



NEWAY SINOPHC TECH. LIMITED

ADD:RM. 204, BUILDING 3, NO. 188, AONA RD., CHINA (SHANGHAI) PILOT FREE TRADE ZONE.
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Safety Data Sheet (MSDS)

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

Tricalcium Phosphate (Food Grade, Powder)

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

1.1 Product Identifiers

- Product Name: Tricalcium Phosphate (Food Grade, Powder)
- Product Number: TCP-20260220
- Brand: SIGALD
- CAS-No.: 12167-74-7
- Synonyms: TCP; Tribasic calcium phosphate; Calcium phosphate tribasic; 三钙磷酸盐 (食品级)
- EC-No.: 235-330-0

1.2 Details of the supplier of the safety data sheet

- Company: NEWAY SINOPHC TECH. LIMITED
- 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 of the Substance or Mixture and Uses Advised Against

- Identified Uses: Food additive (anti-caking agent, nutritional fortifier, texture modifier, emulsifier) for dairy, bakery, candy, meat, beverage and infant food; pharmaceutical excipient (filler); feed additive (calcium/phosphorus fortifier).
- Uses Advised Against: Not for use in high-acid food systems without stabilization; avoid excessive use beyond national food standard limits for infant food.

SECTION 2: Hazards Identification

| Summary of Emergency Measures | White free-flowing powder. Non-hazardous (mild irritant for sensitive individuals). After inhalation: Move to fresh air, cough gently to expel dust if irritation occurs. In case of skin contact: Rinse skin with plenty of running water for 5 minutes, no special treatment needed. After eye contact: Rinse with plenty of water for 5-10 minutes; consult a doctor if irritation persists. After swallowing: Rinse mouth with water, drink a small amount of warm water; no induced vomiting, no adverse effects for food-grade dosage ingestion. Non-combustible. No explosion risk. | | --- |

2.1 GHS Classification

- Serious eye damage/eye irritation (Category 2)
- Specific target organ toxicity - single exposure (Respiratory tract, Category 3)

2.2 GHS Label Elements

- Hazard Pictogram: (Irritant)
- Signal Word: **Warning**



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- Hazard Statements:
 - H319: Causes serious eye irritation
 - H335: May cause respiratory irritation
- Precautionary Statements:
 - P261: Avoid breathing dust/fumes
 - P264: Wash skin thoroughly after handling
 - P280: Wear protective gloves/eye protection
 - 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
 - P337+P313: If eye irritation persists: Get medical advice/attention

2.3 Physical and Chemical Hazards

Non-combustible, no explosion risk; stable at normal temperature and pressure, decomposes at $\geq 1300^{\circ}\text{C}$ to calcium oxide and phosphorus pentoxide (no hazardous decomposition under food processing conditions); insoluble in water, slightly soluble in dilute acids, insoluble in organic solvents.

2.4 Health Hazards

- Inhalation of dust may cause mild respiratory tract irritation (cough, sore throat) in sensitive individuals, no systemic toxicity; no adverse effects for normal occupational exposure.
- Direct skin contact causes no irritation for most people, mild dryness may occur for sensitive skin with prolonged contact.
- Direct eye contact causes mild to moderate irritation (redness, tearing), reversible after flushing, no permanent eye damage.
- Accidental swallowing of food-grade dosage has no acute toxicity; large amount ingestion may cause mild gastrointestinal discomfort (constipation), no severe adverse effects.

2.5 Environmental Hazards

Environmentally friendly; insoluble in water, no leaching risk; no adverse effects on aquatic/terrestrial organisms at normal use concentration; no bioaccumulation potential; can be used as a calcium/phosphorus supplement for soil when disposed of, no soil pollution.

2.6 Other Hazards

No additional hazards identified; tricalcium phosphate is a natural mineral component, existing in human bones and teeth, compatible with the human body.

SECTION 3: Composition/Information on Ingredients

- Substance / Mixture: Pure substance (inorganic salt)

3.1 Main Components

Formula	Ca ₃ (PO ₄) ₂ (Tricalcium Phosphate)
Molecular Weight	310.18 g/mol
CAS-No.:	12167-74-7
EC-No.:	235-330-0
Concentration (w/w)	≥98.0% (Food Grade, powder)
Other Component	Food-grade anti-caking agent (SiO ₂ , ≤2.0%)

Hazardous Ingredients

Component	Classification	Concentration (w/w)
Tricalcium Phosphate	Eye Irrit. 2, Resp. Irrit. 3	98.0-99.5%
Silicon Dioxide (food-grade)	Non-hazardous	0.5-2.0%
Total Hazardous Ingredients	100%	98.0-99.5%

SECTION 4: First Aid Measures

4.1 Description of First-Aid Measures

- If Inhaled: Move victim to fresh air and rest in a comfortable breathing position. Loosen tight clothing. If cough or sore throat persists, drink warm water and consult a doctor if needed; no special treatment required for mild irritation.
- In Case of Skin Contact: Immediately rinse skin with plenty of running water and mild soap for 5 minutes if prolonged contact occurs. Remove contaminated clothing/shoes; wash clothing before reuse. Apply moisturizer if skin dryness occurs.
- In Case of Eye Contact: Hold eyes open and rinse thoroughly with plenty of running water (from inner to outer corner) for 5-10 minutes. Do not rub eyes. Remove contact lenses if present (after initial rinsing). Consult an ophthalmologist only if irritation persists for more than 1 hour.
- If Swallowed: Rinse mouth with clean water. Drink 200-300 mL warm water or milk to dilute. Do not induce vomiting (no choking risk for powder). Consult a doctor only if mild gastrointestinal discomfort (constipation, abdominal pain) occurs; food-grade dosage requires no medical treatment.

4.2 Most Important Symptoms and Effects, Both Acute and Delayed

- Acute Effects: Mild respiratory irritation from dust inhalation, mild eye irritation, mild gastrointestinal discomfort from large amount ingestion.
- Delayed Effects: No known delayed toxic effects based on long-term human/animal use data; no cumulative toxicity.

4.3 Indication of Any Immediate Medical Attention and Special Treatment Needed

No specific antidote; treat symptomatically (e.g., eye drops for mild eye irritation, laxatives for constipation from large amount ingestion). No special medical treatment required for normal exposure/ingestion.

4.4 Notes to Physician

Inform the physician of the product composition (inorganic calcium phosphate salt) and exposure/ingestion dosage; no specific treatment protocol needed, supportive care is sufficient.

SECTION 5: Firefighting Measures

5.1 Extinguishing Media

- Suitable Extinguishing Media: Water spray, carbon dioxide (CO₂), dry chemical powder, foam.
- Unsuitable Extinguishing Media: No limitations of extinguishing agents.

5.2 Special Hazards Arising from the Substance or Mixture

- Non-combustible; no flame or smoke during combustion (if involved in fire); decomposes only at extremely high temperature ($\geq 1300^{\circ}\text{C}$) with no toxic/hazardous combustion products under normal fire conditions.
- Dust cloud may cause mild respiratory irritation to firefighters; no dust explosion risk (no combustible components).

5.3 Advice for Firefighters

- Wear standard fire-fighting gear (gloves, goggles, dust respirator) to avoid inhalation of dust and skin/eye contact with hot powder.
- Cool containers with water spray to prevent overheating and caking; keep a safe distance from spilled powder.
- Ensure good ventilation at fire scene to disperse dust.

SECTION 6: Accidental Release Measures

6.1 Personal Precautions, Protective Equipment and Emergency Procedures

- Wear nitrile rubber gloves, chemical protective goggles and FFP1 respirator (for dust) when cleaning up spills.
- Evacuate non-essential personnel from the spill area; ensure good ventilation to disperse dust cloud.
- Do not touch or walk through the spilled powder directly; avoid breathing dust.

6.2 Environmental Precautions

- Prevent spilled powder from entering sewers, rivers, lakes or other water bodies (insoluble, no pollution; avoid excessive accumulation that may cause sedimentation).
- Sweep up spilled powder on soil and transfer to sealed containers; no special environmental treatment needed, residual powder can be naturally integrated into soil.

6.3 Methods and Materials for Containment and Cleaning Up

- Small Spill: Sweep up with a clean dry brush, transfer to a sealed HDPE plastic bag/container for reuse or disposal; wipe the area with a dry cloth to remove residual dust.
- Large Spill: Contain with plastic barriers; sweep up the powder with a dust pan, transfer to sealed HDPE drums for recycling or disposal; rinse the area with a small amount of water (avoid excessive water to prevent hardening).

6.4 Reference to Other Sections

For disposal, see Section 13.

SECTION 7: Handling and Storage

7.1 Precautions for Safe Handling

- Operate in a well-ventilated area with local exhaust ventilation (to capture dust); use dry powder handling equipment (avoid moisture) to prevent caking and hardening.
- Wear personal protective equipment (PPE) as specified in Section 8; wash hands/face thoroughly with soap and water after handling; do not eat, drink or smoke in the workplace.
- Avoid contact with strong acids (e.g., hydrochloric acid, lactic acid) in large amounts (reacts to produce calcium salt and phosphoric acid); mix evenly with food raw materials to ensure uniform distribution in food systems.
- Use dry, clean stainless steel/HDPE equipment for handling; avoid iron/copper equipment (no reaction, just to prevent contamination).

7.2 Conditions for Safe Storage, Including Any Incompatibilities

- **Storage Conditions:** Store in a **cool, dry, well-ventilated** food-grade warehouse. Keep container tightly sealed to prevent moisture absorption, caking and hardening. Storage temperature $\leq 30^{\circ}\text{C}$, relative humidity (RH) $\leq 60\%$; avoid direct sunlight and damp environment.
- **Incompatibilities:** Strong acids (HCl, H_2SO_4 , lactic acid), strong acid food additives (citric acid, malic acid in high concentration), water with high acidity (pH < 3.0).
- **Storage Class (TRGS 510):** 13 (Non-Hazardous Solids)
- **Shelf Life:** 36 months (unopened, under specified storage conditions); 6 months (after opening, sealed and dry storage).
- **Packaging Requirements:** Store in food-grade sealed HDPE plastic drums/paper composite bags (airtight, moisture-proof); inner lining with plastic film is recommended for paper bags.

SECTION 8: Exposure Controls/Personal Protection

8.1 Control Parameters

表格

Component	CAS-No.	TLV-TWA (8h)	TLV-STEL (15min)	Basis
Tricalcium Phosphate	12167-74-7	10 mg/m ³ (total dust)	20 mg/m ³ (total dust)	ACGIH (inorganic dust)

8.2 Exposure Controls

- **Engineering Controls:** Install local exhaust ventilation at the operation station (capture efficiency $\geq 90\%$) to reduce dust concentration; use closed-loop powder transfer systems for bulk handling.
- **Personal Protective Equipment (PPE):**
 - Eye/Face Protection: Chemical protective goggles (mandatory for all handling) to prevent dust from entering eyes.
 - Skin Protection: Nitrile rubber gloves (thickness $\geq 0.15\text{mm}$), clean cotton work clothes; no special protective clothing required for short-term handling.

- Respiratory Protection: FFP1 respirator for normal handling; FFP2 respirator for bulk handling/dust generation.
- Hand Protection: Replace gloves if damaged/contaminated; wash gloves before removal.
- **Control of Environmental Exposure:** Do not discharge powder into the environment; collect and reuse/dispose of spilled powder.

SECTION 9: Physical and Chemical Properties

9.1 Information on Basic Physical and Chemical Properties

a) Physical State: Solid (powder) b) Color: White to off-white c) Odor: Odorless d) Melting Point/Freezing Point: 1670°C (decomposes before melting) e) Initial Boiling Point and Boiling Range: Not applicable (solid, decomposes on heating) f) Flammability (Solid/Gas): Non-combustible g) Upper/Lower Flammability or Explosive Limits: Not applicable h) Flash Point: Not applicable i) Autoignition Temperature: Not applicable j) Decomposition Temperature: ≥1300°C (decomposes to CaO and P₂O₅) k) pH Value (25°C): 7.0-8.5 (5% aqueous suspension) l) Viscosity (25°C): Not applicable (powder) m) Water Solubility: Insoluble in water (≤0.002 g/100 mL at 25°C) n) Partition Coefficient (n-octanol/water): Not applicable (insoluble in both) o) Vapor Pressure (25°C): Negligible (<0.0001 hPa) p) Density (25°C): 3.14 g/cm³ (true density); 0.8-1.2 g/cm³ (bulk density) q) Bulk Density: 0.8-1.2 g/cm³ r) Particle Characteristics: 80-200 mesh (uniform fine powder) s) Explosive Properties: Not explosive (no dust explosion risk) t) Oxidizing Properties: None (inert inorganic salt)

9.2 Other Safety Information

Slightly hygroscopic (easily absorbs moisture and cakes in damp environment); insoluble in ethanol, ether and other organic solvents; slightly soluble in dilute acids (acetic acid, lactic acid); stable in neutral and alkaline food systems; compatible with most food additives (antioxidants, thickeners, sweeteners).

SECTION 10: Stability and Reactivity

10.1 Chemical Stability

Stable under recommended storage and food use conditions (≤30°C, dry, sealed); no spontaneous reaction with air/water at room temperature; stable in all food processing conditions (pasteurization, boiling, freezing).

10.2 Possibility of Hazardous Reactions

- No hazardous reactions under normal use/handling conditions; reacts with strong acids to produce soluble calcium salt and phosphoric acid (mild reaction, no exotherm or splashing).
- Decomposes only at extremely high temperature (≥1300°C) with no toxic products; no polymerization, no hydrolysis under normal conditions.

10.3 Conditions to Avoid

High humidity (RH >60%), direct contact with strong acids, damp storage environment, prolonged exposure to water (caking).

10.4 Incompatible Materials

- Strong acids: Hydrochloric acid, sulfuric acid, nitric acid, concentrated lactic acid/citric acid.
- High-acid food additives: Concentrated malic acid, tartaric acid, phosphoric acid (in high concentration).
- Acidic water (pH <3.0) and high-acid food systems (unstable without stabilization).

10.5 Hazardous Decomposition Products

Only decomposes at $\geq 1300^{\circ}\text{C}$ to calcium oxide (CaO) and phosphorus pentoxide (P_2O_5); no toxic or hazardous decomposition products under normal storage and food processing conditions.

SECTION 11: Toxicological Information

11.1 Information on Toxicological Effects

- **Acute Toxicity:**
 - Oral (Rat, LD_{50}): > 50000 mg/kg
 - Dermal (Rabbit, LD_{50}): > 20000 mg/kg
 - Inhalation (Rat, LC_{50}): > 10000 mg/ m^3 (4-hour exposure, dust)
- **Skin Corrosion/Irritation:** No irritation (Rabbit test, 4-hour exposure); no redness, no corrosion, no adverse effects.
- **Serious Eye Damage/Eye Irritation:** Mild to moderate irritation (Rabbit test, 24-hour exposure); redness/tearing, reversible within 48 hours, no corneal damage.
- **Respiratory or Skin Sensitization:** No skin/respiratory sensitization (long-term human/animal use data; patch test negative).
- **Germ Cell Mutagenicity:** No mutagenic effects (Ames test, chromosome aberration test); negative results for all genetic toxicity tests.
- **Carcinogenicity:** Not classified as carcinogenic by IARC, EPA, or NTP; FDA/CFDA GRAS certified (food grade).
- **Reproductive Toxicity:** No adverse reproductive/developmental effects in animal tests (rat/mouse) at high dosage (5000 mg/kg/day); no teratogenic, embryotoxic or fetotoxic effects, can be used as calcium/phosphorus fortifier for pregnant and lactating women food.
- **Specific Target Organ Toxicity (Single/Repeated Exposure):** No target organ toxicity for single/repeated exposure; no cumulative toxicity in long-term animal tests.
- **Aspiration Hazard:** Low (powder, moderate bulk density; no aspiration risk for normal handling, avoid inhaling large amounts of dust).

11.2 Additional Information

Approved by FAO/WHO Codex Alimentarius, **ADI: Not specified (no limitation)**; tricalcium phosphate is an essential calcium and phosphorus source for the human body, a natural component of bones and teeth, safe for long-term human consumption in compliance with GB 2760-2021 dosage standards, and can be used in infant food (0-36 months) with specified limits.

SECTION 12: Ecological Information

12.1 Toxicity

- Fish (Zebrafish, LC₅₀): > 10000 mg/L (96-hour exposure, water suspension)
- Daphnia (EC₅₀): > 8000 mg/L (48-hour exposure, water suspension)
- Algae (EC₅₀): > 10000 mg/L (72-hour exposure, water suspension)
- Soil Microorganisms: No inhibitory effect at any concentration; can be used as a calcium/phosphorus fertilizer supplement for soil.No toxic effects on aquatic/terrestrial organisms at any concentration related to food use; insoluble in water, no bioavailability for aquatic organisms.

12.2 Persistence and Degradability

Inorganic substance, non-biodegradable; insoluble in water, no migration in the environment; no persistent organic pollutants (POPs); when disposed of in soil, it can be slowly dissolved by soil acid and absorbed by plants as calcium/phosphorus nutrient, no environmental accumulation.

12.3 Bioaccumulative Potential

No bioaccumulation potential; insoluble in water and organic solvents, cannot be absorbed by organisms, no accumulation in tissues/organs of aquatic/terrestrial animals.

12.4 Mobility in Soil

Low mobility in soil; adsorbs to soil organic matter and clay particles, slowly dissolves in acidic soil; no leaching into groundwater (no groundwater contamination risk).

12.5 Results of PBT and vPvB Assessment

Not classified as PBT/vPvB (no persistence in bioavailable form, no bioaccumulation, no toxicity); environmentally friendly inorganic food additive.

12.6 Other Adverse Effects

No known adverse ecological impacts; no effect on water quality, soil fertility or biodiversity; can improve soil calcium/phosphorus content when disposed of, with a certain soil improvement effect.

SECTION 13: Disposal Considerations

13.1 Waste Treatment Methods

- **Product Waste:** Uncontaminated powder can be reused for food processing (if within shelf life); expired powder can be mixed with animal feed (calcium/phosphorus fortifier) or disposed of as non-hazardous solid waste by licensed facilities; no special treatment required.
- **Packaging Waste:** Rinse packaging thoroughly with water to remove residual powder; dispose of as non-hazardous food-grade packaging waste or recycle (HDPE/paper).
- **Dust Waste:** Collect all dust waste, transfer to sealed containers, and dispose of as non-hazardous solid waste or reuse.

13.2 Disposal Notes

- Do not mix with strong acid waste (mild reaction, no hazardous products); no open burning of powder (unnecessary, inorganic substance with no combustion value).

- Comply with local, national and international waste disposal regulations (e.g., China GB 8978, EU WFD, US EPA); food-grade waste shall be disposed of in accordance with food safety regulations.

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 $\leq 30^{\circ}\text{C}$; use moisture-proof, airtight packaging (HDPE drums/paper composite bags); avoid direct sunlight, rain and damp environment during transport.
- Avoid collision, extrusion and packaging damage to prevent powder caking and hardening; use pallets for stacking, the maximum stacking height of drums shall not exceed 5 layers.
- Do not transport with strong acids, high-acid food additives and acidic cargoes (separate loading); can be transported with other food additives (compatible with most).
- Ensure good ventilation in the transport vehicle; no smoking/open fire in the vehicle; carry a small amount of PPE for emergency cleaning of spilled powder.

14.7 Incompatible Materials

Avoid transport with strong acids, concentrated acidic food additives and acidic cargoes (pH <3.0).

Further Information: Not classified as dangerous goods under international transport regulations (ADR/RID, IMDG Code, IATA-DGR); transport as ordinary food additive, dry transport is recommended for best quality retention.

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)
 - National Food Safety Standard for Food Additives (GB 2760-2021) – approved as anti-caking agent/nutritional fortifier/texture modifier (specified application scope and dosage for infant food)

- National Food Safety Standard for Tricalcium Phosphate (GB 1886.31-2021) – strict quality requirements for food grade
- Food Safety Law of the People's Republic of China
- Environmental Protection Law
- **International Regulations:**
 - GHS Classification (Rev. 9): Eye Irrit. 2, STOT-single 3 (Resp. tract)
 - REACH (EU): Registered; not in SVHC Candidate List; complies with EC 1333/2008 (food grade)
 - TSCA (US): Listed on the TSCA Inventory; FDA GRAS certified (21 CFR 182.1217)
 - Codex Alimentarius (FAO/WHO): Approved as food additive (ADI: not specified)
 - FCC (Food Chemicals Codex): Grade V compliance

15.2 Other Regulations

Comply with local food safety, occupational health and environmental protection regulations; the workplace must meet the occupational exposure limit of inorganic dust; food use must follow GB 2760-2021 application scope and dosage limit (specified limits for infant food 0-36 months).

SECTION 16: Other Information

- **Further Information:** This MSDS is based on current scientific knowledge and complies with GB/T 16483, GB/T 17519, and GHS standards. It is intended for safe handling, storage, transport, and disposal of food-grade Tricalcium Phosphate (powder). The supplier is not liable for damage caused by improper use, storage or non-compliance with safety precautions.
- **Revision Date:** 20 FEB 2026
- **Version:** V1.0