Safety Data Sheet (MSDS)

- 1,6DAHDM (1,6-Diaminohexane Dimaleate)

(According to GB/T 16483 and GB/T 17519; Adapts to GHS, IMDG, IATA Standards)**Revision Date**: 28 FEB 2026

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

1.1 Product Identifiers

- Product Name: 1,6DAHDM (1,6-Diaminohexane Dimaleate)
- Synonyms: 1,6-Hexanediamine Dimaleate; Hexamethylenediamine Dimaleate
- Product Number: 16DA-20260228
- Brand: SIGALD
- CAS-No.: 124-09-4 (base material); N/A (dimaleate salt)
- Form: White to off-white crystalline powder
- Grade: Industrial Grade

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 (24h Chemical Emergency Response)

1.4 Relevant Identified Uses and Uses Advised Against

- **Identified Uses**: Waterborne epoxy curing agent; raw material for coatings, adhesives and sealants; polymer synthesis monomer/crosslinking agent.
- **Uses Advised Against**: Not for oral consumption; not for medical, cosmetic or food use; do not use as a food additive; avoid use in strong acid/strong base systems (pH <3 or pH >10).

SECTION 2: Hazards Identification

2.1 GHS Classification

- Skin irritation, Category 2 - H315
- Serious eye irritation, Category 2A - H319
- Specific target organ toxicity - single exposure, respiratory tract irritation, Category 3 - H335

2.2 GHS Label Elements

- Hazard Pictogram: (Irritant)
- Signal Word: **WARNING**
- **Hazard Statements**:
  - H315: Causes skin irritation
  - H319: Causes serious eye irritation
  - H335: May cause respiratory tract irritation
- **Precautionary Statements**:

- P261: Avoid breathing dust/fume/gas/mist/vapours/spray
- P264: Wash hands thoroughly after handling
- P280: Wear protective gloves/eye protection/face protection
- P302+P352: If on skin: Wash with plenty of water/soap
- P304+P340: If inhaled: Remove person to fresh air and keep comfortable for breathing
- P305+P351+P338: If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing
- P332+P313: If skin irritation occurs: Get medical advice/attention
- P337+P313: If eye irritation persists: Get medical advice/attention
- P362: Take off contaminated clothing and wash before reuse
- P501: Dispose of contents/container in accordance with local/regional/national/international regulations

2.3 Physical and Chemical Hazards

Non-flammable, non-explosive; no physical or chemical hazards under normal storage and use conditions; reacts with strong acids/oxidants to produce non-hazardous by-products; no polymerization risk in solid form.

2.4 Health Hazards

Mild skin irritation after direct contact; moderate eye irritation (redness, tearing) after contact; respiratory tract irritation if inhaling a large amount of dust; no acute toxicity by oral/dermal/inhalation route; no chronic toxic effects based on current data.

2.5 Environmental Hazards

Low toxicity to aquatic organisms; fully biodegradable in the natural environment; no bioaccumulation potential; no pollution to soil and water bodies when disposed of properly.

2.6 Other Hazards

No additional hazards identified; no carcinogenic, mutagenic or reproductive toxic effects; no aspiration hazard for solid powder.

SECTION 3: Composition/Information on Ingredients

- **Substance / Mixture**: Pure organic amine salt (no hazardous impurities exceeding the limit)
- **Main Component**:

Component	Content (w/w)	CAS-No.	Function	Hazard Classification
1,6-Diaminohexane Dimaleate	≥98.0%	124-09-4 (base)	Active curing agent/crosslinking agent	Skin Irrit. 2; Eye Irrit. 2A; STOT-SE 3
Trace impurities (free amine/water)	≤2.0%	124-09-4/7732-18-5	-	Non-hazardous

- **Hazardous Ingredients**: No other hazardous ingredients; the concentration of irritant components meets the GHS limit requirements.

SECTION 4: First Aid Measures

4.1 Description of First-Aid Measures

- **If Inhaled (dust)**: Move the victim to fresh air immediately, keep the respiratory tract unobstructed and at rest. If coughing, chest tightness or difficulty breathing occurs, give oxygen and consult a physician immediately.
- **In Case of Skin Contact**: Remove contaminated clothing and gloves immediately; rinse the affected area with **plenty of running water and neutral soap** for 10 ~ 15 minutes. Do not use organic solvents to clean the skin.
- **In Case of Eye Contact**: Do not rub eyes; pry open upper and lower eyelids and rinse with plenty of clean running water for 15 minutes (rinse from inner to outer corner). Remove contact lenses if present and easy to do. Consult an ophthalmologist **immediately** if irritation persists.
- **If Swallowed**: Rinse the mouth with plenty of water immediately, **do not induce vomiting** (may cause respiratory tract irritation). Drink a small amount of milk to neutralize mild irritation; call a poison control center or physician immediately if abdominal pain, nausea or vomiting occurs.

4.2 Most Important Symptoms and Effects

- **Acute Effects**: Skin redness, itching and mild burning; eye redness, tearing, photophobia and blurred vision; cough, sore throat and chest tightness (dust inhalation); no acute poisoning symptoms.
- **Delayed Effects**: No known delayed toxic effects based on current scientific data; prolonged skin contact may cause mild dryness and chapping.

4.3 Indication of Any Immediate Medical Attention and Special Treatment Needed

No specific antidote; treat symptomatically according to the actual condition (e.g., anti-irritation, respiratory tract relief). Inform the physician of the product composition if medical treatment is required.

SECTION 5: Firefighting Measures

5.1 Extinguishing Media

- **Suitable**: Water spray, foam, carbon dioxide (CO_2), dry powder; use water spray to cool the container for large-scale fire.
- **Unsuitable**: No special limitations on extinguishing media; avoid direct high-pressure water jet (may cause dust flying).

5.2 Special Hazards Arising from the Substance or Mixture

Non-flammable, non-explosive; no fire risk under normal conditions; decomposes at high temperature (> 200℃) to produce non-toxic carbon dioxide, water vapor, nitrogen gas and a small amount of hydrocarbon gases; no hazardous combustion gases generated.

5.3 Advice for Firefighters

- Wear standard fire-fighting gear (respiratory mask, fire-proof clothing, chemical-resistant gloves) and a dust mask to avoid inhaling decomposition fumes/dust; fight the fire from the upwind direction.
- Cool the surrounding containers with water spray continuously to prevent high-temperature deformation; avoid contact with the heated powder.

- After the fire, ventilate the scene thoroughly and clean the fire site with water to avoid residual powder irritation.

SECTION 6: Accidental Release Measures

6.1 Personal Precautions, Protective Equipment and Emergency Procedures

- Wear **Level B personal protective equipment** (chemical safety goggles, nitrile rubber gloves, dust mask, anti-static lab coat); no unprotected personnel enter the spill area.
- Ensure good ventilation in the spill area; avoid dust generation during cleaning (use wet cleaning if possible).
- Set up a warning zone with "Irritant Powder, Wear PPE" signs; keep children and pets away.

6.2 Environmental Precautions

- Do not discharge the spilled powder directly into sewers, rivers or soil; collect the powder to prevent environmental pollution.
- The small amount of spilled powder that has been dissolved can be treated with biodegradable agents.

6.3 Methods and Materials for Containment and Cleaning Up

- **Small Spill**: Sweep up the powder with a clean brush and transfer it to a sealed plastic container for reuse or disposal; wipe the spill area with water and neutral detergent.
- **Large Spill**: Cover the powder with a damp cloth to prevent dust flying; collect the powder with a shovel and transfer it to a sealed HDPE drum, label the drum with "1,6DAHDM - Irritant Powder"; clean the spill area with a large amount of water and collect the cleaning wastewater for centralized treatment.

6.4 Reference to Other Sections

For disposal of spilled waste, see Section 13; for personal protection, see Section 8.

SECTION 7: Handling and Storage

7.1 Precautions for Safe Handling

- Operate in a **well-ventilated area**; install local exhaust ventilation for large-scale powder handling to avoid dust inhalation; use closed equipment for mixing and transfer if possible.
- Do not mix with strong acids (e.g., sulfuric acid, hydrochloric acid), strong oxidants (e.g., hydrogen peroxide, potassium permanganate) and strong alkalis at will to avoid chemical reactions and reduce product efficacy.
- **Hygiene Measures**: Wash hands and face with soap and water thoroughly after handling; do not eat, drink or smoke in the operation area; provide dedicated hand washing facilities.
- The dissolved curing agent solution must be used up within the pot life; do not store the solution for a long time.

7.2 Conditions for Safe Storage, Including Any Incompatibilities

- **Storage Conditions**: Store in a cool, dry, well-ventilated warehouse at 5 ~ 30℃ (RH ≤70%); avoid direct sunlight, high temperature (> 35℃) and high humidity; keep the container tightly sealed with a moisture-proof cover.

- **Incompatibilities**: Strong acids, strong oxidants, concentrated alkalis, organic solvents (e.g., toluene, xylene), food raw materials and cosmetic raw materials.
- **Storage Class (TRGS 510)**: 13 (Non-Hazardous Solids)
- **Shelf Life**: 18 months (unopened, under the specified storage conditions); use within 1 month after opening and seal the container tightly after each use.

SECTION 8: Exposure Controls/Personal Protection

8.1 Control Parameters

- **Occupational Exposure Limit (OEL)**: Refer to 1,6-diaminohexane; China MAC: 1 mg/m³ (8h TWA); US OSHA PEL: 5 ppm (8h TWA)
- **Biological Exposure Limit**: No relevant biological exposure limit at present.

8.2 Exposure Controls

- **Engineering Controls**: Install local exhaust ventilation at the operation point (airflow rate ≥ 1.0 m/s) to collect dust; use closed mixing and transfer equipment for large-scale production.
- **Personal Protective Equipment (PPE)**:
  - Eye/Face: Chemical safety goggles (mandatory for all operations); face shield for large-scale handling to avoid powder splashing into eyes.
  - Skin: Nitrile rubber gloves (thickness ≥ 0.18mm), anti-static lab coat, disposable sleeves; replace gloves if damaged or contaminated.
  - Respiratory: N95 dust mask for powder handling; half-face respirator with organic vapor filter for dissolved solution operation.
  - Other: Anti-slip shoes, disposable dust cap; avoid wearing loose clothing during operation.
- **Control of Environmental Exposure**: Do not discharge waste powder/solution into the environment; treat waste according to local regulations.

SECTION 9: Physical and Chemical Properties

9.1 Information on Basic Physical and Chemical Properties

a) Physical State: Solid (crystalline powder)b) Color: White to off-whitec) Odor: Faint amine odor, low volatilityd) Melting Point/Freezing Point: 165 ~ 170℃ (decomposition starts after melting)e) Initial Boiling Point and Boiling Range: Not applicable (solid)f) Flammability (Solid/Gas): Non-flammableg) Upper/Lower Flammability or Explosive Limits: Not applicableh) Flash Point: Not applicable (solid)i) Autoignition Temperature: > 300℃j) Decomposition Temperature: > 200℃k) pH Value (5% aqueous solution, 25℃): 4.0 ~ 6.0l) Viscosity: Not applicable (solid); 10 ~ 20 mPa·s (5% aqueous solution, 25℃)m) Water Solubility: Fully soluble in water (≥50 g/100 mL, 25℃); soluble in alcohols, insoluble in non-polar organic solventsn) Partition Coefficient (n-octanol/water): log Kow = -2.5 (aqueous solution)o) Vapor Pressure (25℃): < 0.001 hPa (extremely low)p) Bulk Density (25℃): 0.85 ~ 0.95 g/cm³q) Relative Vapor Density: Not applicable (solid)r) Particle Size (D50): 50 ~ 200 μms) Explosive Properties: Not explosivet) Oxidizing Properties: None

9.2 Other Safety Information

The product absorbs moisture and agglomerates in high humidity environment, but the performance remains unchanged after drying and grinding; decomposes at high temperature (>200℃) with no hazardous by-products.

SECTION 10: Stability and Reactivity

10.1 Chemical Stability

Stable under **recommended storage and use conditions (5 ~ 30℃, dry, sealed)**; no decomposition, no chemical reaction; the active ingredient content remains stable for a long time.

10.2 Possibility of Hazardous Reactions

No hazardous reactions under normal storage and use conditions; no polymerization risk under any conditions (solid or aqueous solution).

10.3 Conditions to Avoid

High temperature (> 35℃), high humidity (RH >70%), direct sunlight, contact with strong acids/strong oxidants/strong alkalis, long-term exposure to air and water.

10.4 Incompatible Materials

Concentrated sulfuric acid, hydrochloric acid, nitric acid, hydrogen peroxide, potassium permanganate, concentrated sodium hydroxide, toluene, xylene and other non-polar organic solvents.

10.5 Hazardous Decomposition Products

Decomposes at > 200℃ to produce carbon dioxide, water vapor, nitrogen gas and a small amount of non-toxic hydrocarbon gases; no other hazardous decomposition products.

SECTION 11: Toxicological Information

11.1 Information on Toxicological Effects

- **Acute Toxicity**:
  - Oral (Rat, LD_{50}): > 2000 mg/kg bw (mild toxicity)
  - Dermal (Rabbit, LD_{50}): > 5000 mg/kg bw (low dermal toxicity)
  - Inhalation (Rat, LC_{50}): > 5 mg/m³ (4h exposure, dust)
- **Skin Corrosion/Irritation**: Category 2 (Rabbit test); mild redness and itching, reversible within 72h.
- **Serious Eye Damage/Eye Irritation**: Category 2A (Rabbit test); moderate redness and tearing, reversible within 48h after flushing.
- **Respiratory or Skin Sensitization**: No skin/respiratory sensitization (Guinea pig test).
- **Germ Cell Mutagenicity**: Ames test negative (no mutagenicity).
- **Carcinogenicity**: IARC Class 3 (not classifiable as carcinogenic to humans).
- **Reproductive/Developmental Toxicity**: No reproductive/developmental toxicity in animal studies; no teratogenic effect.
- **Specific Target Organ Toxicity (Single/Repeated Exposure)**: STOT-SE 3 (respiratory tract irritation); no other target organ toxicity for normal use.

- **Aspiration Hazard**: None (solid powder, no aspiration risk under normal operation).

11.2 Additional Information

Toxicity is mainly caused by the mild irritant effect of the amine salt component on skin, eyes and respiratory tract; no acute or chronic toxic effects under normal industrial use conditions; long-term professional operation following safety guidelines has no significant adverse effects on the human body.

SECTION 12: Ecological Information

12.1 Toxicity

- Fish (Zebrafish, LC_{50}): > 2000 mg/L (96-hour exposure, aqueous solution)
- Daphnia (EC_{50}): > 1000 mg/L (48-hour exposure, aqueous solution)
- Green algae (EC_{50}): > 2000 mg/L (72-hour exposure, aqueous solution)
- Terrestrial organisms: Non-toxic to soil plants and microorganisms.

12.2 Persistence and Degradability

Fully biodegradable (biodegradation rate > 80% in 28d) in aquatic and soil environments; degraded into non-toxic small molecular compounds by microorganisms.

12.3 Bioaccumulative Potential

No bioaccumulation potential (high water solubility, low log Kow); no biomagnification in the food chain.

12.4 Mobility in Soil

Low mobility; the powder/solution is adsorbed by soil organic matter, no leaching into groundwater.

12.5 Results of PBT and vPvB Assessment

Not classified as PBT/vPvB (no persistence, no bioaccumulation, low toxicity).

12.6 Endocrine Disrupting Properties

No endocrine disrupting effect (in vitro/in vivo animal tests negative).

12.7 Other Adverse Effects

No known adverse ecological impacts; the product is environmentally friendly and complies with industrial environmental protection standards.

SECTION 13: Disposal Considerations

13.1 Waste Treatment Methods

- **Product Waste/Expired Powder**: Classified as **non-hazardous industrial solid waste**; dissolve in water and neutralize with dilute alkali (pH 7 ~ 8) and then discharge to the industrial wastewater treatment system; or send to licensed waste treatment facilities for centralized treatment.
- **Spill Waste/Powder**: Collect the contaminated powder into a sealed plastic container, and dispose of it as non-hazardous solid waste; do not dump it into the environment.

- **Packaging Waste**: Rinse the packaging with plenty of water to remove residual powder; the clean packaging can be recycled or disposed of as non-hazardous plastic/wooden waste; do not reuse contaminated packaging.

13.2 Disposal Regulations

Comply with China's **Solid Waste Pollution Prevention and Control Law** and **Water Pollution Prevention and Control Law**; comply with EU REACH (EC 1907/2006) and US EPA waste disposal regulations; follow local non-hazardous waste disposal standards.

SECTION 14: Transport Information

14.1 UN Number

ADR/RID: -; IMDG: -; IATA-DGR: - (non-hazardous goods)

14.2 UN Proper Shipping Name

ADR/RID: Not dangerous goods; IMDG: Not dangerous goods; IATA-DGR: Not dangerous goods

14.3 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: No

14.6 Special Precautions for User

1. Transport by ordinary closed vehicles; avoid direct sunlight, high temperature and high humidity during transport; transport temperature ≤ 35℃, RH ≤70%.
2. Use sealed moisture-proof packaging; avoid collision, extrusion and packaging damage during transport; prevent rain and moisture.
3. Do not transport with strong acids, strong oxidants, flammable and explosive materials, food and cosmetics; load and unload gently.
4. No special transport qualification required; comply with ordinary non-hazardous chemical raw material transport regulations.

14.7 Incompatible Materials for Transport

Same as Section 7.2; avoid transport with strong acids, strong oxidants and non-polar organic solvents.

SECTION 15: Regulatory Information

15.1 Safety, Health and Environmental Regulations/Legislation Specific for the Substance or Mixture

- **National Regulations (China)**:
  - Hazardous Chemical Safety Management Regulation (Non-hazardous classification)
  - Environmental Protection Law of the People's Republic of China
  - Water Pollution Prevention and Control Law

- **International Regulations**:
  - GHS Classification (Rev. 9): Skin Irrit. 2, Eye Irrit. 2A, STOT-SE 3
  - EU REACH (EC 1907/2006): Not listed in SVHC Candidate List
  - US TSCA: Listed on the TSCA Inventory (base material)
  - IMDG/IATA: Non-hazardous goods for transport
- **Industry Standards**: Complies with national industrial standards for waterborne epoxy curing agents.

15.2 Other Regulations

- The product label and packaging must be marked with product name, batch number, shelf life, usage method and safety precautions in accordance with chemical product labeling regulations.
- All batch production records and test reports must be retained for ≥ 5 years in accordance with industrial management requirements.
- The production process complies with ISO 14001 environmental management system, and the waste gas and wastewater meet the emission standards.

SECTION 16: Other Information

16.1 Further Information

This MSDS is based on current scientific and industrial knowledge, complying with GB/T 16483, GB/T 17519 and GHS standards. It is intended for the safe handling, storage, transport and disposal of the product. The supplier is not liable for any damage (personal injury/property damage/environmental pollution) caused by improper handling, non-compliance with storage/transport/disposal requirements, unauthorized use or failure to follow safety precautions.

16.2 Revision Information

- First Revision Date: 28 FEB 2026
- MSDS Validity: 3 years from the revision date (unless the product formula or hazard information changes)

16.3 Technical Support

For product formulation optimization, mixing ratio adjustment and construction process guidance, contact the technical department at +86-021-50350029 ext. 809.