Safety Data Sheet (MSDS)

According to GB/T 16483 and GB/T 17519; Adapts to GHS, IMDG, IATA StandardsProduct Name: Thiamine Hydrochloride (Vitamin B1 Hydrochloride, Food Grade Crystalline Powder)**Revision Date:** February 26, 2026

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

1.1 Product Identifiers

- Product Name: Thiamine Hydrochloride (Food Grade Vitamin B1)
- Product Number: TH-20260228
- Brand: SIGALD
- CAS-No.: 67-03-8
- EINECS-No.: 200-641-8
- Synonyms: Vitamin B1 Hydrochloride; 3-[(4-Amino-2-methylpyrimidin-5-yl)methyl]-5-(2-hydroxyethyl)-4-methylthiazolium chloride hydrochloride; Food grade water-soluble vitamin
- Product Form: White crystalline free-flowing powder

1.2 Details of the Supplier

- 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 (vitamin fortifier, nutritional supplement); raw material for food, beverage, health food, infant food and dairy products; pharmaceutical intermediate for vitamin preparations.
- **Uses Advised Against**: Not for pharmaceutical injection without medical grade purification; no excessive addition beyond national food additive limit standards; avoid use in high-temperature alkaline food processing without microencapsulation.

SECTION 2: Hazards Identification

2.1 GHS Classification

Not classified as a hazardous substance or mixture under GHS (Regulation (EC) 1272/2008)

2.2 GHS Label Elements

- Hazard Pictogram: None
- Signal Word: None
- Hazard Statements: None
- Precautionary Statements: P261, P271, P330, P331

2.3 Physical and Chemical Hazards

Non-combustible, non-explosive; stable under normal use conditions; freely soluble in water, slightly hygroscopic; weak acidic in aqueous solution, decomposes in high-temperature alkaline environment; no physical/chemical hazard risks.

2.4 Health Hazards

Generally non-toxic; essential water-soluble vitamin for human/animal body; inhalation of fine crystalline powder may cause mild respiratory irritation in sensitive individuals; weak acidic powder may cause mild eye/skin irritation upon direct contact; no acute/chronic toxic effects at standard food additive use dosages; excessive oral intake may cause mild gastrointestinal discomfort (rare).

2.5 Environmental Hazards

Environmentally friendly; fully biodegradable by microorganisms; no toxic effects on aquatic/terrestrial organisms; no bioaccumulation potential; no environmental pollution risk.

2.6 Other Hazards

No additional hazards identified; dust may form slippery surfaces on hard floors after spillage.

SECTION 3: Composition/Information on Ingredients

3.1 Basic Composition

- Substance / Mixture: **Pure chemical substance (food-grade water-soluble vitamin)**
- Active Component: Thiamine Hydrochloride (98.5-99.5%, CAS 67-03-8)
- Inert Components: No artificial additives, binders, preservatives or fillers
- Hazardous Impurities: None (all heavy metals/impurities meet food grade limit requirements)
- Key Purity Index: Assay ≥98.5%, chloride content 19.8-21.2%

3.2 Hazardous Ingredients

None (all components are non-hazardous and meet national food safety standards)

SECTION 4: First Aid Measures

4.1 Description of First-Aid Measures

- **If Inhaled**: Move to fresh air, keep at rest in a comfortable breathing position. If coughing/irritation persists, rinse mouth with clean water and consult a doctor if needed.
- **In Case of Skin Contact**: Rinse skin thoroughly with running water for 5 minutes; remove contaminated clothing and wash before reuse. No special treatment required for mild contact.
- **In Case of Eye Contact**: Rinse eyes cautiously with plenty of running water for 10-15 minutes (hold eyes open while rinsing); remove contact lenses if present and easy to do. Consult a doctor if redness or irritation persists.
- **If Swallowed**: Rinse mouth with water; drink a small amount of warm water or weak alkaline drink (e.g., baking soda water) to neutralize if needed. Do not induce vomiting. No toxic effects at normal food intake; consult a doctor only if excessive ingestion causes gastrointestinal discomfort (e.g., bloating, nausea).

4.2 Most Important Symptoms and Effects

- **Acute Effects**: Mild respiratory/eye/skin irritation from fine powder inhalation or direct contact in sensitive individuals; no other acute toxic effects.
- **Delayed Effects**: No known delayed toxic effects based on long-term food, pharmaceutical and feed use data.

4.3 Immediate Medical Attention

No specific medical treatment required; treat symptomatically if irritation/symptoms persist for more than 24 hours.

4.4 Notes to Physician

Inform the physician of the product composition (pure food-grade Thiamine Hydrochloride, weak acidic water-soluble vitamin B1) if medical consultation is needed.

SECTION 5: Fire-Fighting Measures

5.1 Extinguishing Media

- **Suitable**: Water spray, foam, carbon dioxide (CO_2), dry chemical powder.
- **Unsuitable**: No limitations of extinguishing agents.

5.2 Special Hazards Arising from the Substance

Non-combustible; decomposes at extreme high temperature (>200℃) in alkaline environment to produce non-toxic carbon dioxide, water, nitrogen and trace sulfur compounds; no hazardous combustion gases; extremely low dust explosion risk in confined spaces (negligible).

5.3 Advice for Firefighters

Wear standard fire-fighting protective gear (gloves, goggles, dust respirator); avoid inhalation of thermal decomposition dust; eliminate dust cloud if possible; fight fire from a safe distance.

SECTION 6: Accidental Release Measures

6.1 Personal Precautions

Wear FFP1 dust mask, nitrile rubber gloves and safety goggles; ensure good ventilation at the spill site; wear non-slip shoes as dust may cause slippery surfaces on floors.

6.2 Environmental Precautions

No special environmental precautions; the product is biodegradable and non-polluting; sweep up spilled powder to avoid direct entry into water bodies (no eutrophication or toxic risk).

6.3 Methods for Clean-Up

- **Small Spill**: Gently sweep up the powder with a brush and collect in a sealed plastic container for reuse/disposal; wipe the floor with a weak alkaline solution (e.g., 0.1% baking soda water) then water to remove residual acidic powder and prevent slipping.
- **Large Spill**: Contain with plastic barriers; transfer to sealed drums for recycling; clean the contaminated area with weak alkaline solution then water and dry thoroughly.

6.4 Reference

For disposal, see Section 13.

SECTION 7: Handling and Storage

7.1 Precautions for Safe Handling

- Operate in a well-ventilated area; use dust suppression measures (mist spray) to avoid fine powder formation/inhalation during mixing/transfer.
- Avoid contact with strong alkalis, oxidizing agents, high temperature (>100℃) and direct sunlight to prevent decomposition and loss of activity.
- Hygiene Measures: Wash hands thoroughly with soap and water after handling; do not eat/drink/smoke while operating the product (follow food hygiene operation standards for food grade materials); avoid touching eyes/mucous membranes after handling.
- Mixing Note: Dissolve in water first for uniform dispersion in liquid food/beverage; direct dry mixing for solid food products; avoid mixing with strong alkaline food raw materials in large quantities without pre-dissolution and pH adjustment.

7.2 Conditions for Safe Storage

- **Storage Conditions**: Store in a cool, dry, dark and well-ventilated warehouse; keep container tightly sealed to prevent moisture absorption, caking and light-induced decomposition; storage temperature ≤ 25℃, relative humidity ≤ 60%.
- **Incompatibilities**: Strong alkalis (NaOH, KOH), oxidizing agents (hydrogen peroxide, chlorine-based disinfectants), alkaline food additives, high-temperature processing equipment (>100℃), direct sunlight.
- **Storage Class (TRGS 510)**: 13 (Non-Hazardous Solids)
- **Shelf Life**: 24 months (unopened, under specified storage conditions); 6 months after opening (seal tightly, store in dark dry environment, use as soon as possible).

SECTION 8: Exposure Controls/Personal Protection

8.1 Control Parameters

No specific occupational exposure limit (OEL) for Thiamine Hydrochloride; follow general food additive dust exposure limits (TWA 10 mg/m³) and national food hygiene operation standards.

8.2 Exposure Controls

- **Engineering Controls**: Local exhaust ventilation (LEV) for large-scale processing; dust collection system to reduce airborne powder concentration; dehumidification and light-proof equipment to maintain storage/processing environment.
- **Personal Protective Equipment (PPE)**:
  - Eye/Face Protection: Safety goggles with side shields (mandatory for bulk handling/mixing to avoid powder splashing into eyes).
  - Skin Protection: Nitrile rubber gloves (food grade, thickness ≥0.11 mm) and clean protective clothing for prolonged contact.
  - Respiratory Protection: FFP1 dust mask for regular handling; FFP2 mask for large-scale spill or fine dust generation.
  - Foot Protection: Non-slip food-grade safety shoes for all handling operations.

- Hygiene: Provide food-grade hand washing facilities with pure water and soap at the workplace; prepare weak alkaline hand sanitizer for post-handling cleaning.

- **Environmental Exposure**: Install dust collection systems; collected dust can be reused (meets food grade quality standards).

SECTION 9: Physical and Chemical Properties

a) Physical State: Crystalline powderb) Color: White to off-whitec) Odor: Odorless, no pungent smelld) Melting Point: 248-250℃ (decomposes)e) Boiling Point: Not applicable (decomposes before boiling)f) Flammability: Non-combustibleg) Flammability Limits: Not applicableh) Flash Point: Not applicablei) Autoignition Temperature: > 300℃j) Decomposition Temperature: ≥ 100℃ (alkaline environment), ≥ 200℃ (neutral/acidic environment)k) pH Value (1% aqueous solution, 25℃): 2.7-3.4l) Viscosity: N/A (solid); 6-10 mPa·s (10% aqueous solution, 25℃)m) Solubility: Freely soluble in water (8.7 g/100 mL at 25℃); slightly soluble in ethanol; insoluble in ether, chloroform and benzenen) Partition Coefficient (log Kow): -1.8 (hydrophilic)o) Vapor Pressure (25℃): Negligible (< 0.0001 hPa)p) Density (25℃, solid): 1.470 g/cm³q) Bulk Density: 0.5-0.8 g/cm³r) Explosive Properties: Not explosives) Oxidizing Properties: Nonet) Hygroscopy: Slightly hygroscopicu) Light Sensitivity: Sensitive to light (decomposes under direct sunlight)

SECTION 10: Stability and Reactivity

10.1 Chemical Stability

Stable under recommended storage/use conditions (≤25℃, dry, dark, sealed); stable in acidic/neutral food system pH (2.0-7.0); decomposes rapidly in alkaline environment and high temperature (>100℃), losing vitamin activity.

10.2 Possibility of Hazardous Reactions

No hazardous reactions under normal use/handling conditions; no polymerization; neutralization reaction occurs with strong alkalis (no toxic by-products, only loss of vitamin activity).

10.3 Conditions to Avoid

High temperature (>100℃), direct contact with strong alkalis/oxidizing agents, prolonged exposure to direct sunlight, high humidity (caking risk), alkaline food processing environment.

10.4 Incompatible Materials

Concentrated mineral alkalis, strong oxidizing agents, high-concentration alkaline food additives, heavy metal salts (high concentration), light-sensitive food processing equipment without protection.

10.5 Hazardous Decomposition Products

No hazardous decomposition products; decomposes into non-toxic organic and inorganic substances in high temperature/alkaline environment; no toxic by-products generated, only loss of nutritional activity.

SECTION 11: Toxicological Information

11.1 Information on Toxicological Effects

- **Acute Toxicity**: Oral (Rat, LD_{50}) > 8,000 mg/kg (practically non-toxic); Dermal (Rabbit, LD_{50}) > 20,000 mg/kg; Inhalation (Rat, LC_{50}) > 10 mg/m³ (4-hour exposure)
- **Skin Corrosion/Irritation**: Mild transient irritation (Rabbit test, 4-hour exposure, food grade); reversible after rinsing.
- **Serious Eye Damage/Irritation**: Mild irritation (Rabbit test, 24-hour exposure; reversible within 24 hours after rinsing).
- **Respiratory/Skin Sensitization**: No sensitizing effects reported in long-term use tests and industrial applications.
- **Germ Cell Mutagenicity**: No mutagenic effects (Ames test, chromosome aberration test).
- **Carcinogenicity**: IARC Class 3 (not classifiable as to its carcinogenicity to humans); recognized as a safe food additive by FDA/FAO/WHO.
- **Reproductive Toxicity**: No adverse reproductive effects in animal tests; essential vitamin for fetal and infant nervous system development.
- **Specific Target Organ Toxicity**: No target organ toxicity; essential water-soluble vitamin for human/animal body, participates in carbohydrate metabolism, nervous system function maintenance and energy synthesis.
- **Aspiration Hazard**: Low (crystalline powder, moderate bulk density, no aspiration risk for humans/animals).

11.2 Additional Information

Thiamine Hydrochloride (Vitamin B1) is an essential water-soluble vitamin, a food additive approved by FAO/WHO/Codex Alimentarius; long-term food, pharmaceutical and feed use data confirm its safety at standard dosages. It is a core nutrient for human energy metabolism and nervous system health, with no toxic side effects at normal intake.

SECTION 12: Ecological Information

12.1 Toxicity

- Fish (Zebrafish, LC_{50}): > 10,000 mg/L (96-hour exposure)
- Daphnia (EC_{50}): > 5000 mg/L (48-hour exposure)
- Algae (EC_{50}): > 10,000 mg/L (72-hour exposure)No toxic effects on aquatic organisms; serves as a nutrient supplement for aquatic microorganisms.

12.2 Persistence and Degradability

Fully biodegradable (BOD_5 /COD > 0.8) in aquatic/soil environments; degraded by microorganisms into small molecular nutrients and inorganic substances within 5-7 days; no residual pollution.

12.3 Bioaccumulative Potential

None; Thiamine Hydrochloride is a water-soluble vitamin, rapidly metabolized and utilized by all organisms; no bioaccumulation in aquatic/terrestrial organisms.

12.4 Mobility in Soil

High mobility (freely soluble in water); readily dissolves in soil water, but rapidly degraded by soil microorganisms; no long-term soil accumulation.

12.5 PBT/vPvB Assessment

Not classified as PBT/vPvB (fully biodegradable, non-toxic, no bioaccumulation).

12.6 Endocrine Disrupting Properties

No endocrine disrupting effects reported in standard tests and long-term food use data.

12.7 Other Adverse Effects

No known adverse ecological impacts; environmentally benign, acts as a microbial nutrient in natural environment.

SECTION 13: Disposal Considerations

13.1 Waste Treatment Methods

- **Product Waste**: Uncontaminated waste can be reused as food/feed additive; contaminated waste can be disposed of as non-hazardous solid waste in accordance with local/national food safety regulations; aqueous waste can be neutralized with weak alkali then treated by biological wastewater treatment systems.
- **Packaging Waste**: Rinse empty containers thoroughly with pure water (rinse water can be used for food/feed preparation if qualified); dispose of rinsed packaging as food-grade non-hazardous waste or recycle (HDPE/paper/light-proof packaging).

13.2 Disposal Notes

Incineration is not recommended (wastes a valuable vitamin nutrient resource); landfilling is acceptable and the product will biodegrade in soil, serving as a nutrient for soil microorganisms; avoid large amounts of spilled powder entering water bodies (no environmental risk, follow food waste disposal standards).

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 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

Transport at ≤ 25℃; use light-proof, sealed and moisture-proof packaging; avoid rain, moisture, direct sunlight and package collision during transport; prevent powder leakage; use pallets for loading to avoid ground contact and contamination.

14.7 Incompatible Materials

Avoid transport with strong alkalis, oxidizing agents, alkaline food additives, toxic/hazardous chemicals and non-food grade materials.

Further Information: Classified as non-dangerous goods under international transport regulations; comply with food additive transport hygiene and safety standards, especially light -proof and temperature control requirements.

SECTION 15: Regulatory Information

15.1 National Regulations (China)

- Hazardous Chemical Safety Management Regulation (Non-hazardous classification)
- National Food Safety Standard for Food Additives (GB 14750-2010)
- GB 2760-2021 (National Food Safety Standard for Use of Food Additives)
- Food Hygiene Law of the People's Republic of China
- National Food Safety Standard for Infant Formula Food (GB 10765/GB 10767)

15.2 International Regulations

- GHS Classification (Rev. 9): Non-hazardous
- REACH (EU): Registered; not listed in SVHC Candidate List; complies with EC 1333/2008 (food additives)
- TSCA (US): Listed on the TSCA Inventory; GRAS certified by FDA (21 CFR 182.5875)
- Codex Alimentarius (FAO/WHO): Approved as food vitamin fortifier (Codex STAN 192-1995)
- EFSA (EU): Evaluated and approved for food use (EFSA Journal 2009; 7(10):1207)

15.3 Other Regulations

Comply with local food safety, environmental protection and transport regulations; follow the maximum addition limit of vitamin fortifiers in food products specified by national and international standards, especially strict compliance with infant and special medical purpose food regulations.

SECTION 16: Other Information

16.1 Further Information

This MSDS is based on current scientific knowledge and complies with GB/T 16483, GB/T 17519, GHS, IMDG and IATA standards. It is intended for the safe handling, storage, transport and disposal of food-grade Thiamine Hydrochloride. The supplier is not liable for any damage caused by improper use, non-compliance with safety precautions or violation of national food additive use standards.

16.2 Revision History

First version (February 26, 2026)