

Safety Data Sheet

LIMONENE



Revision Date: 10/11/2019

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1. Identification

1.1 Product Identifier

Trade Name or Designation Isolate: LIMONENE
Brand True Terpenes
CAS No. 5989-27-5

1.2 Recommended Use and Restrictions on Use

This product is intended for use only by adults 21 or older. For lawful use only. This product is concentrated and should not be used undiluted. Not for use with tobacco or nicotine. Avoid contact with the skin, eyes, wood surfaces, and fabrics. Keep out of reach of children and pets. Consumers should determine and conduct their own safety standards and testing. The United States Food and Drug Administration, and Center for Disease Control and Prevention, and multiple state governments are investigating numerous instances of severe respiratory illnesses and deaths associated with the use of vaping products. Symptoms include breathing difficulty, shortness of breath, chest pain, mild to moderate gastrointestinal illness, fever, or fatigue. To date, True Terpenes has not received any evidence to suggest that this product has caused any adverse health consequences. Do not use this product if you are pregnant, nursing or a person with or at risk of serious health conditions including but not limited to: heart disease, high blood pressure, diabetes, respiratory illness, or a person taking medicine for depression or asthma. Discontinue use and consult your doctor if and adverse reaction occurs. This product is not intended to diagnose, treat, cure or prevent any disease. This product has not been evaluated for safe use in e-cigarettes or any vaping application where the product(s) is/are intentionally vaporized and inhaled. Multiple state governments have banned the sale of flavors, including terpenes, in vaping applications. These laws are in flux.

1.3 Company Information

Company True Terpenes
Address 2416 N Hayden Island Dr.
Portland, OR 97217 USA
Telephone (888) 954-8550
Website TrueTerpenes.com

1.4 Emergency Contact

CHEMTREC (USA) 800-424-9300
CHEMTREC (International) 1+ 703-527-3887

2. Hazard(s) Identification

2.1 Classification of the Substance or Mixture

For the full text of the Hazard Statements listed below, see Section 16.

Hazard Class	Category	Hazard Statement
Flammable Liquids	Category 3	H226
Skin Irritation	Category 2	H315
Skin Sensitisation	Category 1	H317
Aspiration hazard	Category 1	H304
Acute Aquatic Toxicity	Category 1	H400
Chronic Aquatic Toxicity	Category 1	H410



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2.2 GHS Label Elements

Pictograms



Signal Word

Danger

Hazard Statements

Hazard Number

H226

Hazard Statement

Flammable liquid and vapour.

H304

May be fatal if swallowed and enters airways.

H315

Causes skin irritation.

H317

May Cause an allergic skin reaction.

H410

Very toxic to aquatic life with long lasting effects.

Precautionary Statements

Precautionary Number

P210

Keep away from heat, sparks and open flame. No smoking.

P233

Keep container tightly closed.

P240

Ground/bond container and receiving equipment.

P241

Use explosion-proof electrical/ventilating/lighting equipment.

P242

Use only non-sparking tools.

P243

Take precautionary measures against static discharge.

P261

Avoid breathing dust, fumes, gas, mist, vapors, or spray.

P264

Wash skin 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, eye protection and skin protection.

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.

P321

Specific treatment (see supplemental first aid instructions on this label).

P331

Do NOT induce vomiting.

P333 + P313

If skin irritation or rash occurs: Get medical advice/ attention.

P362

Take off contaminated clothing and wash before reuse.

P370 + P378

In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

P391

Collect spillage.

P403 + P235

Store in a well-ventilated place. Keep cool.



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P405 Store locked up.
P501 Dispose of contents/ container to an approved waste disposal plant

2.3 Hazard(s) not Otherwise Classified (HNOC) - none.

3. Composition / Information on Ingredients

3.1 Components of Substance or Mixture

Chemical Name	Formula	Molecular Weight	CAS Number	EC Number
Limonene	C10H16	136.23 g/mol	5989-27-5	227-813-5

Hazardous Components

Component	Classification	Concentration
Limonene	Flam. Liq. 3; Skin Irrit. 2; Skin Sens. 1; Asp. Tox. 1; Aquatic Acute 1; Aquatic Chronic 1; H226, H304, H315, H317, H400, H410	90.00 - 100.00%

4. First-Aid Measures

4.1 General First Aid Information

General Advice	Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.
If inhaled	If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
In case of eye contact	Flush eyes with water as a precaution.
In case of skin contact	Wash off with soap and plenty of water. Consult a physician.
If swallowed	Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most Important Symptoms / Effects, Acute and Delayed

The most important known symptoms and effects are described in the labeling (see section 2.2) and/or in section 11.

4.3 Indication of any medical attention or special treatment needed

No data available.

5. Fire-Fighting Measures

5.1 Extinguishing Media

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Unsuitable Extinguishing media

Data not available.



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5.2 Specific Hazards Arising from the Substance or Mixture

Carbon oxides.

5.3 Special Protective Equipment for Firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further Information

Use water spray to cool unopened containers.

6. Accidental Release Measures

6.1 Personal Precautions, Protective Equipment and Emergency Procedures

Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas. For personal protection see section 8.

6.2 Environmental Precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Cleanup and Containment Methods and Materials

Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to Other Sections

For disposal see section 13.

7. Handling and Storage

7.1. Precautions for Safe Handling and Storage Conditions

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge. For precautions see section 2.2.

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Recommended storage temperature 2 - 8 °C. Storage class (TRGS 510): 3: Flammable liquids

8. Exposure Controls / Personal Protection

8.1 Control Parameters

Component	CAS Number	Value	Control Parameters	Basis	Remarks
Limonene	5989-27-5	TWA	30 ppm	USA. Workplace Environmental Exposure Levels (WEEL)	

8.2 Exposure Controls

Engineering Controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.



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Eye/Face Protection	Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).
Skin Protection	<p>Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.</p> <p>Full contact Material: Nitrile rubber Minimum layer thickness: 0.4 mm Break through time: 480 min Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)</p> <p>Splash contact Material: Nitrile rubber Minimum layer thickness: 0.11 mm Break through time: 31 min Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M) data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374</p> <p>If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.</p>
Body Protection	Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
Respiratory Protection	Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. Aldrich - 147524 Page 5 of 9 If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).
Control of Environmental Exposure	Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. Physical and Chemical Properties

9.1. Basic Physical and Chemical Properties

Appearance	Clear, colorless to pale yellow liquid
Physical State	Liquid
Odor	Citrus
Odor Threshold	Data not available.
pH	Data not available.
Melting Point / Freezing Point	Melting point/range: -74.3 °C (-101.7 °F)
Initial Boiling Point and Boiling Range	176 - 177 °C (349 - 351 °F) - lit.
Flash Point	50 °C (122 °F)



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Evaporation Rate	Data not available.
Flammability	Data not available.
Flammability / Explosive Limits	Upper explosion limit: 6.1% (V) Lower explosion limit: 0.7% (V)
Vapor Pressure	50 hPa at ca.50 °C (ca.122 °F)
Vapor Density	4.70 - (Air = 1.0)
Relative Density	0.842 g/cm ³ at 20 °C (68 °F)
Solubility (Water)	Immiscible
Partition Coefficient	log Pow: 4.2
Auto-ignition Temperature	245 °C (473 °F) at 995 hPa
Decomposition Temperature	Data not available.
Viscosity	Data not available.
Explosive Properties	Data not available.
Oxidizing Properties	Data not available.
Relative Vapour Density	4.70 - (Air = 1.0)

10. Stability and Reactivity

10.1. Reactivity

Data not available.

10.2. Chemical Stability

Stable under recommended storage conditions.

10.3. Possibility of Hazardous Reactions

Data not available.

10.4. Conditions to Avoid

Heat, flames and sparks.

10.5. Incompatible Materials

Strong oxidizing agents

10.6. Hazardous Decomposition Products

Hazardous decomposition products formed under fire conditions. - Carbon oxides Other decomposition products - No data available In the event of fire: see section 5

11. Toxicological Information

11.1. Information on Toxicological Effects

Acute Toxicity - Oral Exposure

LD50 Oral - Rat - 4,400 mg/kg Remarks: Behavioral: Change on motor activity (specific assay). Respiratory disorder Skin and Appendages: Other: Hair.

Acute Toxicity - Dermal Exposure

LD50 Dermal - Rabbit - > 5,000 mg/kg

Acute Toxicity - Inhalation Exposure

Data not available.

Acute Toxicity - Other Information



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Data not available.

Skin Corrosion and Irritation

Data not available.

Serious Eye Damage and Irritation

Eyes - Rabbit

Result: No eye irritation

(OECD Test Guideline 405)

Respiratory Sensitization

-Mouse

Result: May cause sensitisation by skin contact

(OECD Test Guideline 429)

Skin Sensitization

Data not available.

Germ Cell Mutagenicity

Mouse

Lymphocyte

Result: negative

Rat: male

Result: negative

Carcinogenicity

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC: 3 - Group 3: Not classifiable as to its carcinogenicity to humans (D-Limonene)

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive Toxicity

Data not available.

Specific Target Organ Toxicity from Single Exposure

Data not available.

Specific Target Organ Toxicity from Repeated Exposure

Data not available.

Aspiration Hazard

Data not available.

Additional Toxicology Information

Repeated dose toxicity - Mouse - male and female - No observed adverse effect level - 1,650 mg/kg - Lowest observed adverse effect level - 3,300 mg/kg

RTECS: GW6360000

To the best of our knowledge, the chemical, physical and toxicological properties have not been thoroughly investigated.

Liver - Irregularities - Based on Human Evidence



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12. Ecological Information

12.1. Toxicity

Toxicity to fish flow-through test LC50 - Pimephales promelas (fathead minnow) - 0.72 mg/l - 96 h (D-Limonene)
(OECD Test Guideline 203)

Toxicity to daphnia and other aquatic invertebrates Immobilization EC50 - Daphnia magna (Water flea) - 0.36 mg/l - 48 h
(D-Limonene)

(OECD Test Guideline 209)

Toxicity to bacteria EC50 - Sludge treatment - 3.94 mg/l (D-Limonene)
(OECD Test Guideline 209)

12.2. Persistence and Degradability

Biodegradability Result: Readily biodegradable.
(OECD Test Guideline 301B)

12.3. Bioaccumulative Potential

Data not available.

12.4. Mobility in Soil

Data not available.

12.5. Results of PBT and vPvB Assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted.

12.6. Other Adverse Ecological Effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Very toxic to aquatic life with long lasting effects.

13. Disposal Considerations

13.1 Waste Treatment Methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging

Dispose of as unused product.

14. Transport Information

14.1 Transportation by Land-Department of Transportation (DOT, United States of America)

UN number: 2052 Class: 3 Packing group: III

Proper shipping name: Dipentene

Poison Inhalation Hazard: No

14.2 Transportation by Air - International Air Transport Association (IATA)

UN number: 2052 Class: 3 Packing group: III

Proper shipping name: Dipentene



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14.2 Transportation -International Maritime Dangerous Goods (IMDG)

UN number: 2052 Class: 3 Packing group: III EMS-No: F-E, S-E

Proper shipping name: DIPENTENE

Marine pollutant: yes

Further Information

Data not available.

15. Regulatory Information

15.1 Occupational Safety and Health Administration (OSHA) Hazards

No OSHA hazards.

15.2 Superfund Amendments and Reauthorization Act (SARA) 302 Extremely Hazardous Substances

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

15.3 Superfund Amendments and Reauthorization Act (SARA) 311/312 Hazardous Chemicals

Fire Hazard, Acute Health Hazard, Chronic Health Hazard

15.4 Superfund Amendments and Reauthorization Act (SARA) 313 Toxic Release Inventory (TRI)

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

15.5 Massachusetts Right-to-Know Substance List

No components are subject to the Massachusetts Right to Know Act.

15.6 Pennsylvania Right-to-Know Hazardous Substances

D-Limonene CAS-No. 5989-27-5

15.7 New Jersey Worker and Community Right-to-Know Components

D-Limonene CAS-No. 5989-27-5

15.8 California Proposition 65

This product does not contain any chemicals known to the State of California to cause cancer, birth defects, or any other reproductive harm.

16. Other Information

16.1. Full Text of Hazard Statements referred to under sections 2 and 3.

Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Asp. Tox.	Aspiration hazard
Flam. Liq.	Flammable liquids
Skin Irrit.	Skin Irritation
Skin Sens.	Skin sensitisation
H226	Flammable liquid and vapor.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.



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H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

16.2. Miscellaneous Hazard Classes

Canadian Carcinogenicity Hazard Class	Not Available.
Physical Hazards Not Otherwise Classified (PHNOC)	Not Available.
Health Hazards Not Otherwise Classified (HHNOC)	Not Available.
Biohazardous Infectious Materials Hazard Class	Not Available.

16.3. National Fire Protection Association (NFPA) Rating

Health Hazard	2
Fire Hazard	2
Reactivity Hazard	0

16.4. HMIS Rating

Health	2
Chronic Health Hazard	*
Flammability	2
Physical Hazard	0

16.5 Document Revision

Issue Date	11/01/2018
Revision Date	10/11/2019
Version #	02

Disclaimer
True Terpenes cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for use, handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on knowledge and experience currently available. To date, True Terpenes has not received any evidence to suggest that this product has caused any adverse health consequences. The above information relates only to this product and not to its use in combination with any other material or any particular process, and is designed only as guidance for the handling, use, processing, storage, transportation, and disposal. It should not be considered as a guarantee or quality specification. This product has not been evaluated for safe use in e-cigarettes or any vaping application where the product(s) is/are intentionally vaporized and inhaled. True Terpenes has performed no testing on these products in e-cig/vaping applications. It is the sole responsibility of the individual(s) purchasing this product to assess its safety in the final application. The above information relates only to this product and not to its use in combination with any other material or any particular process and is designed only as guidance for the handling, use, processing, storage, transportation, and disposal, and should not be considered as a guarantee or quality specification. The above information is based on data provided by and collected from recognized sources such as distributors, manufacturers, and technical groups and is considered to be accurate to the best of True Terpenes' knowledge-based upon current information as of the date of this document. It is the responsibility of the user to



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review all safety information about this product and determine its safety and suitability in their own uses, processes, and operations. Appropriate warnings and safe handling procedures should be provided to all handlers and users, taking into account the intended use and the specific conditions and factors relating to such use in accordance with all applicable laws and regulations.

Revision Information

This document has undergone significant changes and should be reviewed in its entirety.

