Florachem Corporation
2664 Port Industrial Drive
Jacksonville, Florida 32226USA
Telephone 1-904-733-5759
Facsimile 1-904-733-5950
Email: info@florachem.com
Website: www.florachem.com

Section 1: Identification

1.1 Product Identifier: D-LIMONENE

1.2 Substance Name: d-Limonene
1.3 Use of the Substance: Solvent.

1.4 Suppliers Details:
Florachem Corporation
2664 Port Industrial Drive
Jacksonville, FL 32226 USA
Phone: 904-733-5759

1.5 Emergency Telephone Numbers
24 hrs Chem-Tel 800-255-3924 [within continental US]
24 hrs 813-248-0585 (collect) [outside continental US]

Section 2: Hazards Identification

2.1 Emergency Overview

2.1 GHS Classification:

Physical Hazards

Flammable Liquids (3)

Health Hazards

Skin Irritation (2)
Skin Sensitizer (1B)
Aspiration Toxicity (1)
Eye Irritation (2A)

Environmental Hazards

Acute Aquatic Toxicity (1)
Chronic Aquatic Toxicity (1)

2.2 GHS Labeling:

2.2.1 Label Elements:

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
H410: Very toxic to aquatic life with long lasting effects
H319: Causes serious eye irritation

Precautionary Statements:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P241: Use explosion-proof electrical, ventilating, lighting, equipment.

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

P273: Avoid release to the environment

P303+361+353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower

P331: Do NOT induce vomiting

P235: Keep cool

P305+351+338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing

P337+313: If eye irritation persists get medical advice/attention

2.3 Other hazards which do not result in classification: None determined.

Section 3: Composition / Information on Ingredients

Common Name	Chemical Name	CAS Number	EINECS No.	Weight %
d-Limonene	(R)-1-methyl-4-(1-methylenthenyl)-Cyclohexene	5989-27-5	277-813-5	> 96
beta-Myrcene	1,6-Octadiene, 7-methyl-3-methylene	123-35-3	204-622-5	0 - 3

beta Myrcene is a naturally occurring impurity, a constituent of the derivative of a botanical food source.

Section 4: First Aid Measures

Inhalation	Remove person to fresh air and keep at rest in a comfortable position for breathing. See a physician if breathing difficulty persists.
Eye contact	EYE CONTACT: Flush eyes with clean water for 15 minutes. If irritation persists, seek medical attention.
Skin contact	In case of skin contact, wash thoroughly with soap and water.
Ingestion	Keep respiratory tract clear. Do Not induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Get medical attention or contact a poison control center for advice

Section 5: Fire-Fighting Measures

Flash point	46°C (115°F) (Pensky Martens Closed Cup)
Auto-ignition temperature	ca. 237°C (459°F)
5.1 Suitable extinguishing media	Water fog or spray, Foam, Dry Powder, Carbon Dioxide (CO2).
Extinguishing media which must not be used	If water must be used, use as a spray only to lower temperature.
5.2 Hazardous decomposition products	FROM FIRE: Smoke, carbon dioxide and carbon monoxide.
Special protective equipment for fire fighters	Self-contained positive pressure breathing apparatus and protective clothing should be worn when fighting fires involving chemicals.
5.3 Precautions for fire fighters	DANGER - FLAMMABLE LIQUID! Vapors may cause flash fires. May cause eye or skin irritation. Harmful or fatal if swallowed. Vapors and spray mist are harmful if inhaled. May produce a floating fire hazard.
Unusual Fire and Explosions Hazards	Containers may explode from internal pressure if confined to fire. Cool with water. Keep unnecessary people away. Exercise care when disposing of rags contaminated with the product. Use normal precautions appropriate for oily rags.

Section 6: Accidental Release Measures

6.1 Protective measures	ELIMINATE ALL SOURCES OF IGNITION. Eliminate all sources of ignition in the vicinity of the spill or released vapor. If this material is released into the work area, evacuate the area immediately. Monitor area with combustible gas indicator. Wear appropriate personal protective equipment when cleaning up spills. Eliminate potential sources of ignition. Handling equipment must be bonded and grounded to prevent sparking.
6.2 Environmental Precautions	This product is a marine pollutant and is very toxic to aquatic organisms. Do not discharge into lakes, streams, ponds or public waters.
6.3 Spill Management	Exercise caution. Eliminate potential sources of ignition. Use spark-proof tools and explosion-proof equipment. Dike and contain spill. Small spills may be absorbed by sand or oil-absorbing materials. Large spills should be collected by pumping into closed containers for recovery or disposal. Spills over water will float and may be collected by oil absorbents and/or by skimming.

Section 7: Handling and Storage

7.1 Precautions for safe handling	Wear chemical safety glasses or goggles and chemically resistant gloves. A chemically resistant apron may be used to protect clothing. A respirator may be worn to prevent breathing spray mists or heated fumes. Take precautionary measures against static discharges.
7.2 Conditions for safe storage	No smoking. Store in original container, preferably in a cool, ventilated, fire-resistant building. Avoid heat, sparks, and open flames. Empty containers may retain product residues (vapor, liquid, or solid) all label precautions must be observed.

Section 8: Exposure Controls / Personal Protection

8.1 Exposure limits	AIHA WEEL 8-hr TWA (d-limonene) 30 ppm
8.2 Appropriate engineering controls	Use in a well-ventilated area.
Ventilation	Mechanical ventilation may be necessary at elevated temperatures to control odors.
8.3 PPE	Consistent with good occupational hygiene practices, personal protective equipment (PPE) should be used in conjunction with other control measures, including engineering controls, ventilation and isolation. See also section 5 (Fire-fighting measure) of the SDS for specific fire/chemical PPE advice.
Respiratory protection	A respirator is not normally required. If vapor concentration is high, use a NIOSH approved organic vapor respirator or a properly fitted, air-purifying or air-fed respirator complying with an approved standard.
Eye protection	Wear chemical safety glasses, goggles or face shield. Provide eye bath near work site.
Skin protection	Wear chemically resistant rubber gloves and apron to minimize exposure.
Personal hygiene measures	When using do not eat or drink. Wash hands and other exposed areas of skin with soap and water after handling the material.

Section 9: Physical and Chemical Properties

Appearance	Clear Yellow to Amber Liquid
Odor	Orange, Citrus
Odor threshold	Not determined.
pH	Not applicable.
Melting point/freezing point	Not determined.
Boiling point (initial)	154°C

Flash point	46°C (115°F) (Pensky Martens Closed Cup)
Evaporation rate (BUAC =1)	Not determined.
Flammability (Solid, gas)	Not determined.
Flammable limits (% by volume in air)	Lower: 0.7 Upper: 6.1
Vapor pressure	0.27 kPa @ 20°C
Relative vapor density (Air=1)	> 1
Relative density	ca. 0.85 specific gravity
Solubility in water	Not determined.
Partition coefficient: n-octanol/water	ca. Log P_{ow} 4.57 (from ChemIDplus TOXNET for d-limonene)
Auto-ignition temperature	ca. 237°C (459°F)
Decomposition temperature	Not determined.
Viscosity	Not determined.

Section 10: Stability and Reactivity

10.1 Reactivity	Not determined.
10.2 Chemical stability	Product is stable and not reactive under conditions of normal use.
10.3 Hazardous polymerization	Hazardous polymerization will not occur.
10.4 Conditions to avoid	Prolonged or excessive heat and/or exposure to air may cause non-hazardous decomposition and/or oxidation.
10.5 Incompatible materials	May react with strong acids, bases, and oxidizing agents.
10.6 Hazardous decomposition products	Incomplete decomposition may produce carbon monoxide. Ultimate decomposition products are carbon dioxide and water.

Section 11: Toxicological Information

Target organs	Eyes. Skin.
Likely routes of exposure	Eye/skin contact.
Medical conditions aggravated by overexposure	No known conditions.
Symptoms related to overexposure	Prolonged exposure may cause skin irritation and/or sensitization.

11.1 Relevant Hazards

11.1 (a) Acute toxicity	From TOXNET ChemIDPlus for d-limonene (http://chem.sis.nlm.nih.gov/chemidplus/rn/5989-27-5): **Rabbit** LD_{50} skin > 5gm/kg (5000mg/kg) Food and Cosmetics Toxicology. Vol. 13, Pg. 825, 1975. **Rat** LD_{50} oral 4400mg/kg (4400mg/kg) SKIN AND APPENDAGES (SKIN): HAIR: OTHER LUNGS, THORAX, OR RESPIRATION: RESPIRATORY DEPRESSION BEHAVIORAL: CHANGES IN MOTOR ACTIVITY (SPECIFIC ASSAY) Oyo Yakuri. Pharmacometrics. Vol. 9, Pg. 387, 1975. From TOXNET ChemIDPlus for Myrcene (http://chem.sis.nlm.nih.gov/chemidplus/rn/123-35-3) **Rabbit** LD_{50} skin > 5gm/kg (5000mg/kg) Food and Cosmetics Toxicology. Vol. 14, Pg. 615, 1976. **Rat** LD_{50} oral > 5gm/kg (5000mg/kg) Food and Cosmetics Toxicology. Vol. 14, Pg. 615, 1976.
11.1 (b) Dermal contact	d-Limonene; skin - mild irritant (rabbit)
11.1 (c) Eye contact	Contact with the undiluted material may cause cause eye irritation.
11.1 (d) Respiratory or Skin sensitization	No known significant effects or critical hazards

11.1 (e) Germ cell mutagenicity	Refer to WHO Concise International Chemcial Assessment Document 5 for Limonene. AMES Test; Negative
11.1 (f) Carcinogenicity	No component of the product is listed as carcinogenic by IARC, ACGIH, and NTP. IARC has classified d-limonene as Group 3: Not classifiable as to its carcinogenicity to humans.
11.1 (g) Reproductive toxicity	Not determined.
11.1 (h) STOT – single exposure	Not determined.
11.1 (i) STOT repeated exposure	Not determined.
11.1 (j) Aspiration Hazard	Component categorized as a Cat 1 Aspiration Hazard.

Section 12: Ecological Information

The product contains a marine pollutant and is toxic to aquatic organisms.

Toxicity	Refer to the WHO (World Health Organization) Concise International Chemical Assessment Document 5 for Limonene for a detailed analysis. **Water flea** (*Daphnia magna*) 48-h LC_{50}; flow-through 0.577 mg/L (0.496-0.672) US EPA, 1990b **Water flea** (*Daphnia magna*) 48-h EC_{50}; flow-through 0.421 mg/L US EPA, 1990b **Fathead minnow** (*Pimephales promelas*) 96-h LC_{50}; flow-through 0.702 mg/L (0.619-0.796) US EPA, 1990b **Green algae** 96-h NOEC; static 4.08 mg/L US EPA, 1990a
Persistence and degradability	Limonene: 92.7% in 21 days per method CEC L33T82.
Bio accumulative potential	Not determined.
Mobility in Soil	Not determined.
Other adverse effects	Not determined.

Section 13: Disposal Considerations

Disposal methods	User must determine proper disposal method and classification when material is declared a waste. Dispose of this material at a local, state or federally approved landfill, incinerator or recovery facility.
Safe handling of wastes	Refer to Section 8 for information pertaining to personal protective equipment and exposure controls when handling this material for disposal.

Section 14: Transport Information

US DOT	UN2319, Terpene Hydrocarbons, N.O.S (d-Limonene), 3, PGIII, Marine Pollutant
ICAO/IATA	UN2319, Terpene Hydrocarbons, N.O.S (d-Limonene), 3, PGIII, Marine Pollutant
IMO/IMDG	UN2319, Terpene Hydrocarbons, N.O.S (d-Limonene), 3, PGIII, Marine Pollutant
USDOT Non-Bulk Packaging Shipping Label	d-LIMONENE (Excepted from HMR as per §173.150 & §171.4) Flammable Liquid, Marine Pollutant

Section 15: Regulatory Information

Chemical Inventories Status

USA	Compliant
Canada	Compliant.
European Community	Compliant.
Australia	Compliant
Japan	Compliant
Korea	Compliant
Philippines	Compliant.
China	Compliant.

USA Federal and States Information

b-Myrcenene is listed on California Prop 65. Please refer to the Naturally Occurring Exemption, **Title 27 of the California Code of Regulations, Article 5, § 25501 Exposure to a Naturally Occurring Chemical in a Food**. The beta myrcene in this product is a naturally occurring impurity, a constituent of the derivative of a botanical food source.

Section 16: Other Information

HMIS classification

Health Hazard	Flammability	Reactivity
1	2	1

Abbreviations & Acronyms: STOT Specific Target Organ Toxicity

Revision Date: 12 June 2018

Supersedes Date: 9 June 2015

Reason for this revision:

20 May 2015 revision due to conversion to GHS Standard. All sections updated.
9 June 2015 revision due to inclusion of b-Myrcene in California's Prop 65. Sections 3, 11, and 16 updated.
12 June 2018 revision due to Cal Prop 65 clarification, Naturall Occuring Exemption notation in Sec 3 and Sec 15

References and Sources for data

US EPA ACToR: Aggregated Computational Toxicology Resource (http://actor.epa.gov/actor/)
EPA High Production Volume Information System (HPVIS) (www.epa.gov/hpv/)
NIH TOXNET (http://toxnet.nlm.nih.gov)
WHO Concise International Chemical Assesment Document (CICAD05.pdf) for Limonene.
CDC NIOSH - National Institute for Occupational Safety and Health (www.cdc.gov/niosh)
RTECS - Register of Toxic Effects of Chemical Substances
§ 25501 Exposure to a Naturally Occurring Chemical in a Food
http://carules.elaws.us/code/t.27_d.4_ch.1_art5_sec.25501