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Technical Data Sheet (TDS)

Issue Date: 27 FEB 2026**Product Name:** Citric Acid (Food Grade, Anhydrous)**CAS Number:** 77-92-9

1. Product Overview

- **English Name**: Citric Acid (Food Grade, Anhydrous)
- **Chinese Name**: 柠檬酸（无水食品级）
- **CAS No.**: 77-92-9
- **Molecular Formula**: $C_6H_8O_7$
- **Molecular Weight**: 192.12 g/mol
- **Source**: Synthesized by food-grade microbial fermentation (Aspergillus niger) using corn starch as raw material, followed by high-purity refinement; complies with food safety production standards and infant food raw material requirements.
- **Product Characteristics**: White free-flowing crystalline powder, odorless, strong sour taste; natural tricarboxylic acid widely present in citrus fruits; core food additive with multi-functional properties (acidulant, flavor enhancer, preservative, chelating agent); freely soluble in water, stable in food processing environments; non-toxic at standard dosages, fully biodegradable, meets national/international food safety standards, suitable for various food and beverage production.

2. Technical Specifications (Complies with Food Industry Standard GB 2760-2021)

Item	Specification (Food Grade)
Appearance	White to off-white free-flowing crystalline powder
Assay (Citric Acid, Titration)	≥ 99.5%
Melting Point	153-159℃
pH Value (25℃, 1% aqueous solution)	2.0-2.5
Loss on Drying (105℃, 2h)	≤ 0.5%
Ash Content	≤ 0.05%
Chloride (as Cl^-)	≤ 0.005%
Sulfate (as SO_4^{2-})	≤ 0.005%
Density (25℃)	1.665 g/cm³
Bulk Density	0.7-1.0 g/cm³
Heavy Metals (Pb)	≤ 1 ppm
Arsenic (As)	≤ 0.5 ppm
Cadmium (Cd)	≤ 0.1 ppm
Mercury (Hg)	≤ 0.01 ppm
Total Bacterial Count	≤ 100 CFU/g
Yeast & Mold	≤ 10 CFU/g
E. coli/Salmonella	Negative
Water Solubility	Freely soluble in water (≈590 g/L at 25℃)
Temperature Stability	Stable at 0-121℃ (assay retention ≥ 99%)
pH Stability	Stable at pH 2.0-7.0 (assay retention ≥ 99%)
Hygroscopy	Slightly hygroscopic
Taste	Strong sour, odorless

3. Product Advantages

1. **Natural Source & High Purity**: Microbial fermentation from corn starch, consistent with natural citric acid; assay ≥99.5%, ultra-low impurity/heavy metal content, meets infant food raw material limits; compliant with GB 2760-2021 and FDA GRAS standards.
2. **Multi-Functional Core Additive**: Integrates **acidulant**, **flavor enhancer**, **preservative**, **chelating agent** and **pH regulator**; enhances food sour taste, improves flavor layering, inhibits microbial growth, chelates metal ions, adjusts food system pH; the most widely used acidic food additive worldwide.

3. **Physiologically Safe**: Naturally present in human/animal bodies (Krebs cycle intermediate), no metabolic burden; no toxic side effects at standard food dosages, safe for infants, pregnant women, the elderly and all population groups.
4. **Excellent Stability & Processability**: Ultra-stable in food processing, no decomposition under high-temperature sterilization (121℃), baking and low-temperature freezing; freely soluble in water, rapid dissolution without precipitation; uniform dispersion in liquid/solid food, compatible with all common food additives.
5. **Chelating Property**: Forms stable soluble complexes with metal ions (Ca^{2+}, Mg^{2+}, Fe^{3+}), prevents food discoloration, precipitation and oxidation, improves food stability and shelf life; maintains the activity of vitamins and functional ingredients in food.
6. **Green & Eco-Friendly**: Microbial fermentation process with low carbon emission; fully biodegradable, no environmental pollution; inhibits food spoilage microorganisms, reduces food waste, meets green food production requirements.

4. Application Fields

Citric Acid is the most widely used multi-functional food-grade acidic additive, suitable for various beverage, bakery, confectionery, meat, dairy, seasoning, canned food and infant food:

- **Beverage Industry**: Fruit juice, carbonated drink, sports drink, fruit wine, vinegar, milk beverage; core acidulant, adjusts sour taste, improves flavor stability, chelates metal ions to prevent beverage turbidity.
- **Bakery Industry**: Bread, cake, biscuit, pastry, moon cake; acts as leavening agent auxiliary (reacts with baking soda to produce CO_2), pH regulator, improves product texture and taste, inhibits mold growth.
- **Confectionery Industry**: Candy, chocolate, jelly, jam, fruit candy; balances sweet/sour taste, improves flavor layering, prevents sugar crystallization and candy discoloration, extends shelf life.

5. Usage Methods

Food Type	Recommended Addition Dosage
Fruit Juice/Carbonated Drink/Sports Drink	0.1-1.0%
Bread/Cake/Biscuit	0.05-0.5%
Candy/Jam/Jelly/Fruit Wine	0.2-1.5%
Meat/Aquatic Products/Canned Food	0.05-0.5%
Yogurt/Cheese/Ice Cream/Dairy Drink	0.05-0.8%
Soy Sauce/Sauce/Condiment/Pickles	0.1-2.0%
Infant Food/Canned Fruit/Vegetable	0.05-0.3%

6. Packaging & Storage

- **Small Batch**: 1 kg / 5 kg / 10 kg: Food-grade aluminum foil bags (sealed, moisture-proof, oxygen-free) – for small-scale food production, health food, infant food and laboratory use.
- **Standard Batch**: 25 kg: Food-grade HDPE plastic drums with inner aluminum foil liner (sealed, dust-proof, moisture-proof) – for medium/large-scale food production and industrial use.
- **Bulk Batch**: 500 kg / 1000 kg: Food-grade FIBC bulk bags with moisture-proof PE liner (food-grade, sealed, moisture-proof valve) – for large-scale industrial production and export.

7. Safety & Protection

- The product is food-grade, low-toxic at standard dosages; mild skin/eye irritation in direct high-concentration contact; naturally present in human body, no toxic side effects at normal food intake, safe for humans (including infants/elderly/pregnant women) and animals.
- Wear food-grade PPE (safety goggles, nitrile rubber gloves, FFP1 dust mask, non-slip food-grade safety shoes) during all handling operations; impermeable protective clothing for bulk mixing/transfer.
- Follow food hygiene operation standards: wash hands thoroughly with food-grade hand sanitizer/pure water after handling; do not eat/drink/smoke while operating the product; use dedicated food-grade equipment and containers for handling to avoid cross-contamination; infant food raw material should use sterile dedicated equipment.