed.

SECTION 12: Ecological information

12.1 Toxicity:

12.1.1 Aquatic toxicity: The following information is available:

Fish:

 Fish toxicity: LC₅₀ 0.72 mg/L/96h (fish)
 [ECHA, read-across]

Daphnia:

 Daphnia toxicity: EC₅₀ 0.36 mg/L/48h (daphnia)
 [ECHA, read-across]

 Daphnia toxicity: NOEC 0.27 mg/L/21d (daphnia)
 [ECHA, read-across]

Algae, aquatic plants:

 Algal toxicity: EC₅₀ 0.904 mg/L/72h (algae)
 [ECHA, read-across]

 Algal toxicity: NOEC 0.514 mg/L/72h (algae)
 [ECHA, read-across]

12.2 Persistence and degradability: Easily biodegradable

Biodegradability:

Oxygen consumption 85 %/28d (OECD 301 D)

12.3 Bioaccumulative potential:

Due to the distribution coefficient n-octanol/water an accumulation in organisms is possible.

12.4 Mobility in soil: No further relevant information available.

12.5 Results of PBT and vPvB assessment:

PBT: Not applicable.

vPvB: Not applicable.

12.6 Endocrine disrupting properties:

The product does not contain substances with endocrine disrupting properties.

12.7 Other adverse effects:

Remark: Very toxic for fish

Additional ecological information:

General notes:

Water hazard class 2 (German Regulation) (Assessment by list): hazardous for water

Do not allow product to reach ground water, water course or sewage system.

Danger to drinking water if even small quantities leak into the ground.

Also poisonous for fish and plankton in water bodies.

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Very toxic for aquatic organisms

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SECTION 13: Disposal considerations

13.1 Waste treatment methods:

Recommendation:

 Dispose product and packaging in accordance with regional environmental laws.
 Must not be disposed together with household garbage. Do not allow product to reach sewage system.

Uncleaned packaging:

Recommendation: Disposal must be made according to official regulations.

SECTION 14: Transport information

14.1 UN number or ID number:

ADR, IMDG, IATA

UN2052

14.2 UN proper shipping name:

ADR

 U N 2 0 5 2 D I P E N T E N E ,
 ENVIRONMENTALLY HAZARDOUS
 DIPENTENE, MARINE POLLUTANT
 DIPENTENE

IMDG

IATA

14.3 Transport hazard class(es):

ADR


 Class
 Label

 3 Flammable liquids.
 3

IMDG


 Class
 Label

 3.3
 3

IATA


 Class
 Label

 3 Flammable liquids.
 3

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14.4 Packing group:

ADR, IMDG, IATA

III

14.5 Environmental hazards:

 Environmentally hazardous substance,
 liquid; Marine Pollutant

Marine pollutant:

Yes (P)

Yes

Symbol (fish and tree)

Symbol (fish and tree)

Special marking (ADR):

14.6 Special precautions for user:

Warning: Flammable liquids.

 Hazard identification number (Kemler
 code):

30

EMS Number:

F-E,S-E

Stowage Category

A

 14.7 Maritime transport in bulk according to
 IMO instruments:

Not applicable.

Transport/Additional information:

ADR

Limited quantities (LQ)

5L

Excepted quantities (EQ)

Code: E1

 Maximum net quantity per inner packaging:
 30 ml

 Maximum net quantity per outer packaging:
 1000 ml

Transport category

3

Tunnel restriction code

D/E

IMDG

Limited quantities (LQ)

5L

Excepted quantities (EQ)

Code: E1

 Maximum net quantity per inner packaging:
 30 ml

 Maximum net quantity per outer packaging:
 1000 ml

UN "Model Regulation":

 UN 2052 DIPENTENE, 3, III,
 ENVIRONMENTALLY HAZARDOUS

SECTION 15: Regulatory information

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

Directive 2012/18/EU:

Named dangerous substances - ANNEX I: Substance is not listed.

Seveso category

E1 Hazardous to the Aquatic Environment

P5c FLAMMABLE LIQUIDS

Qualifying quantity (tonnes) for the application of lower-tier requirements 100 t

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Qualifying quantity (tonnes) for the application of upper-tier requirements 200 t
 REGULATION (EC) No 1907/2006 ANNEX XVII Conditions of restriction: 3, 40, 75
 DIRECTIVE 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment – Annex II:

Substance is not listed.

REGULATION (EU) 2019/1148

Annex I - RESTRICTED EXPLOSIVES PRECURSORS (Upper limit value for the purpose of licensing under Article 5(3)):

Substance is not listed.

Annex II - REPORTABLE EXPLOSIVES PRECURSORS: Substance is not listed.

National regulations:

Information about limitation of use:

When using chemicals, legal regulations have to be regarded (chemical law, maternity protection, protection of minors).

Waterhazard class: Water hazard class 2 (Assessment by list): hazardous for water.

15.2 Chemical safety assessment:

A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Abbreviations and acronyms:

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)

ICAO: International Civil Aviation Organisation

ICAO-TI: Technical Instructions by the "International Civil Aviation Organisation" (ICAO)

ADR: Accord relatif au transport international des marchandises dangereuses par route (European Agreement Concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

P: Marine Pollutant

GHS: Globally Harmonised System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

DNEL: Derived No-Effect Level (REACH)

PNEC: Predicted No-Effect Concentration (REACH)

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

Flam. Liq. 3: Flammable liquids – Category 3

Skin Irrit. 2: Skin corrosion/irritation – Category 2

Skin Sens. 1: Skin sensitisation – Category 1

Asp. Tox. 1: Aspiration hazard – Category 1

Aquatic Acute 1: Hazardous to the aquatic environment - acute aquatic hazard – Category 1

Aquatic Chronic 1: Hazardous to the aquatic environment - long-term aquatic hazard – Category 1