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SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Product: D-Limonene	**Revision date:** 2026-10-29	**Version:** 1.0	**Brand:** Richest

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product name	D-Limonene
Synonyms	(R)-(+)-Limonene; (+)-p-Mentha-1,8-diene; (R)-4-Isopropenyl-1-methyl-1-cyclohexene
CAS No.	5989-27-5
EC No.	227-813-5
Molecular formula	C10H16
Molecular weight	136.23 g/mol
Relevant identified uses	Fragrance and flavour ingredient; industrial solvent; manufacture of substances
Uses advised against	None
Company	Richest Group Ltd.
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SECTION 2: Hazards identification

GHS Classification	Flammable liquids Category 3 / Skin irritation Category 2 / Skin sensitization Category 1 / Aspiration hazard Category 1 / Short-term (acute) aquatic hazard Category 1 / Long-term (chronic) aquatic hazard Category 1
Pictogram(s)	GHS02 (Flame), GHS07 (Exclamation mark), GHS08 (Health hazard), GHS09 (Environment)
Signal word	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.
Precautionary statement(s)	P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P273 Avoid release to the environment. P280 Wear protective gloves/protective clothing/eye protection/face protection. P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor. P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. P331 Do NOT induce vomiting.
Other hazards	None known.

SECTION 3: Composition/information on ingredients

Component	(R)-(+)-Limonene
CAS No.	5989-27-5
EC No.	227-813-5
Classification	Flam. Liq. 3; Skin Irrit. 2; Skin Sens. 1; Asp. Tox. 1; Aquatic Acute 1; Aquatic Chronic 1; H226, H315, H317, H304, H400, H410
Concentration (%)	≤100 %

SECTION 4: First aid measures

If inhaled	After inhalation: fresh air.
In case of skin contact	Take off immediately all contaminated clothing. Rinse skin with water/shower. Consult a physician.
In case of eye contact	Rinse out with plenty of water. Remove contact lenses.
If swallowed	Caution if victim vomits. Risk of aspiration! Keep airways free. Pulmonary failure possible after aspiration of vomit. Call a physician immediately.
Most important symptoms and effects	The most important known symptoms and effects are described in the labelling (see Section 2) and/or in Section 11.
Indication of any immediate medical attention	Treat symptomatically. If swallowed: risk of aspiration into the lungs; seek medical attention immediately.

SECTION 5: Firefighting measures

Suitable extinguishing media	Carbon dioxide (CO2), foam, dry powder.
Unsuitable extinguishing media	For this substance/mixture no limitations of extinguishing agents are given.
Special hazards arising from the	Carbon oxides. Combustible. Vapors are heavier than air and may spread

chemical	along floors. Forms explosive mixtures with air at elevated temperatures. Development of hazardous combustion gases or vapours possible in the event of fire.
Advice for firefighters	Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing. Remove container from danger zone and cool with water. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures	Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert.
Environmental precautions	Do not let product enter drains. Risk of explosion.
Methods and materials for containment and cleaning up	Cover drains. Collect, bind, and pump off spills. Take up carefully with liquid-absorbent material. Dispose of properly. Clean up affected area.

SECTION 7: Handling and storage

Precautions for safe handling	Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge. Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
Conditions for safe storage, including any incompatibilities	Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition. Recommended storage temperature: 2-8 °C.

SECTION 8: Exposure controls/personal protection

Occupational exposure limit values	No occupational exposure limit values established (not listed by ACGIH, DFG or EU).
Biological limit values	None established.
Appropriate engineering controls	Ensure adequate ventilation. Do not let product enter drains.
Eye/face protection	Safety glasses. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).
Skin protection	Wear CE-approved gloves. Full contact: butyl-rubber, minimum layer thickness 0.7 mm, breakthrough time 480 min. Splash contact: latex gloves,
Body protection	Flame retardant antistatic protective clothing.
Respiratory protection	Recommended filter type: Filter A (acc. to DIN 3181) for vapours of organic

	compounds.
Thermal hazards	None known.

SECTION 9: Physical and chemical properties

Physical state	Liquid, clear
Colour	Colorless
Odour	Characteristic, lemon-like
Melting point / freezing point	-73.97 °C
Boiling point or initial boiling point and boiling range	176-177 °C
Flammability	Flammable liquid and vapour.
Lower and upper explosion limit / flammability limit	Lower explosion limit: 0.7 % (V); Upper explosion limit: 6.1 % (V)
Flash point	51 °C - closed cup
Auto-ignition temperature	245 °C at 995.44 hPa
Decomposition temperature	No data available
pH	Not applicable (practically insoluble in water)
Kinematic viscosity	ca. 1.07 mm2/s at 25 °C (dynamic viscosity ca. 0.9 mPa.s at 25 °C)
Solubility	Practically insoluble in water (0.00569 g/L at 20 °C); miscible with ethanol and most non-volatile oils
Partition coefficient n-octanol/water	log Pow: 4.38 at 37 °C
Vapour pressure	2 hPa at 24.85 °C
Density and/or relative density	0.842 g/cm3 at 20 °C
Relative vapour density	4.70 (Air = 1.0)
Particle characteristics	Not applicable (liquid)

SECTION 10: Stability and reactivity

Reactivity	Vapor/air-mixtures are explosive at intense warming.
Chemical stability	Stable under recommended storage conditions.
Possibility of hazardous reactions	Violent reactions possible with: strong oxidizing agents, acids.

Conditions to avoid	Heating.
Incompatible materials	Strong oxidizing agents, acids.
Hazardous decomposition products	In the event of fire: carbon oxides (see Section 5).

SECTION 11: Toxicological information

Acute toxicity - Oral / Inhalation / Dermal	LD50 Oral - Rat - male and female - > 2,000 mg/kg (OECD 423) LD50 Dermal - Rabbit - > 5,000 mg/kg (RTECS)
Skin corrosion/irritation	Skin - Rabbit: Mild skin irritation - 4 h (OECD 404)
Serious eye damage/irritation	Eyes - Rabbit: No eye irritation (OECD 405)
Respiratory or skin sensitization	Local lymph node assay (LLNA) - Mouse: May cause sensitization by skin contact (OECD 429)
Germ cell mutagenicity	In vitro tests (mouse lymphoma, sister chromatid exchange, Ames, chromosome aberration) and comet assay (rat, oral): negative
Carcinogenicity	Not classifiable as to its carcinogenicity based on IARC, ACGIH, NTP, or EPA classification.
Reproductive toxicity	Not classified; no reproductive or developmental toxicity observed in animal studies (ECHA).
STOT - single exposure	Not classified.
STOT - repeated exposure	Not classified.
Aspiration hazard	Aspiration may cause pulmonary edema and pneumonitis.

SECTION 12: Ecological information

Toxicity to fish / daphnia / algae	LC50 - Pimephales promelas (fathead minnow) - 0.72 mg/l - 96 h (OECD 203) EC50 - Daphnia magna (Water flea) - 0.307 mg/l - 48 h (OECD 202) ErC50 - Pseudokirchneriella subcapitata (green algae) - 0.32 mg/l - 72 h (OECD 201)
Persistence and degradability	Readily biodegradable (aerobic, 71.4 % after 28 d, OECD 301B)
Bioaccumulative potential	log Pow 4.38; BCF (estimated) ca. 683 L/kg - potential to bioaccumulate.
Mobility in soil	Estimated log Koc ca. 3.3; expected to adsorb to soil, low mobility.
Other adverse effects	Discharge into the environment must be avoided.

SECTION 13: Disposal considerations

Product disposal methods	Dispose of in accordance with local, regional and national regulations. Do not discharge into drains or the environment.
Contaminated packaging	Empty containers should be disposed of in accordance with applicable regulations; offer for recycling if possible.

SECTION 14: Transport information

UN Number (ADR/RID, IMDG, IATA)	2052
UN Proper Shipping Name	DIPENTENE
Transport hazard class(es)	3
Packing group	III
Environmental hazards (Marine pollutant)	ADR/RID: Yes; IMDG Marine pollutant: Yes; IATA: No
Special precautions for user	None known.

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product	EINECS: Listed (227-813-5) / TSCA: Listed / IECSC: Listed / China Catalog of Hazardous Chemicals 2015: Not listed

SECTION 16: Other information

Full text of H-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. H400 Very toxic to aquatic life. H410 Very toxic to aquatic life with long lasting effects.
Revision date	2026-10-29
Version	1.0

Abbreviations and acronyms: CAS: Chemical Abstracts Service; EC: European Commission; EINECS: European Inventory of Existing Commercial Chemical Substances; ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road; RID: Regulation concerning the International Carriage of Dangerous Goods by Rail; IMDG: International Maritime Dangerous Goods; IATA: International Air Transport Association; TWA: Time Weighted Average; STEL: Short Term Exposure Limit; LD50: Lethal Dose 50%; LC50: Lethal Concentration 50%; EC50: Effective Concentration 50%; PBT: Persistent, Bioaccumulative and Toxic; vPvB: very Persistent and very Bioaccumulative; SDS: Safety Data Sheet.

References: ECHA - European Chemicals Agency, https://echa.europa.eu/; IPCS - International Chemical Safety Cards (ICSC), http://www.ilo.org/; HSDB - Hazardous Substances Data Bank; eChemPortal - OECD Global Portal to Information on Chemical Substances; ERG - Emergency Response Guidebook by U.S. DOT.

Disclaimer: The information in this SDS is only applicable to the specified product and is provided in good faith. It is based on the knowledge available to Richest Group Ltd. at the date of issue and is intended to describe the product for the purposes of health,

safety and environmental requirements only. It does not constitute any guarantee of the properties of the product. Richest Group Ltd. shall not be held liable for any damage resulting from handling or from contact with the above product.