

Technical Data Sheet (TDS)

- Calcium Propionate (Food Grade)

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1. Product Overview

- **Product Name:** Calcium Propionate (Food Grade)
- **CAS Number:** 4075-81-4
- **EINECS/EC Number:** 223-795-8
- **Chemical Formula:** C₆ H₁₀ CaO₄
- **Molecular Weight:** 186.22
- **Product Characteristics:** High-purity food-grade calcium propionate produced by chemical synthesis and crystallization purification; white free-flowing crystalline powder, slightly hygroscopic, highly soluble in water, with a slight characteristic odor. As a **broad-spectrum food preservative and mold inhibitor**, it inhibits the growth of mold, yeast and harmful bacteria (e.g., Clostridium botulinum) by inhibiting microbial cell metabolism and enzyme activity, extending food shelf life without affecting food flavor, color or texture. It is an organic calcium salt, metabolizes to natural substances in the human body, and is also a mild calcium supplement. FDA GRAS/EC E282 certified; compliant with GB 1886.21-2016/GB 2760/FDA/EC/CAC standards, the most widely used mold inhibitor in bakery and cereal food production.
- **Core Application:** Food additive (preservative, mold inhibitor, antiseptic) for bakery, pastry, bread, cake, cereal, dairy, processed meat, condiment, beverage and canned food industries; also used as feed preservative (food-grade derivative).

2. Technical Specifications (Compliant with GB 1886.21-2016 & FCC/USP)

Item	Standard Requirement
Appearance	White crystalline powder, free-flowing, no caking
Odor/Taste	Slight characteristic odor, slightly salty, no off-taste
Assay (Calcium Propionate, dry basis)	≥98.0%
Loss on Drying (105°C, 2h)	≤1.0%
pH Value (5% aqueous solution, 25°C)	7.0-9.5
Chloride (as Cl ⁻)	≤0.01%
Sulfate (as SO ₄ ²⁻)	≤0.01%
Heavy Metals (as Pb)	≤1 ppm
Arsenic (As)	≤0.5 ppm
Iron (Fe)	≤5 ppm
Calcium Oxide (CaO)	≤1.0%
Reducing Substances	Passes test
Water Solubility	≥30 g/100mL (25°C)
Total Bacterial Count	≤100 CFU/g
Yeast & Mold	≤10 CFU/g
E. coli	Negative in 1g
Salmonella	Negative in 25g
Temperature Stability	Stable at 0-120°C (food processing temperature); decomposes >300°C
pH Stability	Stable in neutral/alkaline systems (pH 6.0-10.0)
Storage Stability	24 months (unopened), 6 months after opening

3. Product Advantages

1. **Broad-Spectrum Antimicrobial:** Inhibits mold, yeast and harmful bacteria; effective for most food spoilage microorganisms, suitable for various food systems.



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2. **High Safety:** Metabolizes to propionic acid (natural fatty acid) and calcium ions; no residual, no toxic by-products, approved by all international food safety authorities.
3. **No Impact on Food Quality:** Does not affect food flavor, color, texture or nutritional value; suitable for high-temperature processing (baking, boiling, sterilization).
4. **Excellent Solubility:** Highly soluble in water (35g/100mL at 25°C); dissolves quickly in cold/hot water, uniform dispersion in food system, no precipitation.

4. Application Fields & Recommended Dosage

(Adjust dosage according to food type, storage conditions and shelf life requirement; all dosages are w/w based on food raw materials, comply with GB 2760/FDA/EC GMP dosage limits.)

Application Field	Typical Products	Recommended Dosage	Core Effect
Bakery & Pastry	Bread, cake, biscuit, steamed bun, moon cake	0.1-0.5%	Inhibit mold/yeast, extend shelf life, prevent mildew
Cereal Food	Oatmeal, nutritional powder, cereal snack, baby food	0.05-0.3%	Mold inhibition, antiseptic, maintain product stability
Dairy Products	Yogurt, cheese, milk powder, dairy beverage	0.05-0.2%	Inhibit yeast/mold, prevent spoilage, extend shelf life
Processed Meat	Ham, sausage, bacon, preserved meat	0.1-0.4%	Inhibit harmful bacteria/mold, maintain meat quality
Condiment & Sauce	Soy sauce, vinegar, salad dressing, compound seasoning	0.05-0.2%	Antiseptic, prevent mold growth, extend shelf life
Canned Food	Canned fruit/vegetable/meat, preserved food	0.05-0.3%	Mold/bacteria inhibition, prevent spoilage during storage
Beverage	Fruit juice, plant beverage, sports drink	0.02-0.1%	Antiseptic, inhibit yeast/mold, improve storage stability
Other Food	Candy, jelly, snack food, frozen food	0.05-0.3%	Mold inhibition, extend shelf life, maintain product quality

5. Usage Methods & Formulation Guidelines

Key Tip: Calcium propionate is highly soluble in water, suitable for aqueous dissolution or dry mixing; add at the early stage of food processing for uniform dispersion; avoid mixing with strong acids to prevent propionic acid release.

1. **Aqueous Dissolution Method (Liquid/Semi-Solid Food):** Dissolve calcium propionate powder in food-grade water (cold/hot) at a ratio of 1:2 (powder:water); stir to complete dissolution, then add to beverage, sauce, dairy or dough and mix evenly; ensure uniform dispersion in food system.

6. Packaging, Storage & Transportation

- **Small Packaging:** 1 kg/5 kg food-grade sealed paper bags with inner PE liner (for small food factories and bakery use)
- **Standard Packaging:** 25 kg food-grade HDPE plastic drums or paper bags (inner PE liner, sealed cover; for industrial batch production)
- **Bulk Packaging:** 500 kg/1000 kg food-grade jumbo bags (moisture-proof film, inner PE liner; for large food factories with bulk handling)

7. Quality Assurance & Technical Support

1. **Production Standards:** Manufactured in a GMP/HACCP-compliant food-grade production workshop; adopts advanced chemical synthesis and crystallization purification technology (no chemical solvents/additives); meets ISO 9001 (Quality Management) and ISO 22000 (Food Safety) standards; assay ≥98.0%, high purity and stable antimicrobial performance.
2. **Batch Testing:** Every batch of calcium propionate is subject to **strict multi-index testing** (physical, chemical, microbiological, purity, heavy metals, antimicrobial activity); a detailed Certificate of Analysis (COA) is provided with each shipment to ensure compliance with GB 1886.21-2016/FCC/USP standards.