

Technical Data Sheet (TDS)

1. Product Overview

Product Name: Calcium Ascorbate **CAS Number:** 5743-28-2 **Molecular Formula:**

$C_{12}H_{14}CaO_{12} \cdot 2H_2O$ **Molecular Weight:** 426.35 g/mol **Product Characteristics:** A water-soluble calcium salt of L-ascorbic acid (Vitamin C), a stable derivative of Vitamin C with dual nutritional functions of Vitamin C supplementation and calcium fortification. It is a white to pale yellow crystalline powder, odorless, with a slightly sour and sweet taste, soluble in water and slightly soluble in ethanol. It has strong antioxidant activity, is more stable in aqueous solution than free ascorbic acid, and is non-toxic and non-irritating. The product has high bioavailability, can scavenge free radicals, enhance immune function, and supplement essential calcium for the human and animal body, and is widely used in food, pharmaceutical, cosmetic and feed industries.

2. Technical Specifications

Appearance: White to pale yellow crystalline powder **Assay (Iodometric Titration):** $\geq 98.0\%$ **Calcium Content:** 9.0-10.5% **Loss on Drying (105°C):** $\leq 10.0\%$ **Residue on Ignition (800±25°C):** 18.0-20.0% **Heavy Metals (Pb):** ≤ 5 ppm **Arsenic (As):** ≤ 1 ppm **Iron (Fe):** ≤ 10 ppm **pH Value (5% aqueous solution, 25°C):** 6.0-7.5 **Solubility:** Soluble in water (≈ 62 g/100 mL, 25°C); slightly soluble in ethanol; insoluble in chloroform/ether **Storage Stability:** 24 months at room temperature (sealed, dry); 36 months at 2-8°C (sealed, dark) **Hygroscopy:** Slightly hygroscopic **Antioxidant Activity:** Retains $\geq 90\%$ activity after 6 months of storage at 25°C

3. Product Advantages

- Dual Nutritional Value:** Integrates the biological effects of Vitamin C and calcium, realizing simultaneous supplementation of two essential nutrients, with high bioavailability for both human and animal absorption.
- High Stability:** Significantly more stable than free ascorbic acid in aqueous solution and high-temperature processing, not easy to oxidize and decompose, and maintains antioxidant activity for a long time.
- Mild Property:** Neutral pH value, non-acidic, no irritation to the stomach and intestines, suitable for long-term supplementation and application in acidic-sensitive formulations.
- Ultra-Low Impurities:** Strict control of heavy metals and harmful substances, meeting FCC, USP, EP and national food and pharmaceutical grade standards.
- Good Compatibility:** Compatible with most food, pharmaceutical and cosmetic raw materials, no adverse reactions, easy to formulate and process.

4. Application Fields

- Food Industry:** Nutritional fortifier and antioxidant for beverages, dairy products, baked goods, meat products, fruit and vegetable preserves, candies; prolongs food shelf life and enhances nutritional value.
- Pharmaceutical Industry:** Raw material for Vitamin C and calcium supplement preparations (tablets, capsules, oral liquids); antioxidant and immune-enhancing auxiliary material for pharmaceutical formulations.
- Cosmetic Industry:** Antioxidant, whitening and anti-aging additive for skin care products (toner, serum, cream, mask); scavenges free radicals, inhibits melanin formation, and improves skin texture.
- Feed Industry:** Immunity enhancer and nutritional fortifier for livestock, poultry and aquatic feed; improves animal disease resistance, growth performance and product quality.



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- **Other Fields:** Antioxidant for fine chemicals, metal ion chelating agent, and antioxidant additive for water treatment.

5. Usage Methods

- **Food Additive:** Add directly to raw materials, recommended addition amount 0.05-0.5% (by weight); dissolve in water first for beverage production, stir evenly to dissolve completely.
- **Pharmaceutical Formulation:** Mix with excipients according to formulation requirements to prepare solid or liquid preparations; adult daily recommended dosage 500-1000 mg (calculated as pure calcium ascorbate).
- **Cosmetic Formulation:** Dissolve in deionized water (5-20 mg/mL) first, then add to the cosmetic system, adjust pH to 5.0-7.0 for better stability; recommended addition amount 0.1-1.0%.
- **Feed Additive:** Mix evenly with feed raw materials, recommended addition amount 0.02-0.2% for livestock and poultry, 0.05-0.3% for aquatic products. **Note:** Avoid mixing with strong oxidizing agents and heavy metal ions; seal immediately after use to prevent moisture absorption and oxidation.

6. Packaging & Storage

Packaging Specifications:

- 1 kg/bag (food-grade aluminum foil bag with inner PE bag)
- 5 kg/bag (food-grade aluminum foil bag with inner PE bag)
- 25 kg/drum (food-grade HDPE drum with inner PE bag)
- Custom small-volume packaging available for R&D and trial production

Storage Conditions:

- Store in a cool, dry, well-ventilated warehouse, temperature $\leq 25^{\circ}\text{C}$, relative humidity $\leq 60\%$;
- Keep the container tightly sealed, avoid direct sunlight, moisture and contact with air;
- Store separately from strong oxidizing agents, acids, alkalis and toxic/harmful substances; food grade products are stored in a dedicated food additive area to avoid cross-contamination.

Shelf Life: 24 months (unopened, room temperature storage); 36 months (unopened, 2-8°C refrigerated storage); 6 months after opening (sealed, dry storage). **Transportation:** Non-hazardous goods, transported by ordinary dry means; avoid collision, moisture, sunlight and high temperature during transportation to prevent packaging damage.

7. Safety & Protection

The product is food-grade safe, non-toxic and non-irritating, and no special protective measures are required for routine handling. For large-scale powder handling, wear nitrile rubber gloves and a dust mask to avoid dust inhalation and moisture absorption on hands; in case of skin contact, rinse with plenty of water; in case of eye contact, rinse with running water for 5-10 minutes; accidental excessive ingestion may cause mild gastrointestinal discomfort, and drinking more water can promote excretion, and seek medical advice if necessary.

8. Quality Assurance

The product is produced in accordance with ISO 9001 quality management system, ISO 22000 food safety management system and GMP pharmaceutical production standards; food, pharmaceutical and feed grade products are produced in separate production lines to avoid cross-contamination; each batch of products is fully tested by an independent QA laboratory and accompanied by a Certificate of Analysis to ensure compliance with international and national standards; professional technical support is provided for product application, including formulation optimization, dosage adjustment and compatibility test advice.