

DIPENTENE (LIMONENE, MIXED ISOMERS)

Date of compilation: 30-07-2026 | Revised: 30-07-2026 | Version: 1

SECTION 1: IDENTIFICATION

1.1 GHS Product identifier:

DIPENTENE (LIMONENE, MIXED ISOMERS)
Synonyms: DL-Limonene; p-Mentha-1,8-diene; Cinene
CAS: 138-86-3

Other means of identification:

Not relevant

1.2 Recommended use of the chemical and restrictions on use:

Relevant uses: Industrial solvent and degreaser, rubber reclaiming agent, fragrance and flavour raw material, paint/resin thinner, cleaning formulations. For industrial user only.
Uses advised against: All uses not specified in this section or in section 7.3.

1.3 Supplier's details:

SURAJ CHEMICALS
No 92, Govindappa Naicken Street, Shiva Complex, Chennai – 600001, Tamil Nadu, India
Tel: +91 - 7092722822, +91 - 9840284032 / +91 - 44 - 25393652, 42130281
Email: sales@surajchemicals.com | Website: www.surajchemicals.com
GST No: 33ACEPV8190L1ZZ

1.4 Emergency phone number:

Emergency Contact No: +91 - 7092722822, +91 - 9840284032

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture:

GHS:
Classification of this product has been carried out in accordance with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Flam. Liq. 3	Flammable liquids, Category 3, H226
Skin Irrit. 2	Skin irritation, Category 2, H315
Skin Sens. 1	Skin sensitisation, Category 1, H317
Asp. Tox. 1	Aspiration hazard, Category 1, H304
Aquatic Chronic 1	Hazardous to the aquatic environment, chronic hazard, Category 1, H410

2.2 GHS label elements, including precautionary statements:

GHS: Danger

Hazard statements:

Flam. Liq. 3: H226 – Flammable liquid and vapour.
Skin Irrit. 2: H315 – Causes skin irritation.
Skin Sens. 1: H317 – May cause an allergic skin reaction.
Asp. Tox. 1: H304 – May be fatal if swallowed and enters airways.
Aquatic Chronic 1: H410 – Very toxic to aquatic life with long lasting effects.

Precautionary statements:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground/bond container and receiving equipment.
P243: Take precautionary measures against static discharge.
P264: Wash contaminated skin 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/eye protection.
P301+P310: IF SWALLOWED: Immediately call a doctor. Do NOT induce vomiting.
P302+P352: IF ON SKIN: Wash with plenty of water.
P331: Do NOT induce vomiting.
P333+P313: If skin irritation or rash occurs, get medical advice/attention.
P370+P378: In case of fire: Use dry sand, dry chemical powder or alcohol-resistant foam to extinguish.
P391: Collect spillage.
P501: Dispose of contents/container in accordance with local regulations on hazardous waste.

2.3 Other hazards which do not result in classification:

May form explosive peroxides on prolonged exposure to air and light. Does not meet the criteria for PBT or vPvB.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances:

Chemical description: Monocyclic monoterpene hydrocarbon – racemic mixture of d- and l-limonene isomers (C10H16)
In accordance with Annex 4.3.3 of the GHS, the product contains:

Identification	Chemical Name / Classification	Concentration
CAS: 138-86-3	Dipentene (Limonene) — Flam. Liq. 3: H226; Skin Irrit. 2: H315; Skin Sens. 1: H317; Asp. Tox. 1: H304; Aquatic Chronic 1: H410 – Danger	≥95%

To obtain more information on the hazards of the substances, consult sections 11, 12 and 16.

3.2 Mixtures:

Non-applicable – single substance product.

SECTION 4: FIRST AID MEASURES

4.1 Description of necessary first-aid measures:

Request medical assistance immediately, showing the SDS of this product.

By inhalation:

Remove the person affected from the area of exposure, provide fresh air and keep at rest. Seek medical advice if discomfort continues.

By skin contact:

Remove contaminated clothing and footwear. Wash skin thoroughly with soap and water. If irritation or an allergic reaction develops, seek medical attention.

By eye contact:

Rinse immediately with plenty of water for at least 15 minutes, holding eyelids open. Remove contact lenses if present and easy to do. Seek medical advice.

By ingestion/aspiration:

Do NOT induce vomiting due to aspiration hazard. Rinse mouth with water. Call a doctor/poison centre immediately.

4.2 Most important symptoms/effects, acute and delayed:

May cause skin irritation and allergic skin reactions on repeated exposure. If aspirated into the lungs may cause chemical pneumonitis. See sections 2 and 11.

4.3 Indication of immediate medical attention and special treatment needed, if necessary:

Due to the aspiration hazard, gastric lavage/emesis induction is contraindicated – treat symptomatically.

SECTION 5: FIRE-FIGHTING MEASURES

5.1 Suitable extinguishing media:

Suitable: Dry chemical powder (ABC), carbon dioxide, alcohol-resistant foam.

Unsuitable: High-pressure water jet (may spread the flammable liquid).

5.2 Specific hazards arising from the chemical:

Flammable liquid; vapour may form explosive mixtures with air. Vapour is heavier than air and may travel along the ground to ignition sources. Combustion produces oxides of carbon.

5.3 Special protective actions for fire-fighters:

Evacuate non-essential personnel. Wear self-contained breathing apparatus and full protective clothing. Cool exposed containers with water spray from a safe distance.

Additional provisions:

Contain fire-fighting water run-off; avoid discharge to drains/watercourses.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures:

For non-emergency personnel:

Eliminate all ignition sources. Ensure adequate ventilation. Use PPE as per section 8. Avoid skin/eye contact.

For emergency responders:

Wear antistatic protective clothing and respiratory protection against vapour. Approach from upwind.

6.2 Environmental precautions:

Very toxic to aquatic life – prevent at all cost any spillage from entering drains, watercourses or soil. Notify the relevant authority in case of significant environmental release.

6.3 Methods and materials for containment and cleaning up:

Contain spillage with inert absorbent material (sand, earth, vermiculite). Collect in suitable labelled containers for disposal. Ventilate the area.

6.4 Reference to other sections:

See sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling:

A. General precautions for safe use:

Keep away from heat, sparks, open flame and other ignition sources. Avoid prolonged exposure to air and light which may form peroxides. Avoid skin and eye contact.

B. Technical recommendations for the prevention of fires and explosions:

Use explosion-proof electrical/ventilating/lighting equipment. Ground and bond containers and transfer equipment to control static electricity.

C. Technical recommendations on general occupational hygiene:

Do not eat, drink or smoke during handling. Wash hands thoroughly after handling.

D. Technical recommendations to prevent environmental risks:

Avoid release to drains and watercourses. Follow the protective measures given in section 8.

7.2 Conditions for safe storage, including any incompatibilities:

A. Specific storage requirements:

Storage Temp.	Below 30°C, away from direct sunlight
Maximum time	12 Months in original closed container

B. General conditions for storage:

Store in a cool, dry, well-ventilated place away from heat, light and strong oxidising agents. Keep container tightly closed to limit peroxide formation and vapour loss.

7.3 Specific end use(s):

Except for the instructions already specified, it is not necessary to provide any special recommendation regarding the uses of this product.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters:

No specific statutory occupational exposure limit has been established for limonene under the Factories Act, 1948, as amended. Commonly referenced industry guidance values:

Identification	Occupational Exposure Limit Type	Value
Dipentene (Limonene) CAS: 138-86-3	Time Weighted average concentration (8 hrs)	Typical value — refer to current specification sheet

8.2 Appropriate engineering controls:

Use local exhaust ventilation to control vapour concentrations below exposure limits, in addition to PPE.

B. Respiratory protection:

Organic vapour filter mask (Type A). Use self-contained equipment in enclosed spaces or where concentrations are high.

C. Specific protection for the hands:

Chemical-resistant gloves (nitrile, ≥0.4 mm). Replace at any sign of damage or degradation.

D. Eye and face protection:

Chemical splash goggles.

E. Bodily protection:

Antistatic protective clothing; safety footwear with antistatic properties.

F. Additional emergency measures:

Emergency shower and eyewash stations should be available.

Environmental exposure controls:

Avoid environmental spillage of both the product and its container. See subsection 7.1.D.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties:

Appearance	
Physical state at 20°C	Liquid
Appearance	Clear, mobile liquid
Color	Colourless to pale yellow
Odor	Citrus / lemon-like
Odour threshold	Not established
Volatility	
Boiling point at atmospheric pressure	175 – 177°C
Vapour pressure at 20°C	~1.9 mmHg
Evaporation rate at 20°C	Typical value — refer to current specification sheet
Product Description	
Density / Relative density at 20°C	0.84 g/cm³
Solubility in water at 20°C	Practically insoluble; miscible with most organic solvents
Partition coefficient n-octanol/water	~4.8 (log Pow)
Melting point/freezing point	–74°C (typical)
Flammability	
Flash Point	48 – 50°C (closed cup)
Flammability (solid, gas)	Not applicable (liquid)
Autoignition temperature	~237°C
Lower / Upper flammability limit	0.7 / 6.1 % v/v (typical)
Particle Characteristics	
Median equivalent diameter	Non-applicable (liquid)

9.2 Other information:

Explosive properties	Not relevant
Oxidising properties	Not relevant
Corrosive to metals	Non-corrosive
Heat of combustion	Typical value — refer to current specification sheet

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity:

May react with strong oxidising agents. Autoxidises slowly on prolonged exposure to air/light, forming peroxides and degradation products such as carvone and limonene oxide.

10.2 Chemical stability:

Chemically stable under the indicated conditions of storage, handling and use when protected from prolonged air/light exposure.

10.3 Possibility of hazardous reactions:

Contact with strong oxidisers may lead to hazardous exothermic reaction/fire.

10.4 Conditions to avoid:

Shock/Friction	Contact with Air	Increase in Temperature	Sunlight	Humidity
Not applicable	Avoid prolonged exposure (peroxide formation)	Danger of ignition above flash point	Avoid prolonged direct exposure	No special measures

10.5 Incompatible materials:

Strong Oxidisers	Strong Acids
Avoid contact – risk of fire	Avoid contact

10.6 Hazardous decomposition products:

Oxides of carbon and peroxidic compounds may form on prolonged air/light exposure.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects:

In case of exposure that is repetitive, prolonged, or at concentrations higher than recommended occupational exposure limits, adverse health effects may result depending on the means of exposure:

A. Ingestion (acute effect):

Low acute oral toxicity; main concern is aspiration into the lungs causing chemical pneumonitis (H304) if vomiting occurs after ingestion.

B. Inhalation (acute effect):

Vapour may cause irritation of the respiratory tract at high concentrations.

C. Contact with skin and eyes (acute effect):

Causes skin irritation (H315); repeated or prolonged contact may cause allergic skin sensitisation (H317). May cause eye irritation.

D. CMR effects (carcinogenicity, mutagenicity, reproductive toxicity):

Classification criteria are not met based on available data. IARC: Not classifiable as a human carcinogen (Group 3).

E. Sensitizing effects:

Classified as Skin Sens. 1 (H317) based on established data; oxidised limonene (peroxides) is the principal sensitising species.

F/G. Specific target organ toxicity (STOT):

Classification criteria are not met based on available data.

H. Aspiration hazard:

Classified as Asp. Tox. 1 (H304) – low viscosity hydrocarbon liquid.

Product-specific toxicological information:

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Identification	Acute Toxicity	Genus
Dipentene (Limonene) CAS: 138-86-3	LD50 oral: ~4400 mg/kg	Rat
	LD50 dermal: >5000 mg/kg	Rabbit

SECTION 12: ECOLOGICAL INFORMATION

Very toxic to aquatic life with long lasting effects.

12.1 Toxicity:

Acute Toxicity	Species	Genus
LC50: 0.4 – 1.0 mg/L (96h), typical value	Typical value — refer to current specification sheet	Fish
EC50: ~0.4 mg/L (48h), typical value	Typical value — refer to current specification sheet	Crustacean

12.2 Persistence and degradability:

Readily biodegradable under aerobic conditions.

12.3 Bioaccumulative potential:

High log Pow indicates potential for bioaccumulation; rapid biodegradation and metabolism limit actual bioaccumulation.

12.4 Mobility in soil:

Koc	Henry	Dry Soil	Moist Soil
High	High (volatile)	Low mobility	Low mobility

12.5 Results of PBT and vPvB assessment:

Does not meet PBT/vPvB criteria based on available data.

12.6 Other adverse effects:

Not described

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Disposal methods:

Dispose of via an authorised hazardous/industrial waste contractor, as a flammable organic liquid waste, in accordance with local regulations. Do not discharge to drains or watercourses. For packaging: avoid treatments as far as possible – use dedicated containers.

Refer to national and local regulations on waste management.

SECTION 14: TRANSPORT INFORMATION

Transport of dangerous goods by land (ADR 2023 / RID 2023):

14.1 UN number	UN2319
14.2 UN proper shipping name	TERPENE HYDROCARBONS, N.O.S. (Dipentene)
14.3 Transport hazard class(es)	3
14.4 Packing group	III
14.5 Environmental hazard	Yes
14.6 Special precautions for user	Physico-chemical properties: see section 9
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

Transport of dangerous goods by sea (IMDG 41-22):

14.1 UN number	UN2319
14.2 UN proper shipping name	TERPENE HYDROCARBONS, N.O.S. (Dipentene)
14.3 Transport hazard class(es)	3
14.4 Packing group	III
14.5 Marine pollutant	Yes
14.6 Special precautions for user	EmS Codes: F-E, S-E
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

Transport of dangerous goods by air (IATA/ICAO 2024):

14.1 UN number	UN2319
14.2 UN proper shipping name	TERPENE HYDROCARBONS, N.O.S. (Dipentene)
14.3 Transport hazard class(es)	3
14.4 Packing group	III
14.5 Environmental hazard	Yes
14.6 Special precautions for user	Physico-chemical properties: see section 9
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental regulations specific for the product in question:

It is recommended to use the information included in this safety data sheet as data used in a risk evaluation of local circumstances, in order to establish the necessary risk prevention measures for the manipulation, use, storage and disposal of this product.

Other legislation:

Manufacture, Storage and Import of Hazardous Chemicals Rules 1989
The Factories Act, 1948 (Act No. 63 of 1948), as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987)
The Chemical Accidents (Emergency Planning, Preparedness, and Response) Rules, 1996
Petroleum Rules, 2002 (as applicable to flammable liquid storage)

SECTION 16: OTHER INFORMATION

Legislation related to safety data sheets:

This safety data sheet has been designed in accordance with Annex 4 – Guidance on the preparation of Safety Data Sheets of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Texts of the legislative phrases mentioned in sections 2 and 3:

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.

The phrases indicated do not refer to the product itself; they are present merely for informative purposes and refer to the individual components which appear in section 3.

Advice related to training:

Minimal training is recommended to prevent industrial risks for staff using this product, in order to facilitate their comprehension and interpretation of this safety data sheet, as well as the label on the product.

Principal bibliographical sources:

The United Nations Economic Commission for Europe (UNECE); publicly available GHS classification and physical-constant references for CAS 138-86-3.

Abbreviations and acronyms:

ADR: European agreement concerning the international carriage of dangerous goods by road | IMDG: International maritime dangerous goods code | IATA: International Air Transport Association | ICAO: International Civil Aviation Organisation | LD50: Lethal Dose 50 | LC50: Lethal Concentration 50 | EC50: Effective Concentration 50 | Log-POW: Octanol-water partition coefficient | Koc: Partition coefficient of organic carbon | IARC: International Agency for Research on Cancer

The information contained in this safety data sheet is based on sources, technical knowledge and current legislation, without being able to guarantee its accuracy. This information cannot be considered a guarantee of the properties of the product; it is simply a description of the security requirements. The occupational methodology and conditions for users of this product are not within Suraj Chemicals' awareness or control, and it is ultimately the responsibility of the user to take the necessary measures to obtain the legal requirements concerning the manipulation, storage, use and disposal of chemical products. The information on this safety data sheet only refers to this product, which should not be used for needs other than those specified.

END OF SAFETY DATA SHEET