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Technical Data Sheet (TDS)

Issue Date: 27 FEB 2026**Product Name:** Aspartame (Food Grade, Anhydrous)**CAS Number:** 22839-47-0

1. Product Overview

- **English Name**: Aspartame (Food Grade, Anhydrous)
- **Chinese Name**: 阿斯巴甜（无水食品级）
- **CAS No.**: 22839-47-0
- **Molecular Formula**: $C_{14}H_{18}N_2O_5$
- **Molecular Weight**: 294.30 g/mol
- **Source**: Synthesized by food-grade enzymatic condensation of L-aspartic acid and L-phenylalanine methyl ester, followed by purification, crystallization and drying; complies with food GMP and high-intensity sweetener production requirements, strict quality control for phenylalanine content.
- **Core Characteristics**: White crystalline powder, odorless, clean sweet taste (relative sweetness ≈200 times sucrose); **zero-calorie** high-intensity sweetener, no blood sugar impact; stable in neutral low-temperature food systems, decomposes at high temperature/strong acid/alkali; contains phenylalanine (contraindicated for PKU patients); sparingly soluble in water, suitable for low-sugar/zero-sugar food/beverage; meets national/international food safety standards, the most widely used high-intensity sweetener in the global low-sugar food industry.

2. Technical Specifications (Complies with GB 2760-2021 & International Food High-Intensity Sweetener Standards)

Test Item	Food Grade Specification
Appearance	White crystalline powder, free-flowing, no caking
Assay (Aspartame)	≥ 99.0%
Melting Point	246-248℃ (decomposes)
pH Value (25℃, 1% aqueous solution)	4.5-6.0
Loss on Drying (105℃, 2h)	≤ 0.5%
Ash Content	≤ 0.1%
Specific Rotation $[\alpha]_D^{25}$	+14.5° ~ +16.5°
Heavy Metals (Pb)	≤ 0.5 ppm
Arsenic (As)	≤ 0.1 ppm
Cadmium (Cd)	≤ 0.05 ppm
Mercury (Hg)	≤ 0.01 ppm
Related Substances	≤ 1.0%
Total Bacterial Count	≤ 10 CFU/g
Yeast & Mold	≤ 5 CFU/g
E. coli / Salmonella	Negative
Water Solubility	Sparingly soluble in water (≈10 g/L at 25℃), slightly soluble in ethanol
Temperature Stability	Stable at <80℃, decomposes at >120℃
pH Stability	Stable at pH 3.0-9.0, hydrolyzes at pH<3.0 or pH>9.0
Hygroscopy	Slightly hygroscopic (caking at RH>60%)

3. Core Product Advantages

1. **Ultra-High Sweetness & Zero-Calorie**: Relative sweetness ≈200 times sucrose, only a small amount is needed to achieve the desired sweetness; **zero-calorie**, no metabolism for energy in the human body, no blood sugar/insulin fluctuation – ideal for diabetics, obese people and low-sugar/zero-sugar diet populations.

2. **Clean Sweet Taste & Flavor Enhancement**: Pure, clean sweet taste with no bitter aftertaste or metallic taste; enhances the natural flavor of food/beverage (fruit/tea/dairy), masks unpleasant tastes (sour/bitter), improves product palatability without affecting the original flavor.
3. **High Safety for Normal Population**: FAO/WHO ADI 0-40 mg/kg body weight, FDA GRAS certified; no acute/chronic toxicity, no sensitization/mutagenicity/carcinogenicity; safe for pregnant/lactating women and children (non-PKU) at food dosages; decades of global use with proven long-term safety.

4. Wide Application Fields

Aspartame is a classic zero-calorie high-intensity sweetener, suitable for all **low-temperature/neutral** low-sugar/zero-sugar food and beverage production (avoid high-temperature baking/sterilization), especially for beverage, dairy, confectionery, seasoning and health food (**not for PKU patients**):

- **Beverage Industry**: Zero-sugar soda, fruit juice, tea drink, sports drink, yogurt drink, fruit wine; core sweetener, low dosage (0.02-0.1%) achieves full sweetness, clean taste enhances fruit/tea flavor, no sugar residue, suitable for cold-processed beverages.

5. Usage Methods & Recommended Dosage

Food Type	Recommended Addition Dosage	Key Application Note
Zero-sugar Beverage/Tea Drink/Fruit Juice	0.02-0.1%	Cold-processed only, mix with erythritol for cool mouthfeel
Zero-sugar Yogurt/Low-sugar Milk/Dairy	0.01-0.05%	Neutral pH system, low-temperature storage, enhances flavor
Zero-sugar Candy/Chewing Gum/Jelly	0.05-0.3%	Low-temperature molding, avoid high-temperature heating
Low-sugar Seasoning/Salad Dressing/Jam	0.01-0.08%	Neutral/slightly acidic system, low-temperature storage
Health Food/Meal Replacement Powder/Protein Powder	0.1-0.5%	Mix with other sweeteners, adjust sweetness according to formula
Zero-sugar Ice Cream/Pudding/Mousse	0.03-0.15%	Low-temperature preparation, stable in frozen system

6. Packaging, Storage & Transportation

- **Small Batch**: 100g/500g/1kg – Food-grade aluminum foil vacuum bags (high barrier, moisture-proof, oxygen-free) with inner plastic lining for small-scale production, laboratory and retail use (small dosage for high sweetness).
- **Standard Batch**: 5kg/10kg/25kg – Food-grade HDPE plastic drums with inner aluminum foil bag (sealed, dust-proof, moisture-proof) for medium/large-scale food production.
- **Bulk Batch**: 200kg/500kg – Food-grade FIBC bulk bags with high-barrier PE liner (moisture-proof, sealed valve) for large-scale industrial production and export.
- **Custom Packaging**: 10g/20g food-grade small sachets available upon request for household and small-batch food preparation.

7. Safety & Quality Assurance

- The product is food-grade, non-toxic, non-irritating for normal population; no mandatory PPE for small-scale use; wear non-slip food-grade safety shoes for bulk handling to prevent slipping from spilled powder; FFP1 dust mask is optional for heavy dust generation (only to prevent dust inhalation).
- **Key Note**: Post a prominent warning sign **"Contains Phenylalanine - No Entry for PKU Operators"** in the operating area; avoid contact with PKU patients during production.
- Follow food hygiene operation standards: wash hands with soap and water after handling; use dedicated food-grade equipment/containers; keep the operating area dry (RH<50%) to avoid caking of spilled powder; use low-temperature mixing equipment (≤60℃).