

SAFETY DATA SHEET

Preparation Date: 11/19/2015

Revision Date: 9/18/2018

Revision Number: G3

1. IDENTIFICATION

Product identifier

Product code: L1599
Product Name: D-LIMONENE, FOOD GRADE

Other means of identification

Synonyms: (+)-4-Isopropenyl-1-methylcyclohexene
 (+)-R-Limonene
 (R)-1-Methyl-4-(1-methylethenyl)cyclohexene
 1-Methyl-4-(1-methylethenyl)cyclohexene
 Cajeputene
 Carvene
 Cinene
 Cyclohexene, 4-isopropenyl-1-methyl-
 D-(+)-Limonene
 R-(+)-Limonene
 d-Limoneno (Spanish)
 d-limonène (French)
 d-p-Mentha-1,8-diene
 p-Mentha-1,8-diene
 p-Mentha-1,8-diene, (R)-(+)-
 optical isomer of Dipentene

CAS #: 5989-27-5
RTECS # GW6360000
CI#: Not available

Recommended use of the chemical and restrictions on use

Recommended use: Cosmetics. Flavoring ingredient. Fragrance ingredient. Solvent.
Uses advised against No information available

Supplier: Spectrum Chemical Mfg. Corp
 14422 South San Pedro St.
 Gardena, CA 90248
 (310) 516-8000

Order Online At: <https://www.spectrumchemical.com>

Emergency telephone number Chemtrec 1-800-424-9300

Contact Person: Martin LaBenz (West Coast)

Contact Person: Ibad Tirmiz (East Coast)

2. HAZARDS IDENTIFICATION

Classification

This chemical is considered hazardous according to the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)


Considered a dangerous substance or mixture according to the Globally Harmonized System (GHS)

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2A
Skin sensitization	Category 1
Aspiration toxicity	Category 1
Flammable liquids	Category 3

Label elements

Danger

Hazard statements
 Causes skin irritation
 Causes serious eye irritation
 May cause an allergic skin reaction
 May be fatal if swallowed and enters airways
 Flammable liquid and vapor



Hazards not otherwise classified (HNOC)

Not Applicable

Other hazards

May be harmful if swallowed

Precautionary Statements - Prevention

Wash face, hands and any exposed skin thoroughly after handling
 Avoid breathing dust/fume/gas/mist/vapors/spray
 Contaminated work clothing must not be allowed out of the workplace
 Keep away from heat/sparks/open flames/hot surfaces. — No smoking
 Keep container tightly closed
 Ground/bond container and receiving equipment
 Use explosion-proof electrical/ventilating/lighting/.../equipment
 Use only non-sparking tools
 Take precautionary measures against static discharge
 Wear protective gloves
 Wear eye/face protection

Precautionary Statements - Response

In case of fire: Use CO2, dry chemical, or foam to extinguish.
 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
 If skin irritation or rash occurs: Get medical advice/attention
 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
 Wash contaminated clothing before reuse
 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
 Do NOT induce vomiting

Precautionary Statements - Storage

Store locked up
 Store in a well-ventilated place. Keep cool

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS-No.	Weight %
D-Limonene	5989-27-5	100

4. FIRST AID MEASURES

First aid measures

- General Advice:** National Capital Poison Center in the United States can provide assistance if you have a poison emergency and need to talk to a poison specialist. Call 1-800-222-1222.
- Skin Contact:** Wash off immediately with soap and plenty of water removing all contaminated clothing and shoes. Get medical attention. If skin irritation persists, call a physician.
- Eye Contact:** Flush eyes with water for 15 minutes. Get medical attention.
- Inhalation:** Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.
- Ingestion:** Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Consult a physician if necessary.

Most important symptoms and effects, both acute and delayed

- Symptoms**
- Causes serious eye irritation
 - Moderately irritating to the skin
 - May cause an allergic skin reaction
 - Aspiration hazard if swallowed - can enter the lungs and cause damage
 - Aspiration into the lungs may cause pulmonary edema
 - Aspiration into the lungs may cause chemical pneumonitis
 - Causes digestive (gastrointestinal) tract irritation
 - May cause abdominal pain, nausea, vomiting, diarrhea
 - Central nervous system effects
 - Weak, rapid pulse or rapid heart rate (Tachycardia)
 - May affect the liver
 - It may affect the kidneys
 - May affect respiration
 - Respiratory depression
 - Dyspnea (Difficulty breathing and shortness of breath)

Indication of any immediate medical attention and special treatment needed

- Notes to Physician:** Treat symptomatically.

Protection of first-aiders

First-Aid Providers: Avoid exposure to blood or body fluids. Wear gloves and other necessary protective clothing. Dispose of contaminated clothing and equipment as bio-hazardous waste.

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: Carbon dioxide (CO₂). Dry chemical. Water spray mist or foam. Alcohol-resistant foam.

Unsuitable Extinguishing Media: Do not use a solid (straight) water stream as it may scatter and spread fire.

Specific hazards arising from the chemical

Product code: L1599

Product name: D-LIMONENE, FOOD
GRADE

3 / 13

Hazardous Combustion Products:	Carbon monoxide; Carbon dioxide
Hazardous Combustion Products:	No information available.
Specific hazards:	Flammable. May be ignited by heat, sparks or flames. Vapor may travel considerable distance to source of ignition and flash back. Vapors may form explosive mixtures with air. Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas (sewers, basements, tanks). Container explosion may occur under fire conditions or when heated. Fire may produce irritating, corrosive and/or toxic gases.
<u>Special Protective Actions for Firefighters</u>	
Specific Methods:	Water mist may be used to cool closed containers. For larger fires, use water spray or fog. Cool containers with flooding quantities of water until well after fire is out.
Special Protective Equipment for Firefighters:	As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions: Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Avoid contact with skin, eyes and clothing. Use personal protective equipment. Remove all sources of ignition. Pay attention to flashback. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use spark-proof tools and explosion-proof equipment. In case of large spill, water spray or vapor suppressing foam may be used to reduce vapors, but may not prevent ignition in closed spaces.

Environmental precautions Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Prevent entry into waterways, sewers, basements or confined areas.

Methods and material for containment and cleaning up

Methods for containment Stop leak if you can do it without risk. Absorb spill with inert material (e.g. vermiculite, dry sand or earth). In case of large spill, dike if needed. Dike far ahead of liquid spill for later disposal.

Methods for cleaning up Use appropriate tools to put the spilled material in a suitable chemical waste disposal container. Use clean non-sparking tools to collect absorbed material. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Precautions for safe handling

Technical Measures/Precautions:

Provide sufficient air exchange and/or exhaust in work rooms. Remove all sources of ignition. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Keep away from incompatible materials.

Safe Handling Advice

Wear personal protective equipment. Use only in well-ventilated areas. Avoid contact with skin, eyes and clothing. Keep away from heat and sources of ignition. Do not breathe vapors or spray mist. Do not ingest. When using do not smoke. Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Technical Measures/Storage Conditions:

Keep container tightly closed in a dry and well-ventilated place. Store at room temperature in the original container. Keep away from heat and sources of ignition. Store in a segregated and approved area. Store away from incompatible materials. Air sensitive.

Incompatible Materials:

Oxidizing agents

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

National occupational exposure limits

United States

Components	CAS-No.	OSHA	NIOSH	ACGIH	AIHA WEEL
D-Limonene	5989-27-5	None	None	None	30 ppm TWA

Canada

Components	CAS-No.	Canada - Alberta	Canada - British Columbia	Canada - Ontario	Canada - Quebec
D-Limonene	5989-27-5	None	None	None	None

Australia and Mexico

Components	CAS-No.	Australia	Mexico
D-Limonene	5989-27-5	None	None

Appropriate engineering controls

Engineering measures to reduce exposure:

Ensure adequate ventilation. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors and mist below their respective threshold limit value.

Individual protection measures, such as personal protective equipment

Personal Protective Equipment

Eye protection:

Goggles

Skin and body protection:

Chemical resistant apron
Long sleeved clothing
Gloves

Respiratory protection:

Vapor respirator. Be sure to use an approved/certified respirator or equivalent.

Hygiene measures:

Avoid contact with skin, eyes and clothing. When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Liquid	Appearance: Clear.	Color: Colorless.
Odor: Pleasant. Citrus-like.	Taste: Fresh. Citrus.	Formula: C10-H16
Molecular/Formula weight (g/mole): 136.23	Flammability: No information available	Flashpoint (°C/°F): 45-48°C/113.4-118.4 °F
Flash Point Tested according to: Closed cup	Autoignition Temperature (°C/°F): 237°C/458.6°F	Lower Explosion Limit (%): 0.7%
Upper Explosion Limit (%): 6.1%	Melting point/range(°C/°F): -95.5 to -74 °C/-139.9 to -102.1 °F	Decomposition temperature(°C/°F): No information available
Boiling point/range(°C/°F): 175-176°C/347-348.8°F	Bulk density: No information available	Density (g/cm3): No information available
Specific gravity: 0.8402 (0.8380-0.8430) @ 25°C 0.841-0.846 @ 20°C	pH: No information available	Vapor pressure @ 20°C (kPa): 0.16-0.2
Evaporation rate: No information available	Vapor density: 4.7	VOC content (g/L): No information available
Odor threshold (ppm): No information available	Partition coefficient (n-octanol/water): log Kow = 4.57	Viscosity: No information available
Miscibility: Miscible with Ethanol Miscible with Ether	Solubility: Practically insoluble in water Soluble in Carbon tetrachloride Soluble in Glycerin Insoluble in Propylene Glycol	

10. STABILITY AND REACTIVITY

Reactivity

Reactive with oxidizing agents

Reacts violently with a mixture of iodine pentafluoride and tetrafluoroethylene, causing fire and explosion hazard

Chemical stability

Stability: Stable under recommended storage conditions.

Possibility of Hazardous Reactions: Hazardous polymerization does not occur

Conditions to avoid: Heat. Ignition sources. Incompatible materials.

Incompatible Materials: Oxidizing agents

Hazardous decomposition products: Carbon monoxide. Carbon dioxide. When heated to decomposition it emits acrid smoke and irritating fumes.

Other Information

Corrosivity: No information available

Special Remarks on Corrosivity: No information available

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Principal Routes of Exposure:

Ingestion. Skin. Eyes. Inhalation.

Acute Toxicity

Component Information

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

LD50/oral/rat = 5200 mg/kg Oral LD50 Rat; 4400 mg/kg Oral LD50 Rat

LD50/oral/mouse = 5600-6600 mg/kg

LD50/dermal/rabbit = >5 g/kg Dermal LD50Rabbit

LD50/dermal/rat = No information available

LC50/inhalation/rat = No information available

LC50/inhalation/mouse = No information available

Other LD50 or LC50information = No information available

Product Information

LD50/oral/rat =

VALUE- Acute Tox Oral = 4400 mg/kg

LD50/oral/mouse =

Value - Acute Tox Oral = 5600 mg/kg

LD50/dermal/rabbit

VALUE-Acute Tox Dermal = > 5000 mg/kg

LD50/dermal/rat

VALUE -Acute Tox Dermal = No information available

LC50/inhalation/rat

VALUE-Vapor = No information available

VALUE-Gas = No information available

VALUE-Dust/Mist = No information available

LC50/Inhalation/mouse

VALUE-Vapor = No information available

VALUE - Gas = No information available

VALUE - Dust/Mist = No information available

Symptoms

Skin Contact:

Contact causes skin irritation. Moderately irritating to the skin. It may be absorbed through the skin. May cause burning sensation, itching, redness. May cause allergic skin reaction/rashes/urticaria (hives).

Eye Contact:

Causes serious eye irritation. Moderately irritating to the eyes.

Inhalation

May cause irritation of respiratory tract. May affect respiration (respiratory depression).

Product code: L1599

Product name: D-LIMONENE, FOOD
GRADE

7 / 13

Ingestion May be harmful if swallowed. Aspiration hazard if swallowed. Aspiration into the lungs can cause chemical pneumonitis. Aspiration may lead to pulmonary edema. May cause digestive (gastrointestinal) tract irritation with nausea, vomiting, diarrhea. May cause abdominal pain. Ingestion may cause coughing and choking due to irritant effects. May affect respiration (dyspnea, respiratory depression). It may cause central nervous system depression. May affect behavior/central nervous system (somnia, ataxia). It may affect behavior/central nervous system (convulsions, excitement). May affect the cardiovascular system (tachycardia). May affect the kidneys (albuminuria, hematuria).

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

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Chronic Toxicity Skin: Sensitizer. May cause allergic skin reaction (allergic contact dermatitis). Prolonged or repeated ingestion may affect the liver, and kidneys.

Sensitization: May cause sensitization by skin contact.

Mutagenic Effects: No information available

Carcinogenic effects: Not classifiable as to its carcinogenicity to humans.

Components	CAS-No.	IARC	ACGIH - Carcinogens	NTP	OSHA HCS - Carcinogens	Australia - Notifiable Carcinogenic Substances	Australia - Prohibited Carcinogenic Substances
D-Limonene	5989-27-5	Monograph 73 [1999]	Not listed	Not listed	Not listed	Not listed	Not listed

ACGIH (American Conference of Governmental Industrial Hygienists)

IARC (International Agency for Research on Cancer)

NTP (National Toxicology Program)

OSHA (Occupational Safety and Health Administration of the US Department of Labor)

Reproductive toxicity No data is available

Reproductive Effects: No information available

Developmental Effects: No information available

Teratogenic Effects: No information available

Specific Target Organ Toxicity

STOT - single exposure No information available.

STOT - repeated exposure No information available.

Target Organs: Skin. Liver. Kidneys.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects: Aquatic environment.

D-Limonene - 5989-27-5

Freshwater Fish Species Data: 0.619 - 0.796 mg/L LC50 Pimephales promelas 96 h flow-through 1 35 mg/L LC50 Oncorhynchus mykiss 96 h 1

Product code: L1599

Product name: D-LIMONENE, FOOD GRADE

8 / 13

Persistence and degradability: No information available

Bioaccumulative potential: Potential for bioconcentration in aquatic organisms is high.

Mobility: It is expected to have low mobility based upon estimated Koc.

13. DISPOSAL CONSIDERATIONS

Disposal Methods

Waste from residues / unused products:
Waste must be disposed of in accordance with Federal, State and Local regulation.

Contaminated packaging:
Empty containers should be taken for local recycling, recovery or waste disposal

Components	CAS-No.	RCRA - F Series Wastes	RCRA - K Series Wastes	RCRA - P Series Wastes	RCRA - U Series Wastes
D-Limonene	5989-27-5	None	None	None	None

14. TRANSPORT INFORMATION

DOT

UN-No: UN2052
Proper Shipping Name: Dipentene
Hazard Class: 3
Subsidiary Class: No information available
Packing group: III
Emergency Response Guide Number: 128
Marine Pollutant: Marine Pollutant
DOT RQ (lbs): No information available
Special Provisions: B1, IB3, T2, TP1
Symbol(s): [DOT]: (P) - Identifies a material that is a marine pollutant.
Description: UN2052, Dipentene, 3, III, Limited quantity

TDG (Canada)

UN-No: UN2052
Proper Shipping Name: Dipentene
Hazard Class: 3
Subsidiary Risk: No information available
Packing Group: III
Marine Pollutant: No Information available
Description: UN2052, Dipentene, 3, III, Limited quantity

ADR

UN-No: UN2052
Proper Shipping Name: Dipentene
Hazard Class: 3
Packing Group: III
Subsidiary Risk: No information available
Description: UN2052, Dipentene, 3, III, Limited quantity, ENVIRONMENTALLY HAZARDOUS

IMO / IMDG

UN-No: UN2052
Proper Shipping Name: Dipentene

Hazard Class: 3
Subsidiary Risk: P
Packing Group: III
Marine Pollutant: Marine Pollutant
EMS: F-E
Description: UN2052, Dipentene, 3, III, Limited quantity, Marine pollutant

RID

UN-No: UN2052
Proper Shipping Name: Dipentene
Hazard Class: 3
Subsidiary Risk: No information available
Packing Group: III
Description: UN2052, Dipentene, 3, III, Limited quantity, ENVIRONMENTALLY HAZARDOUS

ICAO

UN-No: UN2052
Proper Shipping Name: Dipentene
Hazard Class: 3
Subsidiary Risk: No information available
Packing Group: III
Description: UN2052, Dipentene, 3, III

IATA

UN-No: UN2052
Proper Shipping Name: Dipentene
Hazard Class: 3
Subsidiary Risk: No information available
Packing Group: III
ERG Code: 3L
Special Provisions: No information available
Description: UN2052, Dipentene, 3, III

15. REGULATORY INFORMATION

International Inventories

Components	CAS-No.	U.S. TSCA	KOREA KECL	Philippines (PICCS)	Japan ENCS	CHINA	Australia (AICS)	EINECS-No.
<i>D-Limonene</i>	5989-27-5	Present ACTIV E	Present KE-24397	Present	Present (3)-2245,(7)-9 88,(8)-498	Present	Present	Present 227-813-5

U.S. Regulations

D-Limonene

FDA - Food Additives Generally Recognized as Safe (GRAS): 21 CFR 182.60

FDA - 21 CFR - Total Food Additives 182.60

California Prop. 65: Safe Drinking Water and Toxic Enforcement Act of 1986.

Chemicals Known to the State of California to Cause Cancer:

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Chemicals Known to the State of California to Cause Reproductive Toxicity:

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Components	CAS-No.	Carcinogen	Developmental Toxicity	Male Reproductive Toxicity	Female Reproductive Toxicity:

D-Limonene	5989-27-5	Not Listed	Not Listed	Not Listed	Not Listed
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CERCLA/SARA

Components	CAS-No.	CERCLA - Hazardous Substances and their Reportable Quantities	Section 302 Extremely Hazardous Substances and TPQs	Section 302 Extremely Hazardous Substances and RQs	Section 313 - Chemical Category	Section 313 - Reporting de minimis
D-Limonene	5989-27-5	None	None	None	None	None

U.S. TSCA

Components	CAS-No.	TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)	TSCA 8(d) - Health and Safety Reporting
D-Limonene	5989-27-5	Not Applicable	Not Applicable

Canada

WHIMIS 2015 - GHS Classifications

WHMIS 2015 Hazard Classification Information:

Component
D-Limonene
5989-27-5 (100)

WHMIS 2015 Hazard Classification
Flammable liquids - Category 3: H226 Flammable liquid and vapour.; Skin corrosion/irritation - Category 2: H315 Causes skin irritation.; Skin sensitizers - Category 1: H317 May cause allergic skin reaction.; Aspiration hazard - Category 1: H304 May be fatal if swallowed and enters airways.

Canada Hazardous Products Regulation This product has been classified according to the hazard criteria of the HPR (Hazardous Products Regulation) and the SDS contains all of the information required by the HPR

Components	WHMIS Ingredient Disclosure List -
D-Limonene	1 %

Inventory

Components	CAS-No.	Canada (DSL)	Canada (NDSL)
D-Limonene	5989-27-5	Present	Not Listed

Components	CAS-No.	CEPA Schedule I - Toxic Substances
D-Limonene	5989-27-5	Not listed
Components	CAS-No.	CEPA - 2010 Greenhouse Gases Subject to Mandatory Reporting
D-Limonene	5989-27-5	Not listed

EU Classification

EU GHS - SV - CLP 1272/2008

Components	CAS-No.	EU GHS - SV - CLP (1272/2008)
D-Limonene	5989-27-5	Flammable liquids - Flam. Liq. 3: H226 Flammable liquid and vapour.; Skin corrosion/irritation - Skin Irrit. 2: H315 Causes skin irritation.; Skin sensitizers - Skin Sens. 1: H317 May cause allergic skin reaction.; Hazardous to aquatic environment - acute hazard - Aquatic Acute 1: H400 Very toxic to

		aquatic life.; Hazardous to aquatic environment - chronic hazard - Aquatic Chronic 1: H410 Very toxic to aquatic life with long lasting effects.601-029-00-7
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EU - CLP (1272/2008)

R-phrase(s)

- R10 - Flammable.
- R38 - Irritating to skin.
- R43 - May cause sensitization by skin contact.
- R50 - Very toxic to aquatic organisms.
- R53 - May cause long-term adverse effects in the aquatic environment.

S -phrase(s)

- S 2 - Keep out of the reach of children.
- S24 - Avoid contact with skin.
- S37 - Wear suitable gloves.
- S60 - This material and its container must be disposed of as hazardous waste.
- S61 - Avoid release to the environment. Refer to special instructions/safety data sheets.

Components	CAS-No.	Classification	Concentration Limits:	Safety Phrases
D-Limonene	5989-27-5	R10 Xi; R38 R43 N; R50-53	No information	S2 S24 S37 S60 S61

The product is classified in accordance with Annex VI to Directive 67/548/EEC

Indication of danger:

- Xi - Irritant.
- N - Dangerous for the environment.



16. OTHER INFORMATION

Preparation Date: 11/19/2015
Revision Date: 9/18/2018
Prepared by: Sonia Owen

Disclaimer:

All chemicals may pose unknown hazards and should be used with caution. This Safety Data Sheet (SDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. The physical properties reported in this SDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages,

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End of Safety Data Sheet