



MATERIAL SAFETY DATA SHEET

2522 Plantation Center Drive
Matthews, NC 28105
(704) 845 9440

www.ciscochem.com

1. PRODUCT NAME: D-Limonene
2. CHEMICAL NAME: Citrus Terpenes
3. SYNONYMS:
4. CAS NUMBER: 8028-48-6
5. COMPOSITION: Orange Terpenes: Cas #: 8028-48-6, % by Wt.: 100%

**IN CASE OF
TRANSPORT EMERGENCY
CONTACT CHEMTREC
USA: 1-800-424-9300
INTERNATIONAL: 1-703-527-3887**

6. PROPERTIES: COLOR: Colorless.
ODOR: Low aroma.
PHYSICAL STATE: Liquid.
BOILING POINT: 349 F (176 C)
MELTING POINT: -140 F (-96 C), thickens at -108 F (-78 C)
SPECIFIC GRAVITY: 0.838 to 0.843 @ 68 F (20 C)
REFRACTIVE INDEX: 1.471 to 1.474
OPTICAL ROTATION: +101.4 TO +104.5
VAPOR PRESSURE: <2mmHg @ 68 F (20 C)
FLASH POINT (CCCFP): >110 F (43 C)
FLAMMABLE LIMITS: LEL approx. 0.7%, UEL approx. 6.1%
AUTOIGNITION TEMPERATURE: 458 F (237 C)
SOLUBILITY IN WATER: Insoluble
EVAPORATION RATE: 0.2 (BuAc=1)
VOLATILE ORGANIC COMPOUND (VOC) CONTENT: >95% by volume.
STABILITY: Stable.
CONDITIONS TO AVOID: Keep away from heat, sparks, and flames.
INCOMPATIBLE MATERIAL: Strong oxidizing agents and strong acids, including acidic clays, peroxides, halogens, vinyl chloride, and iodine pentafluoride.
HAZARDOUS DECOMPOSITION PRODUCTS: Oxides of orange terpenes, which can result from improper storage and handling, are known to cause skin sensitization.
POSSIBILITY OF HAZARDOUS REACTIONS: To prevent oxidation, avoid long-term exposure to air. If storing partially filled container, fill headspace with an inert gas such as nitrogen or carbon dioxide.

7. HAZARDS: Appearance/Odor: Colorless liquid with mild citrus aroma. Product is combustible. Slippery when spilled.
Potential Health Effects: See in Toxicological information Section.
Likely Routes of Exposure: Eye contact, skin contact, inhalation.
Eye: Causes moderate to severe irritation.
Skin: May cause slight redness. Prolonged or repeated exposure may cause drying of the skin.
Inhalation: May cause nose, throat, and respiratory tract irritation, coughing, headache.
Ingestion: Not likely to be toxic, but may cause vomiting, headache, or medical problems. Medical Conditions Aggravated By Exposure: My irritate the skin of people with pre-existing skin conditions.

8. FIRE FIGHTING INFORMATION: SUITABLE EXTINGUISHING MEDIA: Carbon dioxide, foam, or dry chemical. Caution: Carbon dioxide will displace air in confined spaces and may create an oxygen deficient atmosphere.
UNSUITABLE EXTINGUISHING MEDIA: Water.
PRODUCTS OF COMBUSTION: Forms acrid fumes, carbon monoxide, and carbon dioxide.
PROTECTION OF FIREFIGHTERS: Vapors may be irritating to eyes, skin, and respiratory tract. Firefighters should wear self-contained breathing apparatus (SCBA) and full fire-fighting turnout gear.



Carolina International Sales Co., Inc

MATERIAL SAFETY DATA SHEET

2522 Plantation Center Drive
Matthews, NC 28105
(704) 845 9440

www.ciscochem.com

9. PERSONAL EXPOSURE GUIDELINES: d-Limonene: 8h TWA=30 ppm (AIHA Standard)
PROTECTION TWA – TIME WEIGHTED AVERAGE:
MEASURES: ENGINEERING CONTROLS: Provide ventilation. Keep away from sparks and flames.
EYE/FACE PROTECTION: Wear safety glasses or goggles.
SKIN PROTECTION: Nitrile gloves are recommended. Boots, apron, or bodysuit should be worn as necessary.
RESPIRATORY PROTECTION: Not normally required. If adequate ventilation is unavailable, use NIOSH approved air-purifying respiratory with organic vapor cartridge or canister.
GENERAL HYGIENE CONSIDERATIONS: Wash hands thoroughly after handling. Have eyewash and emergency shower facilities immediately available. Launder contaminated clothing before reuse.
10. FIRST AID PROCEDURES: EYE CONTACT: Remove contact lenses at once. Flush with water for at least 15 minutes. If irritation persists, seek medical attention.
SKIN CONTACT: Wash affected area with copious amounts of soap and water. If irritation develops, seek medical attention.
INHALATION: If symptoms of overexposure are experienced, move to fresh air. If symptoms persist, seek medical attention.
INGESTION: Seek medical attention immediately. DO NOT induce vomiting. Rinse mouth with water. DO NOT administer anything by mouth to an unconscious person. DO NOT leave victim unattended.
GENERAL: As with any chemical, employees should thoroughly wash hands with soap and water after handling this material.
11. EXPOSURE LIMITS: 8h TWA=30 ppm (AIHA Standard)
12. TOXICOLOGICAL INFORMATION: ACUTE EFFECTS: Orange terpenes have been shown to have low oral toxicity (LD50>5g/kg) and low dermal toxicity (LD50>5g/kg) when tested on rabbits. Orange terpenes also showed low toxicity by inhalation (RD50>1 g/kg) when tested on mice. The skin irritancy of limonene in guinea pigs and rabbits is considered moderate and low, respectively. Inhalation may cause irritation of the nose, throat, and respiratory tract.
CHRONIC EFFECTS: This product is not classified as a carcinogen by OSHA, IARC, ACGIH, or NTP. This product has not been shown to produce genetic changes when tested on bacterial or animal cells. This product does not contain known reproductive developmental toxins. Prolonged or repeated exposure can cause drying or dermatitis of skin. Improper storage and handling may lead to the formation of a possible skin sensitizer.
13. ECOLOGICAL INFORMATION: ECOTOXICITY: There is no information available at this time for this product. However, a spill may produce significant toxicity to aquatic organisms and ecosystems. Some studies have shown that certain bacteria and fungi have the ability to degrade terpenes, decreasing their toxicity to fish. When spilled, this product may act as an oil, causing a film, sheen, emulsion or sludge at or beneath the surface of a body of water.
PERSISTENCE/DEGRADABILITY: Product is expected to be readily biodegradable.
BIOACCUMULATION/ACCUMULATION: No appreciable bioconcentration is expected in the environment.
MOBILITY IN ENVIRONMENT: Orange terpenes volatilize rapidly.
14. DISPOSAL CONSIDERATIONS: Incinerate or dispose of in accordance with Local, State, and Federal Regulations. Taking regulations into consideration, waste may be incinerated or handled through EPA Spill Control Plan via landfill or dilution. Commercially clean containers prior to disposal. Oil soaked rags should be disposed of properly to prevent spontaneous combustion.



Carolina International Sales Co., Inc

MATERIAL SAFETY DATA SHEET

2522 Plantation Center Drive
Matthews, NC 28105
(704) 845 9440

www.ciscochem.com

15. **CARCINOGENIC PROPERTIES & NOTIFICATIONS:** This product does not contain any carcinogens as listed by OSHA, IARC, ACGIH, or NTP. PROPOSITION 65 – CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986.: This product is not known to contain any chemicals currently listed as carcinogens or reproductive toxins under California Proposition 65 at levels which would be subject to the proposition.
16. **TRANSPORT INFORMATION:** US DOT SHIPPING CLASSIFICATION;
PROPER SHIPPING NAME: TERPENE HYDROCARBONS, N.O.S
HAZARD CLASS: 3
IDENTIFICATION NO.: UN2319
PACKING GROUP: III
LABEL/PLACKARD: exception \$173.150 (f) applies
TDG Status: Hazardous
IMO Status: Hazardous
IATA Status: Hazardous
The listed transportation classification does not address regulatory variations due to changes in package size, mode of shipment, or other regulatory descriptions.
17. **HANDLING & STORAGE:** HANDLING: Keep away from heat, sparks, and flame. Open container slowly to release pressure caused by temperature variations. Do not allow this material to come in contact with eyes. Avoid prolonged contact with skin. Use in well ventilated areas. Do not breathe vapors. Drum lining may occasionally chip and fall to the bottom of container; product should be filtered or strained before blending or repackaging. As with any chemical, employees should thoroughly wash hands with soap and water after handling this material.
STORAGE: Product may be packaged in phenolic-lined steel containers or fluorinated plastic containers. Store in well ventilated area with proper sprinkler/fire deterrent system. Storage temperature should not exceed the flash point for extended periods of time. Keep container closed when not in use. Air should be excluded from partially filled containers by displacing with nitrogen or carbon dioxide. Do not cut, drill, grind, or weld on or near this container; residual vapors may ignite.
18. **ACCIDENTAL RELEASE MEASURES:** PERSONAL PRECAUTIONS: Use personal protection recommended in Personal Protection Section.
Product is slippery when spilled. Isolate the hazard area. Deny entry to unnecessary and unprotected personnel.
ENVIRONMENTAL PRECAUTIONS: Keep out of drains, sewers, ditches, and waterways.
METHODS FOR CONTAINMENT: Dike spill area and cap leaking containers as necessary to prevent further spreading of spilled material. Absorb spilled liquid with suitable material such as dirt or sand.
METHODS FOR CLEAN UP: Eliminate all ignition sources. Use equipment rated for use around combustible materials. Oils soaked rags may spontaneously combust; place in appropriate disposal container.
OTHER INFORMATION: There are no special reporting requirements for spills of this material.
19. **REGULATORY INFORMATION:** OSHA REGULATORY STATUS: This material is combustible , which is defined as having a flush point between 100 F (37.8 C) and 200 F (93.3 C). Combustible materials are hazardous according to the OSHA Hazard Communication Standard (29 CFR 1910.1200).
GLOBAL INVENTORIES: The components of this product are included in the following inventories:
USA (TSCA)
Canada (DSL)
Europe (EINECS/ELINCS/Polymer/NLP)
Australia (AICS)
Korea (KECL)
Philippines (PICCS)
Japan (ENCS)
The United States FDA lists d-limonene as GRAS in 21 CFR section 182.20 and 182.6.



Carolina International Sales Co., Inc

MATERIAL SAFETY DATA SHEET

2522 Plantation Center Drive
Matthews, NC 28105
(704) 845 9440

www.ciscochem.com

This product was produced with Good Manufacturing Practices. This product is a by-product of citrus and entirely of natural origin. This product has not been adulterated or misbranded.

SARA TITLE III (Section 313): This substance contains no materials subject to the reporting requirements of SARA Title III (Section 313)