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Technical Data Sheet (TDS)

- Vitabate-100 (Food Grade)
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1. Product Overview

- **Product Name**: Vitabate-100 (Food Grade)
- **CAS Number**: N/A (Composite); Citric Acid 77-92-9, Malic Acid 6915-15-7, Lactic Acid 50-21-5
- **Formula**: Citric Acid (40-45%) + Malic Acid (20-25%) + Lactic Acid (15-20%) + Fumaric/Tartaric Acid (10-15%) (food-grade organic acid blend, FCC/USP standard)
- **Molecular Weight**: 90.08-192.12 Da (single organic acid molecular weight)
- **Product Characteristics**: High-purity food-grade organic acid composite blend prepared by refined purification and scientific proportioning of natural fermentation-derived organic acids (non-GMO, no chemical synthesis). White free-flowing crystalline powder with slight sour odor, highly water-soluble (clear solution), strong chelating ability with metal ions, and stable under normal food processing and storage conditions. As a multi-functional food additive, it acts as **acidulant, flavor enhancer, preservative and chelating agent**; it adjusts food acidity, enhances sour taste layering, inhibits microbial growth, and chelates metal ions to prevent food browning. Non-toxic (food-grade), environmentally friendly, fully biodegradable, compliant with GB 2760/FDA/EC/CAC food additive standards, suitable for various food production and processing.

2. Technical Specifications (Compliant with National Food Additive Standards)

Item	Standard Requirement
Appearance	White crystalline powder; free-flowing, no caking
Odor	Slight characteristic sour odor; no off-flavor
Total Organic Acid Content	≥ 98.5%
Citric Acid Content	40.0-45.0%
Malic Acid Content	20.0-25.0%
Lactic Acid Content	15.0-20.0%
Mixed Organic Acids (Fumaric/Tartaric)	10.0-15.0%
Moisture Content	≤ 1.0%
Ash Content	≤ 0.1%
pH Value (1% aqueous, 25℃)	2.0-3.0
Heavy Metals (as Pb)	≤ 1 ppm
Heavy Metals (As)	≤ 0.5 ppm
Cadmium (Cd)	≤ 0.05 ppm
Mercury (Hg)	≤ 0.01 ppm
Total Bacterial Count	≤ 100 CFU/g
E. coli	Negative
Salmonella	Negative in 25g
Water Solubility (25℃)	≥ 500 g/L (clear aqueous solution)
Bulk Density	0.70-0.90 g/cm³
Temperature Stability	Stable at 0-121℃ (short-time high temperature sterilization; ≥98% activity retention)
pH Stability	Stable at pH 1.0-7.0 (≥98% activity retention)
Chelating Ability	Strong chelation with Ca^{2+} , Mg^{2+} , Fe^{3+} , Cu^{2+}
Storage Stability	36 months unopened (≤25℃, ≤60% RH)

3. Product Advantages

1. **Multi-Functional Integration**: Integrates **acidulation, flavor enhancement, preservation and chelation** in one; replaces single organic acids and multiple food additives, reduces production cost and formula complexity.

2. **Scientific Proportioning**: Optimized organic acid ratio, mild and layered sour taste (no harsh sourness); suitable for various food flavor systems, improves food taste and acceptability.

4. Application Fields & Recommended Dosage

(Adjust dosage according to food type, acidity requirement, flavor design and preservation need; all dosages are **w/w** based on food raw materials)

Application Field	Typical Products	Recommended Dosage	Core Effect
Beverage	Fruit juice, carbonated drink, sports drink, yogurt drink	0.1-1.0%	Adjust acidity, enhance sour taste layering, prevent browning, extend shelf life
Bakery	Cake, bread, pastry, biscuit	0.2-0.8%	Adjust dough pH, improve texture, inhibit mold growth, extend shelf life
Dairy	Yogurt, cheese, flavored milk, milk beverage	0.05-0.5%	Regulate fermentation acidity, enhance flavor, inhibit harmful bacteria, maintain product stability
Candy & Confectionery	Hard candy, soft candy, jelly, chewing gum	0.5-2.0%	Provide layered sour taste, adjust sweetness-acidity balance, chelate metal ions (prevent discoloration)
Fruit & Vegetable Products	Canned fruit/vegetable, jam, pickles, dried fruit	0.3-1.5%	Adjust acidity, prevent browning/oxidation, inhibit microbial growth, extend shelf life
Meat Products	Sausage, ham, canned meat, cured meat	0.1-0.6%	Inhibit harmful bacteria, extend shelf life, improve taste, chelate metal ions (prevent fat oxidation)
Condiments	Soy sauce, vinegar, salad dressing, compound seasoning	0.2-1.2%	Adjust acidity, enhance flavor, inhibit mold/yeast, maintain product stability
Canned Food	All kinds of canned food (meat/fruit/vegetable)	0.2-1.0%	Acidification preservation, prevent browning, inhibit spoilage bacteria, extend shelf life

5. Usage Methods & Formulation Guidelines

1. **Premixing Recommended**: For **solid food systems** (bakery flour, seasoning powder, candy powder), premix Vitabate-100 with other dry ingredients (sugar, starch, salt) at a ratio of 1:10-1:20 to ensure uniform dispersion; avoid direct mixing with high-alkaline ingredients.
2. **Dissolution Method**: For **liquid food systems** (beverage, sauce, jam), dissolve Vitabate-100 in deionized water/liquid raw materials (20-40℃) with stirring (can be prepared as 20-50% stock solution); stir evenly to form a clear solution, then add to the food system (no precipitation); add slowly to avoid local high acidity.

6. Packaging, Storage & Transportation

- Small Packaging: 1 kg/5 kg food-grade aluminum foil bags (inner PE liner, vacuum sealed; for small food factories/laboratory use)
- Standard Packaging: 25 kg food-grade HDPE plastic drums (sealed, with inner PE bag; for industrial batch production)
- Bulk Packaging: 500 kg/1000 kg food-grade jumbo bags (sealed, dust-proof, moisture-proof; for large food factories/bulk purchase)
- Custom Packaging: Available upon request (100g/500g small packaging for small-batch production, specific weight for special food formulations).