Safety Data Sheet (MSDS)

(According to GB/T 16483 and GB/T 17519; Adapts to GHS, IMDG, IATA Standards)

L-Lysine Free (50%)

Revision Date: 25 FEB 2026

SECTION 1: Identification of the Substance/Mixture and of the Company/Undertaking

1.1 Product Identifiers

- Product Name: L-Lysine Free (50%)
- Product Number: LLF-50-20260225
- Brand: SIGALD
- CAS-No.: 56-87-1
- Synonyms: L-2,6-Diaminohexanoic acid 50% aqueous solution; (S)-2,6-Diaminohexanoic acid 50%
- EINECS/EC-No.: 200-294-2

1.2 Details of the supplier of the safety data sheet

- Company: NEWAY SINOPHC TECH. LIMITED
- Address: RM. 204, BUILDING 3, NO. 188, AONA RD., CHINA (SHANGHAI) PILOT FREE TRADE ZONE.
- Telephone: +86-021-50350029
- Fax: +86-021-50350029

1.3 Emergency telephone

- Emergency Phone #: +86-021-50350029 (CHEMTREC)

1.4 Relevant Identified Uses and Uses Advised Against

- Identified Uses: Food additive (nutritional fortifier); feed additive (animal nutrition supplement); cosmetic raw material (skin care humectant); industrial raw material (organic synthesis intermediate, biochemical reagent).
- Uses Advised Against: No restricted uses for intended applications; avoid undiluted direct contact with eyes for sensitive individuals.

SECTION 2: Hazards Identification

|Summary of Emergency Measures|Colorless clear homogeneous liquid, almost odorless. Practically non-toxic; may cause mild eye irritation in sensitive individuals; no skin irritation or respiratory hazard. After inhalation: No special treatment needed, move to fresh air if discomfort occurs. In case of skin contact: Rinse with water if needed. After eye contact: Rinse with plenty of water for 5-10 minutes if irritation occurs. After swallowing: No harmful effects, drink water if needed. Non-flammable, no explosion risk.| |---|

2.1 GHS Classification

- Serious eye irritation (Category 2A) - *only for undiluted solution in sensitive individuals*

2.2 GHS Label Elements

- Hazard Pictogram: (Exclamation mark) - *for industrial packaging only*
- Signal Word: **Warning** - *for industrial packaging only*

- Hazard Statements: H319 - Causes serious eye irritation (in sensitive individuals)
- Precautionary Statements: P280 - Wear eye protection; P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.

2.3 Physical and Chemical HazardsNon-flammable liquid; no explosive, oxidizing or corrosive properties under normal conditions; stable under recommended storage conditions; no hazardous decomposition at normal temperature and pressure; incompatible with strong oxidizing agents and strong acids in high concentration.

2.4 Health Hazards

- Acute: Practically non-toxic via oral/dermal/inhalation route; mild transient eye redness/tearing may occur in sensitive individuals upon undiluted contact; no skin irritation, respiratory irritation or gastrointestinal discomfort.
- Chronic: No known chronic health hazards with long-term intended use; no organ damage, mutagenic, carcinogenic or reproductive toxic effects.

2.5 Environmental HazardsNon-toxic to aquatic organisms; fully biodegradable in natural environment; no bioaccumulation potential; no persistent environmental residues; environmentally friendly, can be discharged after conventional biological treatment.

2.6 Other HazardsNo additional hazards identified under normal use, storage and transport conditions.

SECTION 3: Composition/Information on Ingredients

- Substance / Mixture: **Solution (50% active ingredient in food-grade deionized water)** | 3.1 Main Component | L-Lysine Free (50%) | | --- | --- | | Formula | C_6 $H_{14}N_2O_2$ | | Molecular Weight | 146.19 g/mol (Active Ingredient) | | CAS-No.: | 56-87-1 | | EC-No.: | 200-294-2 |

Component	Classification	Concentration (w/w)
L-Lysine Free	Eye Irrit.2A (sensitive individuals)	48.0-52.0%
Food-Grade Deionized Water	Non-hazardous	Balance

SECTION 4: First Aid Measures

4.1 Description of First-Aid Measures

- If Inhaled: No special treatment required. Move to fresh air if slight discomfort occurs; rest and breathe normally.
- In Case of Skin Contact: No special treatment needed. Rinse skin with running water only if accidental prolonged contact occurs; pat dry gently.
- In Case of Eye Contact: Rinse eyes thoroughly with plenty of clean running water for 5-10 minutes if irritation is felt. Remove contact lenses if present. Consult a doctor only if irritation persists for more than 24 hours.
- If Swallowed: No harmful effects for human/animal consumption in normal dosage. Rinse mouth with water; drink a small amount of water if needed. Do not induce vomiting; no medical treatment required unless large quantity is swallowed accidentally (rare).

4.2 Most Important Symptoms and Effects, Both Acute and Delayed

- Acute: Transient mild eye irritation (redness/tearing) in sensitive individuals (undiluted contact); no other acute symptoms.
- Delayed: No known delayed toxic effects for intended use.

4.3 Indication of Any Immediate Medical Attention and Special Treatment NeededNo immediate medical attention required for normal exposure; consult a doctor only if eye irritation persists or accidental large-quantity swallowing causes gastrointestinal discomfort (extremely rare); no specific antidote needed, treat symptomatically.

SECTION 5: Firefighting Measures

5.1 Extinguishing Media

- Suitable: Water spray, carbon dioxide (CO_2), dry chemical powder, foam.
- Unsuitable: No limitations of extinguishing agents; all common agents are applicable.

5.2 Special Hazards Arising from the Substance or MixtureNon-flammable liquid; no hazardous combustion products at normal fire temperature; high temperature (>200℃) may cause slight decomposition to produce non-toxic ammonia and carbon dioxide; no explosive decomposition, no toxic fumes generated.

5.3 Advice for FirefightersNo special protective equipment required for normal firefighting; wear standard fire-fighting gear (helmet, fire coat, gloves). Use water spray to cool surrounding containers if needed; no risk of container rupture due to heat. Evacuate to upwind area only if large-scale fire causes heavy smoke.

SECTION 6: Accidental Release Measures

6.1 Personal Precautions, Protective Equipment and Emergency ProceduresNo special personal precautions needed for normal spills; wear nitrile gloves and safety glasses for large-scale spills to avoid eye/skin contact. Ensure basic ventilation; no need to evacuate non-essential personnel.

6.2 Environmental PrecautionsNo special environmental precautions; the product is fully biodegradable. Prevent large-quantity spilled liquid from entering drinking water sources directly; dilute with water if needed before discharge to sewer.

6.3 Methods and Materials for Containment and Cleaning Up

- Small Spill: Wipe up with absorbent paper or cloth; rinse the area with water; dispose of contaminated paper/cloth as general waste.
- Large Spill: Contain with sandbags or plastic sheeting if needed; collect with a pump into sealed HDPE containers for reuse or disposal; rinse the spill area with plenty of water.6.4 Reference to Other SectionsFor waste disposal, see Section 13; no special personal protection required (Section 8).

SECTION 7: Handling and Storage

7.1 Precautions for Safe HandlingNo special safety precautions for routine handling; operate in a well-ventilated area for large-scale production. Avoid generating unnecessary mist; no

mixing with strong oxidizing agents or high-concentration strong acids. Wash hands with water after handling (good hygiene practice); no restriction on eating/drinking in workplace with normal hygiene.

7.2 Conditions for Safe Storage

- Storage Conditions: Store in a cool, dry, well-ventilated warehouse. Temperature ≤30℃, relative humidity ≤75%. Keep the container tightly sealed to prevent contamination and evaporation. Store away from direct sunlight and heat sources.
- Incompatibilities: Strong oxidizing agents (H_2O_2, $KMnO_4$), high-concentration strong mineral acids (concentrated HCl/H_2SO_4).
- Storage Class (TRGS 510): 13 (Non-Hazardous Liquids)
- Shelf Life: **24 months (unopened, under specified storage conditions)**; 6 months after opening (sealed, refrigerated at 2-8℃).
- Segregation: Store separately only from strong oxidizing agents and high-concentration strong acids; can be stored with other food/feed/cosmetic raw materials; no special segregation required.

SECTION 8: Exposure Controls/Personal Protection

8.1 Control Parameters

- Occupational Exposure Limit (OEL): No specific OEL for L-Lysine (GRAS certified by FDA, food-grade safe).
- Biological Limit Value (BLV): N/A

8.2 Exposure Controls

- Engineering Controls: No special engineering controls required; basic ventilation is sufficient for all handling operations.
- Personal Protective Equipment (PPE) - *minimal protection needed*:
  - Eye/Face Protection: Safety glasses recommended for large-scale handling (to avoid accidental splashing); no face shield required for normal use.
  - Skin Protection: Nitrile rubber gloves recommended for prolonged contact; ordinary gloves sufficient for routine use.
  - Respiratory Protection: Not required under any normal handling conditions (no dust/mist inhalation hazard).
  - Other: No special PPE needed; ordinary work clothes are sufficient.

SECTION 9: Physical and Chemical Properties

9.1 Information on Basic Physical and Chemical Propertiesa) Physical State: Liquidb) Color: Colorless to pale yellowc) Odor: Almost odorlessd) Melting Point/Freezing Point: ≤ 0℃ (aqueous solution)e) Boiling Point: 100-105℃ (water evaporation, no decomposition of L-Lysine)f) Flammability: Non-flammable liquidg) Flammability Limits: Not applicableh) Flash Point: > 100℃ (Closed Cup)i) Autoignition Temperature: Not applicablej) Decomposition Temperature: ≥ 200℃ (slight decomposition to ammonia and CO_2)k) pH Value (25℃): 6.0-8.0l) Viscosity (25℃):

10-30 mPa·sm) Solubility: Fully miscible with water; soluble in methanol/ethanol; slightly soluble in propylene glycol; insoluble in ether/benzene/hexanen) Partition Coefficient (log P, n-octanol/water): -2.AA5 (25℃)o) Vapor Pressure (25℃): < 0.8 kPa (equivalent to water vapor pressure)p) Density (25℃): 1.05-1.15 g/cm³q) Relative Vapor Density: >1 (air=1)r) Explosive Properties: No explosive propertiess) Oxidizing Properties: None

9.2 Other Safety InformationStable at low temperature (0-5℃), no precipitation or crystallization; slight viscosity increase at low temperature, recovers to normal at room temperature; compatible with most food/feed/cosmetic raw materials (excluding strong oxidizing agents).

SECTION 10: Stability and Reactivity

10.1 Chemical Stability: Highly stable under recommended storage and use conditions (≤30℃, sealed); no chemical changes for 24 months when unopened; stable in food/feed/cosmetic formulations with pH 4.0-9.0.10.2 Possibility of Hazardous Reactions: No hazardous reactions under normal intended use; no reaction with water, alcohols or common organic solvents; reacts with strong oxidizing agents only in high concentration (no risk for normal use).10.3 Conditions to Avoid: High temperature (>200℃), direct sunlight for prolonged period, contact with strong oxidizing agents/high-concentration strong acids.10.4 Incompatible Materials: Strong oxidizing agents, concentrated mineral acids (HCl/H_2SO_4 > 50%), strong oxidizing food/feed additives.10.5 Hazardous Decomposition Products: Ammonia, carbon dioxide (only at >200℃); no toxic, flammable or explosive decomposition products under any normal conditions.

SECTION 11: Toxicological Information

11.1 Information on Toxicological Effects

- Acute Toxicity (L-Lysine Free):
  - Oral (Rat, LD_{50}): > 10,000 mg/kg (Practically non-toxic, GRAS)
  - Dermal (Rabbit, LD_{50}): > 20,000 mg/kg (No dermal toxicity)
  - Inhalation (Rat, LC_{50}): > 50 mg/m³ (4-hour mist exposure, No respiratory toxicity)
- Skin Corrosion/Irritation: Rabbit 4-hour patch test - No irritation (0/4 score), no erythema/edema.
- Serious Eye Damage/Irritation: Rabbit eye test - Mild transient irritation (1/4 score) in sensitive individuals (undiluted contact), reversible within 24 hours without treatment.
- Respiratory or Skin Sensitization: No sensitizing effects (Guinea pig test - negative).
- Mutagenicity/Carcinogenicity: Ames test, chromosome aberration test - negative; IARC Classification - Group 3 (not classifiable); FDA GRAS certified (no carcinogenic risk).
- Reproductive Toxicity: No adverse reproductive/developmental effects in animal tests (rat/mouse) at doses up to 5000 mg/kg/day; no teratogenic or embryotoxic effects.
- Specific Target Organ Toxicity: No target organ toxicity for oral/dermal/inhalation route; no acute/chronic organ damage.

SECTION 12: Ecological Information

12.1 Toxicity

- Fish (Zebrafish, 96h LC_{50}): > 10,000 mg/L (aqueous solution)
- Daphnia (48h EC_{50}): > 10,000 mg/L (aqueous solution)
- Freshwater Algae (72h EC_{50}): > 10,000 mg/L (aqueous solution)12.2 Persistence and Degradability: Fully biodegradable (BOD_5 /COD = 0.75); degraded by microorganisms in aquatic/soil environment within 7-10 days; no persistent residues.12.3 Bioaccumulative Potential: Negligible (log P=-2.55); no bioaccumulation in aquatic organisms or food chain; no biomagnification observed.12.4 Mobility in Soil: High mobility (fully water-soluble); no leaching risk to groundwater due to rapid biodegradation by soil microorganisms.12.5 PBT/vPvB Assessment: Not classified as PBT/vPvB substances (no persistence, no bioaccumulation, non-toxic).12.6 Other Adverse Effects: No known adverse effects on soil microorganisms, terrestrial plants or aquatic beneficial bacteria; can be used as a nutritional supplement for microorganisms in wastewater treatment.

SECTION 13: Disposal Considerations

13.1 Waste Treatment Methods

- Product Waste: Expired/unused product is non-hazardous; can be disposed of as general industrial waste, or diluted and discharged to municipal sewer (after biological treatment). Food/feed grade waste can be recycled as animal feed additive (if not contaminated).
- Packaging Waste: Rinse packaging with water to remove residual liquid; dispose of as non-hazardous waste or recycle (HDPE/glass packaging); no hazardous waste treatment required.
- Diluted Solution Waste: No special disposal required; can be discharged directly to sewer after conventional biological treatment (complies with wastewater discharge standards).
- Disposal Compliance: Comply with China national wastewater discharge standards, EU EWC 070801 (non-hazardous organic waste), US RCRA Non-Hazardous Waste.

SECTION 14: Transport Information

14.1 UN Number: ADR/RID: -; IMDG: -; IATA-DGR: -14.2 UN Proper Shipping Name: ADR/RID: Not dangerous goods; IMDG: Not dangerous goods; IATA-DGR: Not dangerous goods14.3 Transport Hazard Class(es): ADR/RID: -; IMDG: -; IATA-DGR: -14.4 Packaging Group: ADR/RID: -; IMDG: -; IATA-DGR: -14.5 Environmental Hazards: ADR/RID: No; IMDG Marine Pollutant: No; IATA -DGR: No14.6 Special Precautions for User: Transport at ≤35℃; avoid direct sunlight, rain and severe collision during transport; no temperature control required for normal transport.14.7 Incompatible Materials: Avoid transport with large quantities of strong oxidizing agents or concentrated strong acids (no need for separate transport for small quantities).
Further Information: Classified as **non-dangerous goods** for all transport modes; can be transported with food/feed/cosmetic raw materials; no special transport documentation required (MSDS/COA sufficient for customs clearance).

SECTION 15: Regulatory Information

15.1 National/International Regulations

- China: National Food Safety Standard (GB 1886.203-2016, food additive); Feed Additive Standard (NY/T 394-2020); Cosmetic Safety Technical Specification (2021 version); Non-hazardous chemical classification.
- EU: REACH (Annex XVII compliant, not in SVHC List); CLP (GHS non-hazardous except mild eye irritation); EU Food Additive Regulation (EC 1333/2008, E641); Feed Additive Regulation (EC 1831/2003).
- US: FDA GRAS (21 CFR 172.320, food additive); TSCA listed on Inventory; OSHA Hazard Communication Standard (29 CFR 1910.1200, non-hazardous).
- International: FAO/WHO Joint Expert Committee on Food Additives (JECFA) approved; Codex Alimentarius Commission (CAC) certified; ISO 9001/ISO 22000 (food safety) compliant.

15.2 Additional Regulatory RequirementsComply with food/feed/cosmetic grade production standards (cGMP); provide English COA/MSDS for customs clearance; mark **Food/Feed/Cosmetic Grade, L-Lysine Free (50%)** on product packaging; no special labeling required for non-hazardous transport.

SECTION 16: Other Information

- Further Information: This MSDS complies with GB/T 16483, GB/T 17519, GHS Rev.9 and international food/feed/cosmetic safety standards. L-Lysine is an essential amino acid for humans/animals, GRAS certified, non-toxic for intended use. This 50% aqueous solution is designed for easy formulation and application in food/feed/cosmetic/industrial fields.
- Revision Date: 25 FEB 2026
- Disclaimer: The supplier is not liable for any damage caused by improper use (e.g., mixing with strong oxidizing agents) or non-compliance with storage/handling requirements; the product is only for intended food/feed/cosmetic/industrial use.