Technical Data Sheet (TDS)

- L-Proline

Product Name: L-Proline**English Name**: L-Proline**CAS Number**: 147-85-3**EINECS Number**: 205-702-2**Molecular Formula**: $C_5H_9NO_2$**Molecular Weight**: 115.13 g/mol**Revision Date**: 29 FEB 2026

1. Product Overview

SIGALD L-Proline is a high-purity, food/feed/pharm/cosmetic grade amino acid produced by **advanced microbial fermentation** (non-GMO strain) and multi-step purification (filtration, crystallization, vacuum drying). It is the biologically active L-isomer of proline, a non-essential amino acid for humans/animals (conditionally essential under stress, injury, or rapid growth) and a cyclic amino acid with unique structural characteristics.

Our L-Proline features high purity (≥99.0%), low heavy metal/microbial counts, excellent free-flowing properties, high water solubility and processing stability. It is a critical nutritional fortifier for protein synthesis, collagen formation and connective tissue development; it also acts as a natural moisturizer in cosmetics (enhances skin hydration and elasticity) and a key component in cell culture media (osmoprotectant for cells). Compliant with FDA GRAS, EU and Chinese national standards, it is suitable for a wide range of food, feed, pharmaceutical, cosmetic and biotech applications.

Core Characteristics & Advantages:

- **100% Bioavailable**: Natural L-isomer, direct utilization by human/animal metabolism with no conversion required.
- **High Purity**: ≥99.0% assay, ultra-low heavy metals/ash/microbes, meets multi-grade quality requirements.

2. Technical Specifications (Complies with FCC & Chinese Pharmacopoeia)

Parameter	Specification (Multi-Grade)	Typical Result	Test Method
Appearance	White to off-white crystalline free-flowing powder	White crystalline powder	Visual Inspection
Odor/Taste	Odorless/faint characteristic odor, mild sweet taste	Odorless, mild sweet	Sensory Evaluation
Assay (L-Proline)	≥99.0%	99.7%	HPLC
Specific Rotation (20℃,5% in H_2O)	-84.0° ~ -88.0°	-86.2°	Polarimeter
pH Value (5% aqueous,25℃)	5.5 ~ 6.5	6.1	Digital pH Meter
Loss on Drying	≤0.5%	0.09%	Gravimetric (105℃,3h)
Residue on Ignition (Ash)	≤0.1%	0.02%	Gravimetric (550℃)
Heavy Metals (Pb)	≤0.5 ppm	0.04 ppm	ICP-MS
Heavy Metals (As)	≤0.2 ppm	0.01 ppm	ICP-MS
Iron (Fe)	≤5 ppm	1.0 ppm	Colorimetric Method
Chloride (Cl^-)	≤0.01%	0.002%	Titrimetric Method
Sulfate (SO_4^{2-})	≤0.01%	0.002%	Turbidimetric Method
Solubility in Water (25℃)	≥350 g/L	360 g/L	Gravimetric Method
Microbiology	Total Plate Count ≤50 CFU/g	<10 CFU/g	GB 4789.2
	E. coli/Salmonella: Negative	Negative	GB 4789.3/4
Heat Stability	≥95% retention at 121℃ (30mins)	98.8%	HPLC

3. Application Fields & Recommended Dosage

L-Proline is a multi-functional amino acid for **animal feed, food, pharmaceuticals, cosmetics and biotech**. Dosage can be adjusted according to application scenarios, functional requirements and raw material formulations.

Industry	Application Scenario	Recommended Dosage	Core Function
Animal Feed	Poultry/swine/aquaculture (stress period/growth stage)	0.05% ~ 0.20% of total feed	Improve stress resistance, promote growth, enhance meat quality
Food & Beverage	Fortified cereals, protein bars, milk powder, health drinks, flavor enhancers	0.05% ~ 0.30% of finished product	Nutritional fortification, collagen synthesis, flavor improvement
Dietary Supplements	Tablets, capsules, powder sachets, amino acid blends, beauty supplements	300mg ~ 1500mg per serving	Support joint/skin health, collagen formation, anti-fatigue
Pharmaceuticals	Amino acid infusions, enteral nutrition, wound care, peptide synthesis	As per pharmaceutical formulation	Nutritional support, tissue repair, pharmaceutical intermediate
Cosmetics	Moisturizers, serums, anti-aging creams, hair conditioners	1.0% ~ 5.0% of finished product	Natural moisturizer, enhance skin elasticity, improve hair hydration
Biotechnology	Mammalian cell culture medium, microbial fermentation	0.1% ~ 0.5% of medium	Cell osmoprotectant, promote cell growth and proliferation

4. Usage Guidelines & Processing

1. **Solid System Incorporation**: Directly mix with other solid ingredients (flour, feed powder, excipients, cosmetic powders) at any production stage; pre-mix with a carrier (e.g., corn starch, maltodextrin) for uniform distribution in bulk formulations.
2. **Liquid System Incorporation**: Dissolve in water (room temperature) with mild agitation; dissolves rapidly and completely without heating, suitable for liquid food, beverages, pharmaceuticals and cosmetics.
3. **Dust Control**: Minimize violent pouring/agitation to reduce dust generation; use dry equipment to prevent moisture absorption and caking.

5. Packaging & Storage

Grade	Packaging	Application Scenario
Sample	100g/500g Sealed HDPE Bottles	Formulation testing, small-batch trial
Commercial	1kg/5kg Vacuum-Sealed Aluminum Foil Bags	Small-batch food/feed/pharm/cosmetic production
Bulk (Feed/Food)	20kg/25kg Multi-Wall Paper Sacks (PE-lined, moisture-proof)	Industrial large-scale feed/food production
Bulk (Pharm/Cosmetic)	20kg/25kg HDPE Drums (inner aluminum foil, sterile)	Pharmaceutical/cosmetic/biotech production
Custom	Customized packaging (50g-10kg)	OEM/ODM according to customer requirements

6. Quality Assurance & Regulatory Compliance

- Produced in **ISO 9001 (Quality)**, **ISO 22000 (HACCP, Food Safety)**, **GMP (Pharm/Cosmetic)** and **ISO 22716 (Cosmetic)** certified facilities.
- Microbial fermentation with non-GMO strains; multi-step purification (ultrafiltration, crystallization, vacuum drying) ensures high purity and low impurities; no solvent residues.
- Full production traceability (batch number tracking from raw material to finished product); strict in-process quality control (IPC) for all production stages.