

## Technical Data Sheet (TDS)

### 1. Product Overview

**Product Name:** Panthenol **CAS Number:** 81-13-0 **Molecular Formula:** C<sub>9</sub> H<sub>19</sub> NO<sub>4</sub> **Molecular Weight:** 205.25 g/mol **Product Characteristics:** Also known as provitamin B5, a water-soluble viscous liquid derivative of pantothenic acid (vitamin B5). It is a clear colorless to pale yellow viscous liquid, odorless or with a slight mild odor, miscible with water, ethanol and propylene glycol, slightly soluble in vegetable oil. It has excellent skin and hair penetration ability, and is converted into active pantothenic acid in the body to exert biological effects, with moisturizing, repairing, anti-inflammatory and anti-aging properties. Non-toxic, non-irritating, mild in property, and widely used in cosmetic, pharmaceutical, personal care and feed industries.

### 2. Technical Specifications

**Appearance:** Clear colorless to pale yellow viscous liquid **Assay (HPLC):** ≥ 98.0% **Refractive Index (20°C):** 1.495-1.505 **Specific Gravity (20/20°C):** 1.200-1.220 **Water Content:** ≤ 1.0% (Karl Fischer) **pH Value (5% aqueous solution, 25°C):** 6.0-7.5 **Heavy Metals (Pb):** ≤ 5 ppm **Arsenic (As):** ≤ 1 ppm **Iron (Fe):** ≤ 10 ppm **Residue on Evaporation:** ≤ 0.1% **Optical Rotation (20°C):** +25° to +30° **Solubility:** Miscible with water/ethanol/propylene glycol; slightly soluble in vegetable oil; insoluble in chloroform/ether **Storage Stability:** 36 months at room temperature (sealed, dark); 48 months at 2-8°C (sealed) **Hygroscopy:** Hygroscopic **Viscosity (25°C):** 400-600 mPa·s

### 3. Product Advantages

- 1. High Bioavailability:** Converted into active pantothenic acid in skin, hair and the human body, directly participating in the synthesis of coenzyme A, and exerting efficient nutritional and repairing effects.
- 2. Excellent Penetrability:** Can quickly penetrate the stratum corneum of the skin and the cuticle of the hair, act on the deep layer, and achieve long-lasting moisturizing and repairing effects.
- 3. Mild & Safe:** Non-toxic, non-irritating, non-sensitizing, suitable for all skin and hair types including sensitive skin, and meets cosmetic and pharmaceutical grade safety standards.
- 4. Multi-Effect Synergy:** Integrates moisturizing, repairing, anti-inflammatory, anti-aging and hair care effects, and has good compatibility with other cosmetic raw materials to achieve synergistic effects.
- 5. Stable Performance:** Good stability under normal storage and processing conditions, no easy oxidation and decomposition, and can maintain activity for a long time in cosmetic formulations.

### 4. Application Fields

- **Cosmetic & Personal Care Industry:** Core raw material for skin care products (toner, serum, cream, mask), hair care products (shampoo, conditioner, hair mask), body care products and baby care products; used as moisturizer, repair agent, anti-inflammatory agent and hair conditioner.
- **Pharmaceutical Industry:** Raw material for topical pharmaceutical preparations (ointment, lotion, spray) for the treatment of skin ulcers, burns, eczema and dermatitis; oral nutritional supplement for vitamin B5 deficiency.
- **Feed Industry:** Nutritional fortifier for livestock, poultry and aquatic feed; improves animal skin/mucous membrane health, growth performance and product quality.
- **Other Fields:** Additive for daily chemical products such as hand sanitizer and shower gel, improving the moisturizing and mildness of the product.

### 5. Usage Methods



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- **Cosmetic Formulation:** Add directly to the cosmetic system at room temperature or below 50°C, stir evenly; recommended addition amount: skin care products 0.5-5.0%, hair care products 1.0-8.0%, baby care products 0.2-2.0%.
- **Pharmaceutical Formulation:** Mix with pharmaceutical excipients to prepare topical ointments/lotions or oral preparations; the dosage is determined by clinical needs, and the topical concentration is generally 1.0-10.0%.
- **Feed Additive:** Mix evenly with feed raw materials; recommended addition amount: livestock and poultry 0.01-0.1%, aquatic products 0.02-0.2%. **Note:** Avoid high temperature processing (>80°C) to prevent activity loss; seal immediately after use to prevent moisture absorption and contamination; avoid mixing with strong oxidizing agents and strong acids.

## 6. Packaging & Storage

### Packaging Specifications:

- 1 kg/bottle (food-grade PET bottle with inner seal)
- 5 kg/drum (HDPE drum with inner seal)
- 25 kg/drum (HDPE drum with inner seal)
- Custom small-volume packaging available for R&D and trial production

### Storage Conditions:

- Store in a cool, dry, well-ventilated warehouse, temperature  $\leq 25^{\circ}\text{C}$ , relative humidity  $\leq 60\%$ ;
- Keep the container tightly sealed, avoid direct sunlight, high temperature and moisture absorption;
- Store separately from strong oxidizing agents, strong acids, alkalis and toxic/harmful substances; avoid contact with metal ions for a long time.

**Shelf Life:** 36 months (unopened, room temperature, dark storage); 48 months (unopened, 2-8°C storage); 6 months after opening (sealed, dark storage at room temperature). **Transportation:** Non-hazardous goods, transported by ordinary dry means; avoid collision, direct sunlight, high temperature and rain during transportation to prevent packaging damage and liquid leakage.

## 7. Safety & Protection

The product is cosmetic and pharmaceutical grade safe, non-toxic, non-irritating and non-sensitizing, and no special protective measures are required for routine handling. For large-scale handling, wear nitrile rubber gloves and protective goggles to avoid direct contact with eyes; in case of skin contact, rinse with plenty of water; in case of eye contact, rinse with running water for 5-10 minutes; accidental ingestion has no toxic effects, and rinse mouth with water if necessary.

## 8. Quality Assurance

The product is produced in accordance with ISO 9001 quality management system, ISO 22716 cosmetic GMP and pharmaceutical GMP standards; each batch of products is fully tested by an independent QA laboratory and accompanied by a Certificate of Analysis to ensure compliance with international and national standards (USP/EP/FCC); professional technical support is provided for product application, including formulation optimization, dosage adjustment and compatibility test advice.