

Technical Data Sheet (TDS)

Tricalcium Phosphate (Food Grade, Powder)

1. Product Overview

- Product Name: Tricalcium Phosphate (Food Grade, Powder)
- English Name: Tricalcium Phosphate
- CAS Number: 12167-74-7
- Formula: $\text{Ca}_3(\text{PO}_4)_2$
- Molecular Weight: 310.18 g/mol
- **Product Characteristics:** Food-grade Tricalcium Phosphate (TCP) is an odorless white free-flowing inorganic powder, a multifunctional food additive with high purity ($\geq 98.0\%$). It is an essential calcium and phosphorus source for the human body, existing naturally in bones and teeth. As a food additive, it has the functions of anti-caking, nutritional fortification, texture modification and emulsification; it can prevent food caking, supplement calcium and phosphorus nutrients for food, improve food texture and stability, and extend food shelf life. Insoluble in water, stable in most food systems, compliant with GB 2760-2021, FDA, FAO/WHO and EU food safety standards, and is widely used in the global food industry, including infant food and functional food.

2. Technical Specifications (Complies with GB 1886.31-2021 / FCC / FAO/WHO)

Item	Specification (Food Grade, Powder)
Appearance	White to off-white free-flowing powder, no caking
Assay ($\text{Ca}_3(\text{PO}_4)_2$)	$\geq 98.0\%$
Calcium (Ca) Content	34.0-38.0%
Phosphorus (P) Content	18.0-21.0%
pH Value (25°C, 5% suspension)	7.0-8.5
Heavy Metals (Pb)	≤ 0.5 ppm
Arsenic (As)	≤ 0.1 ppm
Fluoride (F)	≤ 50 ppm
Loss on Drying (105°C)	$\leq 2.0\%$
Residue on Ignition	95.0-100.5%
Total Bacterial Count	≤ 100 CFU/g
E. coli	Negative
Salmonella	Negative
Particle Size	80-200 mesh (uniform fine powder)
Bulk Density	0.8-1.2 g/cm ³
Water Solubility	Insoluble in water (≤ 0.002 g/100 mL)
Acid Solubility	Slightly soluble in dilute acids (lactic/citric acid)
Temperature Stability	Stable at -20°C ~ 121°C (all food processing conditions)

3. Product Advantages

1. **Natural & Safe:** Inorganic mineral salt, natural component of human body, no toxic side effects at food dosage; FAO/WHO ADI not specified, no intake limitation; can be used in infant food.
2. **Multifunctional:** Integrates anti-caking, calcium/phosphorus nutritional fortification, texture modification and emulsification functions; one product for multiple uses, reducing the use of other food additives.
3. **High Stability:** Stable in all food processing conditions (pasteurization, boiling, freezing, sterilization); no decomposition, no loss of activity, compatible with neutral and alkaline food systems.
4. **Excellent Anti-caking Effect:** Prevents food powder/crystalline products from caking and agglomeration, improves food fluidity and appearance, extends food shelf life.
5. **Ideal Nutritional Fortifier:** Optimal calcium-phosphorus ratio (about 1.8:1), close to human bone ratio, easy to be absorbed by the human body; suitable for calcium/phosphorus fortification of dairy, cereal and infant food.

6. **Good Texture Modification:** Improves food texture and mouthfeel, enhances the stability of emulsified food systems, prevents water separation and oil separation of food.
7. **Environmentally Friendly:** Inorganic substance, no bioaccumulation, no environmental pollution; expired powder can be used as feed additive or soil calcium/phosphorus supplement.

4. Application Fields

Food-grade Tricalcium Phosphate is a multifunctional food additive (specified dosage limit for infant food in GB 2760-2021), suitable for **various food and beverage processing**; also used in pharmaceuticals and feed:

- **Dairy Industry:** Milk powder, yogurt, cheese, condensed milk, milk beverage; anti-caking agent, calcium/phosphorus fortifier, texture modifier; prevents milk powder caking, supplements nutrients.
- **Bakery & Cereal Industry:** Bread, cake, biscuit, cereal powder, instant noodles; anti-caking agent, texture modifier; improves dough stability and food mouthfeel.
- **Candy & Snack Industry:** Hard candy, soft candy, chocolate, potato chips, nut products; anti-caking agent, emulsifier; prevents caking, improves product shape and texture.
- **Meat & Seafood Industry:** Ham, sausage, frozen meat, surimi products; texture modifier, water-retaining agent; improves meat tenderness and water retention, enhances product elasticity.
- **Infant & Functional Food:** Infant formula milk powder, rice flour, calcium supplement food, health food; calcium/phosphorus nutritional fortifier (complies with specified dosage limits).
- **Beverage Industry:** Protein beverage, sports beverage, plant beverage; nutritional fortifier, stabilizer; supplements calcium/phosphorus, improves beverage system stability.
- **Other Fields:** Pharmaceutical excipient (filler for tablets/capsules); feed additive (calcium/phosphorus fortifier for livestock/poultry/aquatic feed).

5. Usage Methods

Food Type	Recommended Dosage	Main Function
Milk Powder/Cereal Powder	0.5-2.0%	Anti-caking agent, nutritional fortifier
Yogurt/Cheese/Dairy Beverage	0.3-1.0%	Texture modifier, nutritional fortifier
Bread/Cake/Biscuit	0.2-0.8%	Anti-caking agent, texture modifier
Candy/Chocolate/Snacks	0.5-3.0%	Anti-caking agent, emulsifier
Meat/Seafood Products	0.3-1.5%	Texture modifier, water-retaining agent
Infant Formula Milk Powder/Rice Flour	0.2-0.8% (specified limit)	Calcium/phosphorus nutritional fortifier
Protein/Sports Beverage	0.1-0.5%	Nutritional fortifier, stabilizer

6. Packaging & Storage

- **Small Batch:** 500 g/1 kg/5 kg food-grade HDPE plastic drums (small-scale food processing/retail)
- **Standard Batch:** 10 kg/25 kg food-grade paper composite bags with plastic inner lining (medium-scale food production)
- **Bulk Batch:** 50 kg/100 kg food-grade HDPE plastic drums/ton bags (large-scale food production/export)
- **Custom Packaging:** Available upon request (according to customer's processing and dosage requirements)

7. Safety & Protection

- The product is non-toxic and mild eye/respiratory irritant; wear nitrile rubber gloves and chemical protective goggles during handling to avoid dust entering eyes and direct contact with large amounts of powder.
- Wear FFP1/FFP2 respirator during bulk handling/powder mixing to prevent inhalation of dust and mild respiratory irritation.
- In case of eye contact: Rinse with plenty of running water for 5-10 minutes; consult a doctor only if irritation persists.
- In case of skin contact: Rinse with water and mild soap for 5 minutes if prolonged contact occurs; apply moisturizer if skin dryness occurs.