Infosafe No™ 1CHJD Issue Date :January 2021 RE-ISSUED by CHEMSUPP

Product Name **D-LIMONENE**

Classified as hazardous

1. Identification

GHS Product Identifier	D-LIMONENE
Company Name	CHEMSUPPLY AUSTRALIA PTY LTD (ABN 19 008 264 211)
Address	38 - 50 Bedford Street GILLMAN SA 5013 Australia
Telephone/Fax Number	Tel: (08) 8440-2000
Emergency phone number	CHEMCALL 1800 127 406 (Australia) / +64-4-917-9888 (International)
E-mail Address	www.chemsupply.com.au
Recommended use of the chemical and restrictions on use	Flavouring, fragrance and perfume materials, cosmetic products, odour agents, food/foodstuff additives, food manufacturing, solvent, wetting agent, resin manufacture, medicines, e.g., bitter alkaloids, intermediates, botanical insecticide, degreaser, dispersing agent, paint stripper, tar and asphalt remover, cleaning/washing agents and disinfectants, printing press cleaner, carpet stain cleaner, hand cleaner, floor cleaner, metal cleaner, electronics cleaning, graffiti remover, heat transfer medium, aerosol ingredient and replacement for toxic chlorinated solvents. Laboratory solvent.

Other Names

Name	Product Code
D-LIMONENE TG Citrus oil, Cinene, Limonene, Cajeputene, p-Mentha-1,8-diene, Kautschin, 1-Methyl-4-(1-methylethenyl)cyclohexene, 1-Methyl-4-isopropenyl-1-cyclohexene, 4-Isopropenyl-1-methyl-1-cyclohexene, Citrus terpenes, Orange terpenes, Menthadiene	LT064
D-LIMONENE LR	LL064

Other Information

ChemSupply Australia Pty Ltd does not warrant that this product is suitable for any use or purpose. The user must ascertain the suitability of the product before use or application intended purpose. Preliminary testing of the product before use or application is recommended. Any reliance or purported reliance upon ChemSupply Australia Pty Ltd with respect to any skill or judgement or advice in relation to the suitability of this product of any purpose is disclaimed. Except to the extent prohibited at law, any condition implied by any statute as to the merchantable quality of this product or fitness for any purpose is hereby excluded. This product is not sold by description. Where the provisions of Part V, Division 2 of the Trade Practices Act apply, the liability of ChemSupply Australia Pty Ltd is limited to the replacement of supply of equivalent goods or payment of the cost of replacing the goods or acquiring equivalent goods.

2. Hazard Identification

GHS classification of the substance/mixture	Flammable Liquids: Category 3 Aspiration Hazard: Category 1 Skin Corrosion/Irritation: Category 2 Sensitization - Skin: Category 1 Hazardous to the Aquatic Environment - Acute Hazard: Category 1 Hazardous to the Aquatic Environment - Long-Term Hazard: Category 1
Signal Word (s)	DANGER
Hazard Statement (s)	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.
Pictogram (s)	Flame, Health hazard, Exclamation mark, Environment

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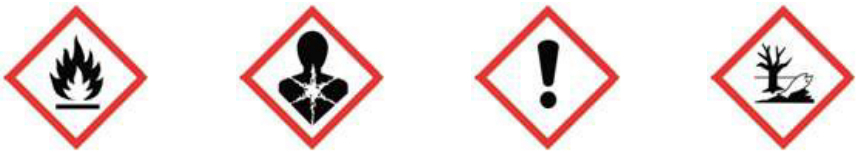

Precautionary statement – Prevention	P210 Keep away from heat/sparks/open flames/hot surfaces. – No smoking. P233 Keep container tightly closed. P240 Ground/bond container and receiving equipment. P241 Use explosion-proof electrical/ventilating/lighting/.../equipment. P242 Use only non-sparking tools. P243 Take precautionary measures against static discharge. P261 Avoid breathing dust/fume/gas/mist/vapours/spray. P264 Wash thoroughly after handling. P272 Contaminated work clothing should not be allowed out of the workplace. P273 Avoid release to the environment. P280 Wear protective gloves/protective clothing/eye protection/face protection.
Precautionary statement – Response	P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. P331 Do NOT induce vomiting. P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. P302+P352 IF ON SKIN: Wash with plenty of soap and water. P332+P313 If skin irritation occurs: Get medical advice/attention. P362 Take off contaminated clothing and wash before reuse. P370+P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction. P391 Collect spillage.
Precautionary statement – Storage	P403+P235 Store in a well-ventilated place. Keep cool. P405 Store locked up.
Precautionary statement – Disposal	P501 Dispose of contents/container according to an approved waste disposal plant.

3. Composition/information on ingredients

Ingredients	Name	CAS	Proportion
	D-Limonene	5989-27-5	90-100 %

4. First-aid measures

Inhalation	If inhaled, remove from contaminated area to fresh air immediately. Apply artificial respiration if not breathing. If breathing is difficult, give oxygen. Immediately obtain medical aid if cough or other symptoms appear.
Ingestion	Rinse mouth thoroughly with water immediately, repeat until all traces of product have been removed. DO NOT INDUCE VOMITING. Seek medical attention immedately.
Skin	Wash affected areas with copious quantities of water immediately. Remove contaminated clothing and wash before re-use. Seek medical attention if irritation develops or persists.
Eye contact	Immediately irrigate with copious quantity of water for at least 15 minutes. Eyelids to be held open. Seek medical attention.
First Aid Facilities	Maintain eyewash fountain and drench facilities in work area.
Advice to Doctor	Treat symptomatically based on judgement of doctor and individual reactions of the patient.
Other Information	For advice, contact a Poisons Information Centre (Phone eg Australia 13 1126; New Zealand 0800 764 766) or a doctor.

5. Fire-fighting measures

Hazards from Combustion Products	Irritating and toxic fumes and gases, carbon monoxide, carbon dioxide.
Specific Methods	Caution: Use of water spray when fighting fire may be inefficient. Small fire: Use foam, dry chemical, CO2 or water spray.

	Large fire: Use foam, fog or water spray - Do not use water jets. If safe to do so, move undamaged containers from fire area. Cool containers with flooding quantities of water until well after fire is out. Avoid getting water inside containers.
Specific hazards arising from the chemical	HIGHLY FLAMMABLE: These products have a low flash point - Easily ignited by heat, sparks or flames at ambient temperatures. Vapours will form explosive mixtures with air. Vapours will travel to source of ignition and flash back. Fire may produce irritating, poisonous and/or corrosive gases. Containers may explode when heated. Produce is lighter than water. Vapours is heavier than air and will collect in low or confined areas (drains, basements, tanks). Vapours from run-off may create an explosion hazard.
Hazchem Code	3Y
Precautions in connection with Fire	SCBA and structural firefighter's uniform may provide limited protection. Fully-encapsulating, gas-tight suits should be worn for maximum protection.

6. Accidental release measures

Spills & Disposal	ELIMINATE all ignition sources (no smoking, flares, sparks or flame) within at least 50m - All equipment used in handling the product must be earthed. Do not touch or walk through spilled material. Stop leak if safe to do so - Prevent entry into waterways, drains or confined areas. Vapour-suppressing foam may be used to control vapours. Absorb spill with earth, sand or other non-combustible material - Use clean, non-sparking tools to collect material and place it in loosely-covered metal or plastic containers for later disposal. Water spray may be used to knock down or divert vapour clouds. SEEK EXPERT ADVICE ON HANDLING AND DISPOSAL.
Personal Precautions	Avoid substance contact. Avoid generation of dusts: do not inhale dusts. Ensure supply of fresh air in enclosed rooms. Evacuate the area of all non-essential personnel. Remove ignition sources.
Personal Protection	Wear protective clothing specified for normal operations (see Section 8)
Clean-up Methods - Small Spillages	Absorb or contain liquid with sand, earth or spill control material. Shovel up using non sparking tools and place in a labelled, sealable container for subsequent safe disposal. Put leaking containers in a labelled drum or overdrum.
Clean-up Methods - Large Spillages	Seek expert advice on handling and disposal.
Environmental Precautions	Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers.

7. Handling and storage

Precautions for Safe Handling	Avoid ingestion and inhalation of gas/fumes/vapour/spray mist. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure. Keep container tightly closed and sealed until ready for use. Ensure good ventilation at the workplace. Use only with adequate ventilation. If ingested, seek medical advice immediately and show the container or the label. Wear suitable protective clothing. Flameproof equipment is necessary in areas where this product is used. Fumes can combine with air to form an explosive mixture. Keep away from heat and all sources of ignition. Do NOT smoke. Keep away from incompatibles such as oxidizing agents. Take precautionary measures against static discharges. All electrical equipment must be flameproofed. Ground all equipment containing material. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.
Conditions for safe storage, including any incompatibilities	Store in a segregated and approved Flammables area. Store small containers in suitable flammable liquid storage cabinets when not in use. Larger drums (200l) must be kept in purpose-built stores. Store in original, labelled, tightly sealed container, in cool, dry, well-ventilated area, away from incompatible substances. Store protected from direct sunlight and moisture. Store away from strong acids, chlorates, perchlorates, chromates and dichromates, nitrates and other oxidising agents. Store away from heat and sources of ignition. Do not weld or cut empty containers. Partially filled

	containers should be blanketed with nitrogen. Segregate from food, animal feed, or medical supplies. Store in an area without drain or sewer access. Do not store in places where flooding is possible or in places where spillage or leaking into wells, drains, ground water, or surface water is possible.
Corrosiveness	Not considered to be corrosive for metals and glass.
Storage Regulations	Refer Australian Standard AS 1940-2017 'The storage and handling of flammable and combustible liquids'. Store at room temperature (15°C to 25°C recommended).
Handling Temperatures	Avoid temperatures above 48°C.
Storage Temperatures	Store at room temperature (15 to 25 °C recommended).
Unsuitable Materials	As d-Limonene has a tendency to cause many polymeric materials to swell, certain plastics are unsuitable, these include ABS, urethane, styrofoam, etc.
Additional information on precautions for use	Rags or other combustible material wet or soaked in limonene may autoxidise, generating heat and igniting spontaneously. Used oily rags should be collected regularly and either soaked in water or stored in closed metal containers.

8. Exposure controls/personal protection

Other Exposure Information	These Workplace Exposure Standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These workplace exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity. The exposure value at the TWA is the average airborne concentration of a particular substance when calculated over a normal 8 hour working day for a 5 day working week.
Appropriate engineering controls	Provide sufficient ventilation to ensure that the working environment is below the TWA (time weighted average). Where vapours or mists are generated, particularly in enclosed areas, and natural ventilation is inadequate, a flame proof exhaust ventilation system is required. Refer to AS 1940-The storage and handling of flammable and combustible liquids and AS 2430-Explosive gas atmospheres for further information concerning ventilation requirements.
Respiratory Protection	Where ventilation is not adequate, respiratory protection may be required. Avoid breathing vapours or mists. Select and use respirators in accordance with AS 1716 - Respiratory Protective Devices and be selected in accordance with AS 1715 - Selection, Use and Maintenance of Respiratory Protective Devices. When mists or vapours exceed the exposure standards then the use of the following is recommended: Approved respirator with organic vapour and dust/mist filters. Filter capacity and respirator type depends on exposure levels.
Eye Protection	The use of a face shield, chemical goggles or safety glasses with side shield protection as appropriate. Must comply with Australian Standards AS 1337 and be selected and used in accordance with AS 1336.
Hand Protection	Wear gloves of impervious material conforming to AS/NZS 2161: Occupational protective gloves - Selection, use and maintenance. Final choice of appropriate glove type will vary according to individual circumstances. This can include methods of handling, and engineering controls as determined by appropriate risk assessments. Avoid skin contact when removing gloves from hands, do not touch the gloves outer surface. Dispose of gloves as hazardous waste.
Personal Protective Equipment	Personal protective equipment should not solely be relied upon to control risk and should only be used when all other reasonably practicable control measures do not eliminate or sufficiently minimise risk. Guidance in selecting personal protective equipment can be obtained from Australian, Australian/New Zealand or other approved standards.
Footwear	Safety boots in industrial situations is advisory, foot protection should comply with AS 2210, Occupational protective footwear - Guide to selection, care and use.
Body Protection	Flame retardant antistatic protective clothing. Clean clothing or protective clothing should be worn, preferably with an apron. Clothing for protection against chemicals should comply with AS 3765 Clothing for Protection Against Hazardous Chemicals.

Hygiene Measures	Always wash hands before smoking, eating or using the toilet. Wash contaminated clothing and other protective equipment before storing or re-using.

9. Physical and chemical properties

Form	Liquid
Appearance	Clear, colourless to yellow liquid.
Odour	Strong, pleasant fruit-, citrus- or lemon-like odour.
Melting Point	-74 °C
Boiling Point	176 °C
Solubility in Water	Practically insoluble (13.8 mg/L at 25 °C).
Solubility in Organic Solvents	Soluble in all proportions in alcohol. Easily soluble in diethyl ether. Soluble in carbon tetrachloride. Insoluble in propylene glycol.
Specific Gravity	0.84
Vapour Pressure	<3 mm Hg (0.40 kPa) at 14 °C
Vapour Density (Air=1)	4.7
Evaporation Rate	<1 (ether=1); < 1 (butyl acetate =1).
Viscosity	1.28 cST at 20 °C
Volatile Component	>95 %vol
Partition Coefficient: n-octanol/water	Log Kow = 4.57; Log P(o/w): 4.23.
Surface Tension	25 mN/m at 22 °C
Flash Point	48 °C (closed cup).
Flammability	HIGHLY FLAMMABLE. Keep away from heat, sparks or naked flames. Use flameproof equipment and fittings to prevent flammability risk. Electrically link and ground metal containers for transfer of the product to prevent accumulation of static electricity. Ensure adequate ventilation to prevent an explosive vapour-air mixture. Vapours will travel considerable distances to sources of ignition.
Auto-Ignition Temperature	237 °C
Flammable Limits - Lower	0.7 %vol at 150 °C
Flammable Limits - Upper	6.1 %vol at 262 °C
Explosion Properties	Autoxidation facilitated by light and air. Rags or other combustible material wet or soaked in limonene may autoxidise, generating heat and igniting spontaneously. If limonene containing oxidation products is concentrated, e.g. by distillation, explosive levels of peroxide may be formed. Addition of stabilisers (antioxidants) should be considered. Containers may explode in the heat of a fire. Above 48 °C explosive vapour/air mixtures may be formed. Increased risk of fire and explosion with oxidizing agents.
Molecular Weight	136.26
Saturated Vapour Concentration	<4000 ppm at 14 °C (calculated)
Other Information	Taste: Fresh, citrus taste. Index of refraction: 1.473 at 20 °C/D. Specific Optical Rotation: +123.8° at 20 °C. Conversion Factor: 1 ppm = 5.56 mg/m³; 1 mg/m³ = 0.18 ppm at 25 °C. Aniline point: -15 °C.

10. Stability and reactivity

Chemical Stability	Stable under normal temperatures, pressures and conditions of use and storage. Slow autoxidation to form a film facilitated by light and air, oxidation behaviour similar to that of rubber or drying oils. Easily oxidised in moist air to carveol and carvone. Rags or other combustible material wet or soaked in limonene may autoxidise, generating heat and igniting spontaneously. Used oily rags should be collected regularly and either soaked in water or stored in closed metal containers. Addition of stabilisers (antioxidants) should be considered.
Conditions to Avoid	Distillation of limonene that may contain peroxides (if limonene containing oxidation products is concentrated, e.g. by distillation, explosive levels of peroxide may be formed), excess heat, ignition sources (flame, sparks, static discharge), prolonged exposure to air, moist air, soaking or wetting of rags in the substance, and incompatible materials.
Incompatible Materials	Air, light, acids, and oxidising agents such as chlorates, perchlorates, nitrates, chromates and dichromates, combination of iodine tetrafluoride or iodine pentafluoride and tetrafluoroethylene, dry hydrogen chloride or hydrogen bromide, polymerisation catalysts such as alumimium chloride and acidic clays, sulfur with oxidation.
Hazardous Decomposition Products	Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide, acrid smoke and fumes.
Possibility of hazardous reactions	Hazardous reactions with strong acids and polymerisation catalysts such as alumimium chloride and acidic clays. Reacts violently with a mixture of iodine pentafluoride or iodine tetrafluoride and tetrafluoroethylene, causing fire and explosion hazard. Reactive with oxidizing agents with increased risk of fire and explosion. Limonene reacts with dry hydrogen chloride or hydrogen bromide to form monohalides.
Hazardous Polymerization	Polymerization is not hazardous. May polymerize slowly in the presence of air.

11. Toxicological Information

Toxicology Information	No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. If mishandled or overexposed to this product the following symptoms or effects may occur.
Acute Toxicity - Oral	LD50 (rat): 4400 - 5,200 mg/kg
Ingestion	Ingestion may cause vomiting, headache, diarrhoea, painful constrictions and proteinuria. Aspiration may cause lung damage. Symptoms after absorption of toxic quantities may include CNS disorders and/or cardiovascular disorders.
Inhalation	Vapour or mists may cause irritation of mucous membranes of the respiratory system, coughing, dyspnoea and headache. No nasal or pharyngeal irritation has been reported. Strong odour causes discomfort in some people. May cause dizziness and suffocation. Readily absorbed through inhalation. Aspiration of large doses may produce pulmonary oedema and chemical pneumonitis.
Skin	Causes skin irritation. Symptoms can include redness, itching, burning, aching, long-lasting purpuric rash, possible defatting and dermatitis. It can be absorbed through intact skin. However, it is generally regarded to have low toxicity by dermal route. Risk of sensitisation, an allergic reaction, which becomes evident upon re-exposure to this material.
Eye	Eye contact can cause slight irritation and reddening.
Respiratory sensitisation	Not classified based on available information.
Skin Sensitisation	Sensitization - Skin: Category 1 H317 May cause an allergic skin reaction.
Germ cell mutagenicity	Not classified based on available information.
Carcinogenicity	d-Limonene [5989-27-5] is evaluated in the IARC Monographs (Vol. 73; 1999) as Group 3: Not classifiable as to carcinogenicity to humans. Not classified based on available information.

Reproductive Toxicity	Not classified based on available information.
STOT-single exposure	Not classified based on available information.
STOT-repeated exposure	Not classified based on available information.
Aspiration Hazard	Aspiration Hazard: Category 1 H304 May be fatal if swallowed and enters airways.
Chronic Effects	Prolonged or repeated ingestion may produce nausea, lowered blood sugar and cholesterol, and kidney damage (hematuria, albuminuria, tubular necrosis), and may also affect the liver. Repeated or prolonged skin contact can cause drying, defatting of skin and can cause an allergic skin response (redness, swelling, itching). The allergic response is caused by oxidation products of d-limonene, which are formed upon exposure to air. d-Limonene of very high purity is not expected to produce an allergic response.
Mutagenicity	Not classified based on available information.

12. Ecological information

Ecotoxicity	Highly toxic for aquatic organisms. May cause long-term adverse effects in the aquatic environment.
Persistence and degradability	This material is partically biodegradable.
Bioaccumulative Potential	An appreciable bioaccumulation potential is to be expected (log P(o/w) >3).
Known Harmful Effects on the Environment	Highly toxic to aquatic life. May cause long-term adverse effects in the aquatic environment.
Environmental Protection	Do not allow to enter waters, waste water, or soil!
Acute Toxicity - Fish	Pimephales promeias - 0.619 - 0.796 mg/l - 96hr flow through test.
Acute Toxicity - Daphnia	EC50 - Daphnia magna - 0.577 mg/l -48hr

13. Disposal considerations

Disposal Considerations	Dispose of according to relevant local, state and federal government regulations.

14. Transport information

Transport Information	Dangerous Goods of Class 3 Flammable Liquids, are incompatible in a placard load with any of the following: - Class 1, Class 2.1, if both the Class 3 and Class 2.1, dangerous goods are in bulk, Class 2.3, Class 4.2, Class 5, Class 6, if the Class 3 dangerous goods are nitromethane and Class 7.
U.N. Number	2052
UN proper shipping name	DIPENTENE
Transport hazard class(es)	3
Hazchem Code	3Y
Packing Group	III
EPG Number	3A1
IERG Number	14
Environmental Hazards	Highly toxic for aquatic organisms. May cause long-term adverse effects in the aquatic environment. May bioaccumulate.

15. Regulatory information

Regulatory Information	All the constituents of this product are listed on the Australian Inventory of Chemical Substances (AICS), or exempted. Not listed under WHS Regulation 2011, Schedule 10 - Prohibited carcinogens, restricted carcinogens and restricted hazardous chemicals.
Poisons Schedule	Not Scheduled

16. Other Information

Literature References	'Standard for the Uniform Scheduling of Medicines and Poisons .', Commonwealth of Australia. National Road Transport Commission, 'Australian Code for the Transport of Dangerous Goods by Road and Rail 7th. Ed.'. Safe Work Australia, 'National Code of Practice fot the Preparation of Safety Data Sheets for Hazardous Chemicals'. Standards Australia, 'SAA/SNZ HB 76:2010 Dangerous Goods - Initial Emergency Response Guide', Standards Australia/Standards New Zealand. Safe Work Australia, 'Hazardous Chemical Information System'. Safe Work Australia, 'National Code of Practice for the Labelling of Safe Work Hazardous Substances'. Safe Work Australia, 'National Exposure Standards for Atmospheric Contaminants in the Occupational Environment'.
Contact Person/Point	Paul McCarthy Ph. (08) 8440 2000 DISCLAIMER STATEMENT: All information provided in this data sheet or by our technical representatives is compiled from the best knowledge available to us. However, since data, safety standards and government regulations are subject to change and the conditions of handling and use, or misuse, are beyond our control, we make no warranty either expressed or implied, with respect to the completeness or accuracy to the information contained herein. ChemSupply Australia Pty Ltd accepts no responsibility whatsoever for its accuracy or for any results that may be obtained by customers from using the data and disclaims all liability for reliance on information provided in this data sheet or by our technical representatives.
Empirical Formula & Structural Formula	Empirical Formula: C10-H16. Structural Formula: CH3-C6H8-C(CH3)=CH2.

...End Of MSDS...