



Safety Data Sheet

Section 01 - Identification

Product Identifier	D-Limonene
Other Means of Identification	Cyclohexene, terpene hydrocarbons.
Product Use and Restrictions on Use	Soap manufacturing additive, fragrance additive, cleaning solvent.
Initial Supplier Identifier	ClearTech Industries Inc. 1500 Quebec Avenue Saskatoon, SK. Canada S7K 1V7
Prepared By	ClearTech Industries Inc. Technical Writer Phone: 1 (800) 387-7503
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Section 02 - Hazard Identification

GHS-Classification

Skin Corrosion/Irritation	Category 2
Skin Sensitization	Category 1
Acute Aquatic Toxicity	Category 1
Chronic Aquatic Toxicity	Category 1
Aspiration Hazard	Category 1

Physical Hazards

Flammable Liquid	Category 3
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Danger

Hazard Statements

- H226 – Flammable liquid and vapour.
- H315 – Causes skin irritation.
- H317 – May cause an allergic skin reaction.
- H400 – Very toxic to aquatic life.
- H410 – Very toxic to aquatic life with long lasting effects.
- H304 – May be fatal if swallowed and enters airways.

Pictograms



Precautionary Statements

P233 – Keep container tightly closed.

P405 – Store locked up.

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

P210 – Keep away from heat, sparks, open flames, and hot surfaces. — No smoking.

P240 – Ground/bond container and receiving equipment.

P241 – Use explosion-proof electrical, ventilating, lighting, and equipment.

P242 – Use only non-sparking tools.

P243 – Take precautionary measures against static discharge.

P370 + P378 – In case of fire: Use carbon dioxide, dry chemical powder, appropriate foam, water spray or fog for extinction.

P264 – Wash hands thoroughly after handling.

P280 – Wear protective gloves, protective clothing, eye protection, and face protection.

P303 + P361 + P353 – IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin.

P333 + P313 – If skin irritation or rash occurs: Get medical advice/attention.

P362 – Take off contaminated clothing and wash before reuse.

P272 – Contaminated work clothing should not be allowed out of the workplace.

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

P331 – Do NOT induce vomiting.

P261 – Avoid breathing mist, vapours or spray.

P273 – Avoid release to the environment.

P391 – Collect spillage.

P501 – Dispose of contents/container in accordance with all federal, provincial, and/or local regulations including the Canadian Environmental Protection Act.

Section 03 - Composition / Information on Ingredients

Chemical Name	CAS Number	Weight %	Unique Identifiers
D-limonene	5989-27-5	≤ 100%	

Section 04 - First Aid Measures

Inhalation	Remove victim to fresh air. Give artificial respiration only if breathing has stopped. If breathing is difficult, give oxygen. Seek immediate medical attention. Signs and symptoms of exposure to this material through breathing may include; irritation of the nose, throat, airways, headache and dizziness.
Skin Contact / Absorption	Remove contaminated clothing. Wash affected area with soap and water for 15-20 minutes. If irritation persists, seek medical attention. Completely decontaminate clothing before reuse or discard.
Eye Contact	Immediately flush eye(s) with gently flowing, lukewarm water for 30 minutes while forcibly holding the eyelids open to ensure complete irrigation of the eye tissue. If irritation persists, seek medical attention.
Ingestion	Seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth or induce vomiting; place individual on the left side with the head down. Have individual rinse mouth thoroughly with water. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.
Additional Information	Warning: combustible liquid and vapour. May cause eye irritation. May cause skin and respiratory tract irritation. May cause allergic skin reaction. Preexisting disorders of the following organs (or organ system) may be aggravated by exposure to this material: skin, lung, (for example asthma like conditions).

Section 05 - Fire Fighting Measures

Suitable Extinguishing Media	Carbon dioxide, dry chemical powder, appropriate foam, water spray or fog. Firefighting foams, such as multipurpose, alcohol-resistant foams, are recommended for most flammable/combustible liquid fires.
Unsuitable Extinguishing Media	Not Available

Specific Hazards Arising From the Chemical	During a fire, carbon monoxide, carbon dioxide and other irritating/toxic gases and fumes may be generated. Vapours from heated liquid can accumulate in confined spaces resulting in an explosion hazard. Closed containers may rupture violently when heated, such as in a fire.
Special Protective Equipment for Fire-Fighters	Wear NIOSH-approved self-contained breathing apparatus and protective clothing.
Further Information	Not Available

Section 06 - Accidental Release Measures

Personal Precautions / Protective Equipment / Emergency Procedures	Wear appropriate personal protective equipment. Ventilate area. Only enter area with PPE. Stop or reduce leak if safe to do so. Prevent material from entering sewers. Flush with water to remove any residue. Persons not wearing PPE should be excluded from area of spill until clean-up has been completed. Eliminate all ignition sources (flares, flames, including pilot lights, electrical sparks.). Pay attention to the spreading of gases especially at ground level (heavier than air) and to the direction of the wind. Local authorities should be advised if significant spillages cannot be contained.
Environmental Precautions	Prevent material from entering sewers, waterways or confined spaces.
Methods and Materials for Containment and Cleaning Up	Do not touch spilled material. Stop or reduce leak if safe to do so. Contain spill with earth, sand, or absorbent material which does not react with spilled material. Small spills: Soak up spill with absorbent material which does not react with spilled chemical. Put material in suitable, covered, labelled containers. Flush area with water. Contaminated absorbent material may pose the same hazards as the spilled product. Large spills: Contact fire and emergency services and supplier for advice.

Section 07 - Handling and Storage

Precautions for Safe Handling	Use proper equipment for lifting and transporting all containers. Use sensible industrial hygiene and housekeeping practices. Wash thoroughly after handling. Avoid all situations that could lead to harmful exposure.
Conditions for Safe Storage	Store in a cool, dry, dark, ventilated area. Storage temperature 0 to 10°C. Store in original packaging. Storage of partially filled containers should be avoided. 6 month shelf life when stored in original packaging at the above stated conditions.
Incompatibilities	Air or oxygen, strong oxidizing agents, iodine pentafluoride and tetrafluoroethylene, sulphur, tert-butyl peroxybenzoate and Lewis acids or Ziegler-Natta catalysts.

Section 08 - Exposure Controls and Personal Protection

Exposure Limit(s)

Component	Regulation	Type of Listing	Value
D-Limonene	WEEL	TWA	30ppm

Engineering Control(s)

Ventilation Requirements	Mechanical ventilation (dilution or local exhaust), process or personnel enclosure and control of process conditions must be provided in accordance with all fire codes and regulatory requirements. Supply sufficient replacement air to make up for air removed by exhaust systems.
Other	Emergency shower and eyewash must be available and tested in accordance with regulations and be in close proximity.

Protective Equipment

Eyes/Face	Chemical goggles, full-face shield, or a full-face respirator is to be worn at all times when product is handled. Contact lenses should not be worn; they may contribute to severe eye injury.
Hand Protection	Impervious gloves of chemically resistant material (rubber or PVC) should be worn at all times. Wash contaminated clothing and dry thoroughly before reuse.
Skin and Body Protection	Body suite, aprons, and/or coveralls of chemical resistant material should be worn at all times. Wash contaminated clothing and dry thoroughly before reuse. Impervious boots of chemically resistant material should be worn at all times. No special footwear is required other than what is mandated at place of work.
Respiratory Protection	A NIOSH-approved air-purifying respirator with an appropriate cartridge and/or filter may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits (if applicable) or if overexposure has otherwise been determined. Protection provided by air purifying respirators is limited. Use a positive pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are not known or any other circumstances where an air purifying respirator may not provide adequate protection.
Thermal Hazards	Not Available

Section 09 - Physical and Chemical Properties

Appearance

Physical State	Liquid
Colour	Colourless
Odour	Characteristic fresh citrus-like odour
Odour Threshold	0.001ppm

Property

pH	Not Available
Melting Point/Freezing Point	-96.9°C
Initial Boiling Point and Boiling Range	175-176°C
Flash Point	45°C (closed cup)
Evaporation Rate	Not Available
Flammability	Flammable and combustible material.
Upper Flammable Limit	6.1%(V)
Lower Flammable Limit	0.7%(V)
Vapour Pressure (mm Hg, 20°C)	1.6mmHg at 20°C
Vapour Density (Air=1)	4.70
Relative Density	Not Available
Solubility(ies)	Practically insoluble in water. Soluble in all proportions in ethanol and diethyl ether. Soluble in carbon tetrachloride.

Partition Coefficient: n-octanol/water	Log P _{ow} = 4.57
Auto-ignition Temperature	237°C
Decomposition Temperature	450°C
Viscosity	1.10-1.11cSt at 25°C
Explosive Properties	If product is heated above its flash point it will produce vapors sufficient to support combustion. Vapors are heavier than air and may travel along the ground and be ignited by heat, pilot lights, other flames and ignition sources at locations near the point of release. Never use welding or cutting torch on or near drum (even empty) because product (even just residue) can ignite explosively.
Specific Gravity (Water=1)	0.84
% Volatiles by Volume	Not Available
Formula	C ₁₀ H ₁₆
Molecular Weight	136.24

Section 10 - Stability and Reactivity

Reactivity	Limonenes are very sensitive to air or oxygen, reacting rapidly forming hydroperoxides.
Stability	Normally stable.
Possibility of Hazardous Reactions	It is reported that dipentene (d,l-limonene) polymerizes in the vapour phase at 175-550°C.
Conditions to Avoid	Open flames, sparks, electrostatic discharge, heat, elevated temperatures, and other ignition sources, air, sunlight.
Incompatible Materials	Air or oxygen, strong oxidizing agents, iodine pentafluoride and tetrafluoroethylene, sulphur, tert-butyl peroxybenzoate and Lewis acids or Ziegler-Natta catalysts.
Hazardous Decomposition Products	Carbon dioxide, carbon monoxide, hydrocarbons.

Section 11 - Toxicological Information

Acute Toxicity

Component	Oral LD ₅₀	Dermal LD ₅₀	LC ₅₀
D-Limonene	4400mg/kg (rat)	>5000mg/kg (rabbit)	Not Available

Chronic Toxicity – Carcinogenicity

Component	IARC
D-Limonene	Group 3: Not classifiable as to its carcinogenicity to humans.

Skin Corrosion/Irritation	Moderate skin irritant.
Serious Eye Damage/Irritation	Very mild eye irritant.
Ingestion	Swallowing small amounts of this material during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful.
Inhalation	Breathing of vapour mist is possible. Breathing small amounts of this material during normal handling is not likely to cause harmful effects. Breathing large amounts may be harmful. Symptoms are not expected at air concentrations below the recommended exposure limits, if applicable.

Respiratory or Skin Sensitization	Positive results of skin sensitization have been obtained with d-limonene in human and animals. The allergic response is caused by oxidation products of d-limonene, which are formed upon exposure to air.
Germ Cell Mutagenicity	The information located does not suggest that d-limonene is mutagenic.
Reproductive Toxicity	The information located does not suggest that d-limonene is a developmental toxin.
STOT-Single Exposure	Not Available
STOT-Repeated Exposure	Not Available
Aspiration Hazard	If swallowed, d-limonene may enter the airways (be aspirated) during ingestion or vomiting. Severe lung irritation, damage to the lung tissues, and death may result. This conclusion is based on the kinematic-viscosity of d-limonene, and because it is a hydrocarbon similar to turpentine, which can be aspirated.
Synergistic Materials	D-Limonene is used to enhance the skin absorption of drugs. In animal studies, d-limonene has been shown to inhibit formation of some types of tumours when administered with or following treatment with known carcinogens. d-Limonene is being tested as a cancer therapy agent.

Section 12 - Ecological Information

Ecotoxicity

Component	Toxicity to Algae	Toxicity to Fish	Toxicity to Daphnia and Other Aquatic Invertebrates
D-Limonene	Not Available	LC ₅₀ (Pimephales promelas, 96hr): 0.61-0.79mg/L	LC ₅₀ (Daphnia magna, 48hr): 0.577mg/L
Biodegradability	Readily biodegradable.		
Bioaccumulation	An estimated BCF of 660 suggests the potential for bioconcentration in aquatic organisms is high.		
Mobility	If released to soil, d-limonene is expected to have low mobility based upon an estimated Koc of 1,300. Based on a classification scheme, an estimated Koc value of 1,300 determined from a structure estimation method indicates that d-limonene is expected to adsorb to suspended solids and sediment in water (SRC).		
Other Adverse Effects	Not Available		

Section 13 - Disposal Considerations

Waste From Residues/Unused Products	Dispose in accordance with all federal, provincial, and/or local regulations including the Canadian Environmental Protection Act.
Contaminated Packaging	Dispose in accordance with all federal, provincial, and/or local regulations including the Canadian Environmental Protection Act.

Section 14 - Transport Information

UN Number	UN 2052	
UN Proper Shipping Name	DIPENTENE	
Transport Hazard Class(es)	3	
Packaging Group	III	
Environmental Hazards	Listed as a marine pollutant under Canadian TDG Regulations, schedule III.	
Special Precautions	Not Available.	
Transport in Bulk	Not Available.	
Additional Information	<u>Packing Group</u>	<u>Limited Quantity Index</u>
	III	5 L

TDG

Other

Secure containers (full and/or empty) with suitable hold down devices during shipment and ensure all caps, valves, or closures are secured in the closed position.

TDG PRODUCT CLASSIFICATION: This product has been classified on the preparation date specified at section 14 of this MSDS / SDS, for transportation in accordance with the requirements of part 2 of the Transportation of Dangerous Goods Regulations. If applicable, testing and/or published test data regarding the classification of this product are listed in the references at section 16 of this MSDS / SDS.

Section 15 - Regulatory Information

NOTE: THE PRODUCT LISTED ON THIS SDS HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE HAZARD CRITERIA OF THE CANADIAN CONTROLLED PRODUCTS REGULATIONS. THIS SDS CONTAINS ALL INFORMATION REQUIRED BY THOSE REGULATIONS.

Section 16 - Other Information

Preparation Date

August 7, 2015

Note: The responsibility to provide a safe workplace remains with the user. The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment. The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material. It is the responsibility of the user to comply with all applicable laws and regulations.

Attention: Receiver of the chemical goods / SDS coordinator

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If you have any questions or concerns please call our customer service center.

References:

- 1) CHEMINFO
- 2) eChemPortal
- 3) TOXNET
- 4) Transportation of Dangerous Goods Canada
- 5) CHRIS
- 6) HSDB
- 7) ECHA

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