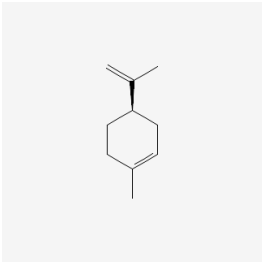
Technical Data Sheet

D-Limonene Technical Grade

Technical Grade · 95%

Alliance Code	Revised	Revision
d-limonene-technical-grade	2026-10-08	1.6

CAS number 5989-27-5	UN number UN2319	Hazard class · packing group 3 · PG III
 Structure · PubChem	Grade Technical Grade · 95%	Signal word **Danger**
Hazards Flammable · Irritant / harmful · Health hazard · Environmental hazard · H226 H304 H315 H317 H410		
Proper shipping name Terpene hydrocarbons, N.O.S.		

IDENTITY & COMPOSITION

PRODUCT NAME
D-Limonene Technical Grade

ALLIANCE CODE
d-limonene-technical-grade

GRADE
Technical Grade

CONCENTRATION
95%

CAS NUMBER
5989-27-5 PubChem

FORMULA
C10H16 PubChem

MOLECULAR WEIGHT
136.23 PubChem

PRODUCT TYPE
Pure substance

SPECIFICATIONS

TEST	SPECIFICATION	TYPICAL	METHOD	SOURCE
D-Limonene (assay)	93 Minimum	—	GC	Interpreted
D-Limonene GC	94 Minimum	—	GC	Interpreted
Optical rotation @ 25 °C	+95.55 - +104	—	—	Interpreted
Evaporation residue	1.0 % Max	—	—	Interpreted
Colour (Gardner)	1.0 Max	—	ASTM D1544 / Gardner comparator	Interpreted
Flash point, closed cup	43 °C (110 °F) Min	—	ASTM D56 (Tag closed cup)	Interpreted

Values are reproduced from the current product reference. Source labels do not by themselves establish a supplier guarantee or a test result for your lot. Confirm applicable acceptance limits and request lot-specific documentation.

AVAILABLE GRADES SAME CAS, ALTERNATE GRADES AND CONCENTRATIONS

GRADE	CONCENTRATION	TYPICAL ASSAY	SKU
THIS GRADE Technical Grade	95%	—	current
Food	94%	—	d-limonene-usp-grade

Typical assay for each grade is the average of its recent lots. Confirm a grade meets your specification before substituting it.

PHYSICAL & CHEMICAL PROPERTIES

PROPERTY	VALUE	SOURCE
Appearance	Clear, Colorless to Slightly Yellow	Interpreted
Form	Liquid	Published reference
Odor	Citrus (orange) odor	Adjudicated
Specific Gravity	0.84 at 20–25 °C (water = 1)	Adjudicated
Density	0.8411 g/cm^3 at 68 °F (NTP, 1992)	Published reference
Boiling Point	175–176 °C (347–349 °F)	Adjudicated
Melting Point	-96 °C (-141 °F); thickens near -74 to -78 °C	Adjudicated
Flash Point	43–48 °C (110–118 °F), closed cup	Adjudicated
Vapor Pressure	< 2 mmHg at 20 °C	Adjudicated
Vapor Density	4.7 (air = 1)	Adjudicated
Solubility (water)	Practically insoluble in water	Adjudicated
Refractive Index (nD 20)	1.461 - 1.481	Interpreted

REGULATORY & TRANSPORT

DOT / 49 CFR

UN NUMBER

UN2319 Adjudicated

HAZARD CLASS

3 Adjudicated

PACKING GROUP

III Adjudicated

PROPER SHIPPING NAME

Terpene hydrocarbons, N.O.S. Adjudicated

GHS / OSHA HCS 2024

SIGNAL WORD

Danger Adjudicated

H-CODES (HAZARD STATEMENTS)

H226, H304, H315, H317, H410 Adjudicated

P-CODES (PRECAUTIONARY STATEMENTS)

P210, P233, P240, P241, P242, P243, P261, P264, P272, P273, P280, P301+P310, P302+P352, P303+P361+P353, P321, P331, P332+P313, P333+P313, P362, P370+P378, P391, P403+P235, P405, P501

Adjudicated

OCCUPATIONAL EXPOSURE LIMITS

OSHA PEL (29 CFR 1910.1000)

— no canonical

ACGIH TLV

— no canonical

NIOSH REL

— no canonical

NIOSH IDLH

— no canonical

Transport descriptions reflect 49 CFR 172.101 lookup at time of publication. Sourced data: NIOSH Pocket Guide for REL/IDLH, OSHA Z-Tables for PEL. Always verify against the latest regulatory text before shipment-critical decisions.

HEALTH & FIRE HAZARD

ACUTE TOXICOLOGY

LD_{50} ORAL (RAT)

4,400–5,200 mg/kg

Adjudicated

LD_{50} DERMAL (RABBIT)

> 5,000 mg/kg Adjudicated

Acute toxicology values from SDS Section 11 or NIOSH RTECS.

APPLICATIONS

Most often used in the manufacture of bio-based cleaning compounds and as a fragrance additive

florachem.com

Chosen over other solvents for its solvency, biodegradability and derivation from renewable resources

florachem.com

Used as a solvent and defoaming agent, and to enhance the quality of drilling muds and help dissolve additives

parchem.com

Industrial solvent use: degreasing metals prior to industrial painting, in paints, and for cleaning in the electronics and printing industries

wintersunchem.com

Used in the manufacturing of resins, as a wetting and dispersing agent, and in insect control

wintersunchem.com

Applications are drawn from published manufacturer and supplier documentation; each is sourced. Suitability for a specific use is the buyer's to confirm.

STORAGE & HANDLING

RECOMMENDED STORAGE

Keep tightly closed with minimal headspace, cool and out of light, away from oxidizers. Old or oxidized material is a stronger sensitizer.

Adjudicated

HANDLING PRECAUTIONS

Use standard chemical PPE — splash goggles, gloves, lab coat. Refer to SDS for hazard-specific PPE requirements.

Class-level guidance — not product-specific; the SDS controls.

INCOMPATIBILITIES

Strong oxidizing agents and peroxides; strong acids; halogens and iodine pentafluoride (violent reaction).

Adjudicated

SHELF LIFE

24 months florachem.com

In original, unopened drums stored in a cool, ventilated, fire resistant building; quality to be re-certified after 24 months from date of manufacture

For full hazard, PPE, and emergency response guidance, refer to the Safety Data Sheet (SDS) for this product. The SDS controls in all cases where guidance differs.

PACKAGING & LOGISTICS

SHIPPING DESCRIPTION (US DOT)

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UN2319, Terpene hydrocarbons, N.O.S., 3, PG III
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Packaging-dependent regulation: Non-bulk packaging (≤ 119 gal, e.g. drums, pails, cans) ships as NON-REGULATED under the combustible-liquid reclassification (49 CFR 173.150(f)). Bulk packaging (totes/IBC > 119 gal) ships fully regulated under the DOT profile shown above. The combustible-liquid reclassification does not apply to transportation by vessel or aircraft, except where other means of transportation is impracticable (49 CFR 173.120(b)(2)).

Sourced from 49 CFR 172.101. Confirm against shipping documents and carrier requirements before tender.

NMFC CLASS	PLACARD (BULK ONLY)	PACKING GROUP
77.5	Flammable Liquid	PG III

REVISION HISTORY

Last reviewed 2026-10-08 by Andre Taki, Chief Commercial Officer, DOT Hazmat–certified (49 CFR 172.704).

VERSION	DATE	CHANGE	TRIGGER
1.6	2026-10-08	Canonical data updated: 3 fields changed via the provenance/adjudication pipeline. • ghsClassification · canonical change (coa.data_provenance / adjudication) • hazard_h_codes · canonical change (coa.data_provenance / adjudication) • hazard_p_codes · canonical change (coa.data_provenance / adjudication)	canonical_change
1.5	2026-10-07	Canonical data updated: 22 fields changed via the provenance/adjudication pipeline. • ghsClassification · canonical change (coa.data_provenance / adjudication) • hazard_h_codes · canonical change (coa.data_provenance / adjudication) • hazard_p_codes · canonical change (coa.data_provenance / adjudication) • synonyms · canonical change (coa.data_provenance / adjudication) • recommended_use · canonical change (coa.data_provenance / adjudication) • restrictions_on_use · canonical change (coa.data_provenance / adjudication) • odor · canonical change (coa.data_provenance / adjudication) • flashPoint · canonical change (coa.data_provenance / adjudication) • boilingPoint · canonical change (coa.data_provenance / adjudication) • meltingPoint · canonical change (coa.data_provenance / adjudication) • vaporPressure · canonical change (coa.data_provenance / adjudication) • vaporDensity · canonical change (coa.data_provenance / adjudication) • specificGravity · canonical change (coa.data_provenance / adjudication) • solubility · canonical change (coa.data_provenance / adjudication) • evaporationRate · canonical change (coa.data_provenance / adjudication) • explosiveLimits · canonical change (coa.data_provenance / adjudication) • oel_other · canonical change (coa.data_provenance / adjudication) • incompatible_materials · canonical change (coa.data_provenance / adjudication) • conditions_to_avoid · canonical change (coa.data_provenance / adjudication) • hazardous_decomposition_products · canonical change (coa.data_provenance / adjudication) • storage_precautions · canonical change (coa.data_provenance / adjudication) • rcra_waste_codes · canonical change (coa.data_provenance / adjudication)	canonical_change
1.4	2026-09-30	Canonical data updated: 3 fields changed via the provenance/adjudication pipeline. • boilingPoint · canonical change (coa.data_provenance / adjudication) • meltingPoint · canonical change (coa.data_provenance / adjudication) • flashPoint · canonical change (coa.data_provenance / adjudication)	canonical_change

VERSION	DATE	CHANGE	TRIGGER
1.3	2026-07-22	Canonical data updated: 1 field changed via the provenance/adjudication pipeline. • unNumber · canonical change (coa.data_provenance / adjudication)	canonical_change
1.2	2026-07-21	Canonical data updated: 1 field changed via the provenance/adjudication pipeline. • ghsClassification · canonical change (coa.data_provenance / adjudication)	canonical_change
1.1	2026-06-24	Canonical data re-verified: 13 fields updated against independent vendor SDSs, CLP Annex VI, 49 CFR, and OSHA HazCom 2024 (GHS classification, hazard/precautionary codes, signal word, physical properties as applicable). • bulkThresholdGallons · canonical adjudication / reground (coa.data_provenance) • countryOfOrigin · canonical adjudication / reground (coa.data_provenance) • dotProperShippingName · canonical adjudication / reground (coa.data_provenance) • dotSubsidiaryHazardClass · canonical adjudication / reground (coa.data_provenance) • ghsClassification · canonical adjudication / reground (coa.data_provenance) • hazardClass · canonical adjudication / reground (coa.data_provenance) • hazard_h_codes · canonical adjudication / reground (coa.data_provenance) • hazard_p_codes · canonical adjudication / reground (coa.data_provenance) • hsCode · canonical adjudication / reground (coa.data_provenance) • packingGroup · canonical adjudication / reground (coa.data_provenance) • regulationRule · canonical adjudication / reground (coa.data_provenance) • signalWord · canonical adjudication / reground (coa.data_provenance) • unNumber · canonical adjudication / reground (coa.data_provenance)	canonical_change
1.0	2026-05-20	Initial URL-first TDS published from canonical chemistry registry.	initial

This Technical Data Sheet is provided for technical reference. The Safety Data Sheet (SDS) controls in all cases where guidance differs. Values reflect Alliance Chemical canonical data at time of generation; subsequent revisions are recorded in the Revision History above.