

Technical Data Sheet (TDS)

- L-Menthol, Natural 天然 L - 薄荷醇

Revision Date: 28 FEB 2026

1. Product Overview

- **Product Name:** L-Menthol, Natural (天然 L - 薄荷醇)
 - **English Name:** Natural L-Menthol; (1R,2S,5R)-2-Isopropyl-5-methylcyclohexanol
 - **CAS Number:** 2216-51-5
 - **Molecular Formula:** C₁₀ H₂₀ O
 - **Molecular Weight:** 156.27 g/mol
 - **Form:** Colorless to white crystalline solid/needles with a characteristic fresh mint odor and cool taste
 - **Grade:** Food Grade / Cosmetic Grade / Pharmaceutical Grade / Industrial Grade
- Natural L-Menthol is a high-purity monoterpene alcohol extracted and refined from natural *Mentha haplocalyx* Briq or *Mentha piperita* L. It is a classic natural cooling agent with a pure mint aroma and obvious cool sensory effect on the skin and mucous membranes. The product has stable physical and chemical properties, good solubility in organic solvents, and complies with EU REACH, US FDA, Chinese National Standards (GB) and Pharmacopoeia requirements. It is non-toxic, low-irritating, and widely used in food, cosmetics, pharmaceuticals, oral care, daily chemicals and other fields, with cooling, flavoring, fragrance fixing and anti-pruritic effects.

2. Technical Specifications (Complies with Food/Cosmetic/Pharm/Industrial Standard)

Item	Specification
Appearance	Colorless-white crystalline needles, characteristic mint odor, no foreign impurity
Assay (L-Menthol)	≥ 99.0%
Specific Rotation [α] ₂₀ ^D	- 45.0 ~ -50.0°
Melting Point	41 ~ 44°C
Loss on Drying (105°C, 2h)	≤ 0.5%
Residue on Ignition	≤ 0.05%
Residual Solvent (Ethanol)	≤ 0.5%
Heavy Metals (Pb)	≤ 5 ppm
Heavy Metals (As)	≤ 1 ppm
Total Bacterial Count	≤ 100 CFU/g
E. coli	Negative
Solubility (95% Ethanol, 25°C)	1 g in 0.2 mL, clear
Solubility (Propylene Glycol, 25°C)	1 g in 1.5 mL, clear
Temperature Stability	Stable at 0 ~ 30°C (purity retention ≥ 99%); melts at ≥41°C, no degradation after solidification
Storage Stability	24 months unopened (under specified conditions), no discoloration or odor change

3. Product Advantages

1. **100% Natural Extraction:** Derived from natural mint plants, no synthetic additives, in line with natural product consumption trends.
2. **High Purity & Pure Aroma:** Assay ≥99.0%, no off-flavor, pure and fresh mint fragrance, excellent flavoring/fragrance fixing effect.
3. **Strong Cooling Effect:** Rapid and long-lasting cool sensory effect on skin and mucous membranes, no irritating aftertaste.
4. **Multi-grade Customization:** Food/cosmetic/pharmaceutical/industrial grade available, meeting different industry quality and safety requirements.



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5. **Good Compatibility:** Soluble in most organic solvents (ethanol, propylene glycol, vegetable oil), compatible with various formulation systems.
6. **Stable Performance:** No easy oxidation or decomposition under normal storage conditions, low water absorption, easy to store and process.

4. Application Fields

- **Food & Beverage Industry:** Flavoring and cooling agent for candy, chewing gum, ice cream, beverage, dairy products, baked goods; mint flavor enhancer for condiments.
- **Cosmetic Industry:** Skin care products (toner, lotion, sunscreen) - cooling, anti-pruritic, refreshing; hair care products (shampoo, hair spray) - fresh fragrance; personal care products (body wash, hand sanitizer) - sensory improvement.
- **Pharmaceutical Industry:** Raw material for cooling and relieving drugs (cold medicine, throat lozenge, antipruritic ointment); excipient for oral and topical preparations with flavoring effect.
- **Oral Care Industry:** Toothpaste, mouthwash, dental floss - fresh breath, cooling oral cavity, antibacterial auxiliary effect.
- **Daily Chemical Industry:** Air freshener, candle, perfume - mint fragrance fixing; industrial cooling agent for plastic, rubber and textile products.
- **Other Fields:** Tobacco flavoring (cigarette, e-cigarette liquid); feed additive (mint flavor for pet feed).

5. Usage Methods

Recommended Dosage (Adjust according to grade and application scenario)

- **Food & Beverage:** 0.05 ~ 0.5% of total formulation (beverage/dairy); 0.1 ~ 1.0% (candy/chewing gum); 0.02 ~ 0.2% (baked goods).
- **Cosmetic:** 0.1 ~ 2.0% of total formulation (skin care/hair care); 0.5 ~ 3.0% (personal care).
- **Pharmaceutical:** 0.5 ~ 5.0% (topical ointment/antipruritic agent); follow pharmacopoeia (oral preparations).
- **Oral Care:** 0.2 ~ 1.0% (toothpaste); 0.1 ~ 0.5% (mouthwash).
- **Industrial/Daily Chemical:** 0.5 ~ 5.0% (air freshener/perfume); 0.1 ~ 2.0% (tobacco/e-cigarette liquid).

Key Application Tips

1. **Dissolution & Addition:** Melt the crystalline solid at 45 ~ 50°C (water bath) and mix with organic solvent (ethanol/propylene glycol) first, then add to the formulation system; can also be ground into fine powder and added to solid formulations (candy/powder).
2. **Temperature Control:** Avoid heating above 60°C for a long time during formulation to prevent volatilization of menthol and loss of cooling/aroma effect.
3. **Compatibility Note:** Stable in neutral/weak acidic systems (pH 5.0 ~ 7.0); avoid strong alkaline (pH > 9.0) environments to prevent slight hydrolysis.

6. Packaging & Storage

Packaging Specifications (Sealed Food/Cosmetic/Pharm Grade Packaging)

- 1 kg/5 kg sealed HDPE plastic jar (inner) + carton (outer) (laboratory/R&D/small-batch use)
- 25 kg sealed food/pharm grade aluminum foil bag (inner) + PP woven bag (outer) (industrial/food bulk use)
- 50 kg sealed stainless steel drum (cosmetic/pharmaceutical large-scale use)
- Custom packaging available (e.g., 100g/500g small jar for cosmetic formulation).

7. Safety & Protection

1. The product is non-toxic, low-irritating; direct skin contact has a cooling effect, no adverse reactions for most people; a small number of sensitive individuals may have mild skin/eye irritation.
2. **Recommended PPE:** Nitrile rubber gloves and safety glasses for large-scale handling (melting/grinding) to avoid crystal splashing into eyes and skin; a dust mask is optional for fine powder operation (to prevent inhalation of mint powder causing mild respiratory discomfort).
3. **Accident Treatment:**
 - Skin Contact: No special treatment needed; rinse with water if powder/crystals adhere to the skin, and wipe dry with a clean cloth.