

## MATERIAL SAFETY DATA SHEET

Product Trade Name: **D-LIMONENE**

Revision Date: 05-Jan-2011

**1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

Product Trade Name: D-LIMONENE  
Synonyms: None  
Chemical Family: Terpenes  
Application: Solvent

Manufacturer/Supplier: Halliburton Energy Services  
P.O. Box 1431  
Duncan, Oklahoma 73536-0431  
Emergency Telephone: (281) 575-5000

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**2. COMPOSITION/INFORMATION ON INGREDIENTS**

Substances	CAS Number	PERCENT	ACGIH TLV-TWA	OSHA PEL-TWA
D-Limonene	5989-27-5	60 - 100%	Not applicable	Not applicable

**3. HAZARDS IDENTIFICATION**

**Hazard Overview** May cause eye, skin, and respiratory irritation. May cause headache, dizziness, and other central nervous system effects. May be harmful if swallowed. May cause allergic skin reaction. Combustible.

**4. FIRST AID MEASURES**

**Inhalation** If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult give oxygen. Get medical attention.

**Skin** Wash with soap and water. Get medical attention if irritation persists.

**Eyes** In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention immediately after flushing.

**Ingestion** Get medical attention! If vomiting occurs, keep head lower than hips to prevent aspiration.

**Notes to Physician** Not Applicable

## 5. FIRE FIGHTING MEASURES

Flash Point/Range (F):	120Max: < 122
Flash Point/Range (C):	49Max: < 50
Flash Point Method:	PMCC
Autoignition Temperature (F):	458.0
Autoignition Temperature (C):	Not Determined
Flammability Limits in Air - Lower (%):	0.7
Flammability Limits in Air - Upper (%):	6.1

**Fire Extinguishing Media** Carbon Dioxide, Dry Chemicals, Foam.

**Special Exposure Hazards** Use water spray to cool fire exposed surfaces. Closed containers may explode in fire. Decomposition in fire may produce toxic gases. Vapors are heavier than air and may accumulate in low areas. Vapors may travel along the ground to be ignited at distant locations.

**Special Protective Equipment for Fire-Fighters** Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

**NFPA Ratings:** Health 1, Flammability 2, Reactivity 0

**HMS Ratings:** Health 1, Flammability 2, Reactivity 0

## 6. ACCIDENTAL RELEASE MEASURES

**Personal Precautionary Measures** Use appropriate protective equipment. Wear self-contained breathing apparatus in enclosed areas.

**Environmental Precautionary Measures** Prevent from entering sewers, waterways, or low areas.

**Procedure for Cleaning / Absorption** Isolate spill and stop leak where safe. Remove ignition sources and work with non-sparking tools. Contain spill with sand or other inert materials. Scoop up and remove.

## 7. HANDLING AND STORAGE

**Handling Precautions** Avoid contact with eyes, skin, or clothing. Avoid breathing vapors. Wash hands after use. Launder contaminated clothing before reuse. Ground and bond containers when transferring from one container to another.

**Storage Information** Store away from oxidizers. Store in a cool well ventilated area. Keep from heat, sparks, and open flames. Product has a shelf life of 12 months.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Engineering Controls** Use in a well ventilated area. Local exhaust ventilation should be used in areas without good cross ventilation.

**Respiratory Protection** Not normally needed. But if significant exposures are possible then the following respirator is recommended:  
Organic vapor respirator.

**Hand Protection** Impervious rubber gloves.

**Skin Protection** Rubber apron.

**Eye Protection** Chemical goggles; also wear a face shield if splashing hazard exists.

**Other Precautions**

Eyewash fountains and safety showers must be easily accessible.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

<b>Physical State:</b>	Liquid
<b>Color:</b>	Clear colorless to pale yellow
<b>Odor:</b>	Citrus
<b>pH:</b>	Not Determined
<b>Specific Gravity @ 20 C (Water=1):</b>	0.84
<b>Density @ 20 C (lbs./gallon):</b>	7.0
<b>Bulk Density @ 20 C (lbs/ft3):</b>	Not Determined
<b>Boiling Point/Range (F):</b>	310
<b>Boiling Point/Range (C):</b>	154
<b>Freezing Point/Range (F):</b>	-133.9
<b>Freezing Point/Range (C):</b>	-92.1
<b>Vapor Pressure @ 20 C (mmHg):</b>	2
<b>Vapor Density (Air=1):</b>	4.730
<b>Percent Volatiles:</b>	> 95
<b>Evaporation Rate (Butyl Acetate=1):</b>	< 1
<b>Solubility in Water (g/100ml):</b>	Insoluble
<b>Solubility in Solvents (g/100ml):</b>	ethers alcohols
<b>VOCs (lbs./gallon):</b>	Not Determined
<b>Viscosity, Dynamic @ 20 C (centipoise):</b>	Not Determined
<b>Viscosity, Kinematic @ 20 C (centistokes):</b>	Not Determined
<b>Partition Coefficient/n-Octanol/Water:</b>	4.23
<b>Molecular Weight (g/mole):</b>	136.3

**10. STABILITY AND REACTIVITY**

<b>Stability Data:</b>	Stable
<b>Hazardous Polymerization:</b>	Will Not Occur
<b>Conditions to Avoid</b>	Keep away from heat, sparks and flame. Avoid contact with acids. Avoid contact with aluminum chloride.
<b>Incompatibility (Materials to Avoid)</b>	Strong oxidizers. Strong acids. Pentafluoroethylene.
<b>Hazardous Decomposition Products</b>	Oxides of nitrogen. Acrid fumes. Carbon monoxide and carbon dioxide.
<b>Additional Guidelines</b>	Not Applicable

**11. TOXICOLOGICAL INFORMATION**

<b>Principle Route of Exposure</b>	Eye or skin contact, inhalation.
<b>Inhalation</b>	May cause respiratory irritation. May cause central nervous system depression including headache, dizziness, drowsiness, incoordination, slowed reaction time, slurred speech, giddiness and unconsciousness.
<b>Skin Contact</b>	May cause skin irritation. May be absorbed through the skin and produce effects similar to those caused by inhalation and/or ingestion.
<b>Eye Contact</b>	May cause eye irritation.

<b>Ingestion</b>	May be fatal if swallowed. May cause central nervous system depression including headache, dizziness, drowsiness, muscular weakness, incoordination, slowed reaction time, fatigue blurred vision, slurred speech, giddiness, tremors and convulsions.
<b>Aggravated Medical Conditions</b>	Skin disorders. Eye ailments.
<b>Chronic Effects/Carcinogenicity</b>	Prolonged or repeated exposure may cause central nervous system and brain effects. FDA and WHMIS list D-limonene as Generally Recognized As Safe (GRAS).
<b>Other Information</b>	None known.
<b>Toxicity Tests</b>	
<b>Oral Toxicity:</b>	LD50: > 5000 mg/kg (Rat)
<b>Dermal Toxicity:</b>	Not determined
<b>Inhalation Toxicity:</b>	Not determined
<b>Primary Irritation Effect:</b>	Not determined
<b>Carcinogenicity</b>	Not determined
<b>Genotoxicity:</b>	Not determined
<b>Reproductive / Developmental Toxicity:</b>	Not determined

## 12. ECOLOGICAL INFORMATION

<b>Mobility (Water/Soil/Air)</b>	Not determined
<b>Persistence/Degradability</b>	BOD(28 Day): 100% of COD
<b>Bio-accumulation</b>	Not determined

### Ecotoxicological Information

<b>Acute Fish Toxicity:</b>	Not determined
<b>Acute Crustaceans Toxicity:</b>	Not determined
<b>Acute Algae Toxicity:</b>	Not determined
<b>Chemical Fate Information</b>	Not determined
<b>Other Information</b>	Not applicable

## 13. DISPOSAL CONSIDERATIONS

<b>Disposal Method</b>	Disposal should be made in accordance with federal, state, and local regulations.
<b>Contaminated Packaging</b>	Follow all applicable national or local regulations.

## 14. TRANSPORT INFORMATION

### Land Transportation

DOT

UN2319, Terpene Hydrocarbons, N.O.S., 3, III, (46.1 C)  
NAERG 128

#### Canadian TDG

Terpene Hydrocarbons, N.O.S., 3, UN2319, III, (46.1 C)

#### ADR

UN2319, Terpene Hydrocarbons, N.O.S., 3, III

### Air Transportation

#### ICAO/IATA

UN2319, Terpene Hydrocarbons, N.O.S., 3, III

### Sea Transportation

#### IMDG

UN2319, Terpene Hydrocarbons, N.O.S., 3, III, (46.1 C)  
EmS F-E, S-D

### Other Shipping Information

Labels: Flammable Liquid

## 15. REGULATORY INFORMATION

### US Regulations

US TSCA Inventory	All components listed on inventory or are exempt.
EPA SARA Title III Extremely Hazardous Substances	Not applicable
EPA SARA (311,312) Hazard Class	Acute Health Hazard Fire Hazard
EPA SARA (313) Chemicals	This product does not contain a toxic chemical for routine annual "Toxic Chemical Release Reporting" under Section 313 (40 CFR 372).
EPA CERCLA/Superfund Reportable Spill Quantity	Not applicable.
EPA RCRA Hazardous Waste Classification	If product becomes a waste, it does meet the criteria of a hazardous waste as defined by the US EPA, because of:  Ignitability D001
California Proposition 65	All components listed do not apply to the California Proposition 65 Regulation.
MA Right-to-Know Law	Does not apply.
NJ Right-to-Know Law	Does not apply.
PA Right-to-Know Law	Does not apply.

## Canadian Regulations

Canadian DSL Inventory	All components listed on inventory.
WHMIS Hazard Class	B3 Combustible Liquids D2B Toxic Materials

## 16. OTHER INFORMATION

The following sections have been revised since the last issue of this MSDS

Not applicable

### Additional Information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

### Disclaimer Statement

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\*\*\*END OF MSDS\*\*\*