

Technical Data Sheet (TDS)

- Cardamom Oil

Product Name: Cardamom Oil **English Name:** Cardamom Oil **CAS Number:** 8000-66-6 **MDL Number:** MFCD00147994 **Main Component:** 1,8-Cineole (C₁₀ H₁₈ O, CAS 470-82-6, ≥35%) **Molecular Weight:** Variable (natural essential oil mixture) **Revision Date:** 24 FEB 2026

1. Product Overview

Cardamom Oil (CAS 8000-66-6) is a premium natural essential oil extracted from the dried seeds of *Elettaria cardamomum* (green cardamom) by steam distillation, with 1,8-Cineole as the core active component (≥35%). It features a fresh, spicy-sweet aromatic scent with subtle citrus and herbal notes, and has excellent fragrance retention, thermal stability and natural flavoring properties. This product is manufactured in accordance with international essential oil industrial standards, with high purity, stable physical and chemical properties, and compliant with GB 2760, EU Cosmetics Regulation, IFRA and FDA standards. As a classic spicy aromatic essential oil, it is widely used in fragrance & flavor, food, cosmetics, oral care and pharmaceutical industries, with high application value and safety when used as directed.

Core Characteristics: High 1,8-Cineole content (≥41.5%); natural plant-sourced (steam-distilled, no solvent residues); fresh spicy-sweet aroma with citrus notes; excellent thermal stability (≤120°C); good solubility in organic solvents; compliant with food/cosmetic/oral care safety standards; 24-month long shelf life.

2. Technical Specifications (Complies with Industrial Standard)

Item	Specification
Appearance	Colorless to pale yellow clear mobile liquid
1,8-Cineole Content	≥ 35.0% (GC), typical 41.5%
Refractive Index (20°C)	1.4600-1.4700
Relative Density (20/20°C)	0.910-0.930
Optical Rotation (20°C)	+15.0° to +40.0°
Acid Value	≤ 2.0 mg KOH/g
Water Content	≤ 0.5% (Karl Fischer)
Heavy Metals (Pb)	≤ 5 ppm
Heavy Metals (As)	≤ 1 ppm
Solubility (70% Ethanol, 25°C)	1:3 soluble
Solubility in Water	<0.2g/100mL (25°C)
Viscosity (25°C)	8-15 mPa s
Flash Point	≥ 70°C (Closed Cup)
Odor	Fresh spicy-sweet cardamom aroma with citrus notes (no off-odor)
Microbiological Index	Total bacterial count ≤ 100 CFU/mL, E. coli negative
Temperature Stability	Stable at 0-40°C (aroma retention ≥95%)
Fragrance Retention	≥ 90% after 6 months of storage (under specified conditions)

3. Product Advantages

- Natural & Pure:** Steam-distilled from high-quality green cardamom seeds, no artificial additives, synthetic fragrances or solvent residues; meets organic product standards for organic grade.
- Pleasant & Versatile Aroma:** Unique fresh spicy-sweet scent with citrus and herbal notes, compatible with various fragrance systems (spicy, floral, citrus, woody); ideal for both fragrance and flavor formulations.
- Excellent Thermal Stability:** Resistant to high temperature (≤120°C) during processing, no fragrance loss or active component degradation; suitable for high-temperature production processes (baking, candy making, beverage processing).
- Good Compatibility:** Soluble in most organic solvents (ethanol, propylene glycol, vegetable oil) and common fragrance/flavor/cosmetic raw materials; easy to compound with no adverse reactions.



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- Multi-Functional:** Integrates fragrance, flavoring, mild antibacterial and refreshing properties; applicable to food, cosmetics, oral care, pharmaceuticals and aromatherapy, one material for multiple uses.
- Safe & Compliant:** Complies with global food, cosmetic and oral care safety standards; non-toxic, non-sensitizing with normal diluted use; low irritation risk.

4. Application Fields

- Fragrance Formulation:** Perfume, eau de toilette, soap, candle, air freshener, laundry detergent (formulation ratio 0.3-5.0%); core raw material for spicy, floral, citrus and oriental fragrance systems; enhances the fresh and spicy notes of finished products.
- Food Flavor:** Bakery, candy, beverage, liquor, dairy products, condiment (compliant with GB 2760, formulation ratio 0.001-0.2%); enhances sweet and spicy flavor, typical for cardamom-flavored foods and beverages (e.g., Indian curry, Nordic pastries, spice tea).

5. Usage Methods & Dosage

5.1 General Usage Principles

- Dilution Required:** No undiluted direct skin/eye/oral contact; dilute with organic solvent (ethanol/propylene glycol/vegetable oil) before use (dilution ratio 1:10 to 1:50 according to application scenario).
- Avoid High Temperature:** Heating temperature during processing $\leq 120^{\circ}\text{C}$ to avoid fragrance loss and active component degradation; add at the final stage of high-temperature processing (e.g., baking) if possible.
- Sealed Use:** Prepare formulated products on site; avoid long-term exposure to air to prevent oxidation and aroma loss.
- Compatibility Test:** Conduct a small-scale compatibility test before large-scale use with other raw materials (especially for acidic/alkaline formulations with $\text{pH} < 5$ or $\text{pH} > 8$).

5.2 Recommended Dosage (Diluted Formulation Ratio)

Industry	Application Scenario	Recommended Dosage
Fragrance	Perfume/soap/candle/air freshener	0.3-5.0%
Food Flavor	Bakery/candy/liquor/condiment	0.001-0.2% (GB 2760 compliant)
Cosmetics	Skin care/hair care/body wash	0.1-2.0%
Oral Care	Toothpaste/mouthwash	0.05-1.0%
Pharmaceuticals	Digestive drug/respiratory drug excipient	0.01-0.5%
Aromatherapy	Diffuser oil/massage oil	0.5-2.0%
Household Products	Deodorant/fabric softener	0.1-3.0%
Feed Additive	Livestock/poultry feed	0.005-0.02%

6. Packaging & Storage

- Food/Cosmetic/Oral Care Grade:** 100mL/500mL/1L brown glass bottles (sealed with teflon stopper); 5L/10L light-proof HDPE plastic drums (food-grade inner lining).
- Industrial/Pharmaceutical Grade:** 25L/50L light-proof HDPE plastic drums; 200L iron drums with inner plastic lining (nitrogen-filled for bulk storage to prevent oxidation).
- Sample Package:** 10mL/30mL brown glass vials (for formulation testing and trial use; sealed with crimp cap).
- Custom Packaging:** Small/bulk package, nitrogen-filled packaging, organic grade packaging available upon customer request.

7. Safety & Protection

- The product is a Class 3 flammable liquid; causes mild skin irritation and serious eye irritation; harmful to aquatic life with acute and long-term effects.
- Wear **nitrile rubber gloves ($\geq 0.11\text{mm}$)**, **chemical safety goggles** and **organic vapor cartridge respirator** during handling; avoid latex gloves and undiluted direct contact with skin/eyes.
- Operate in a well-ventilated area; keep away from heat, sparks and open flames; prohibit smoking in the operation area; use explosion-proof electrical equipment for large-scale operation.