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Technical Data Sheet (TDS)

- Trehalose (Food Grade)
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1. Product Overview

- **Product Name**: Trehalose (Food Grade)
- **CAS Number**: 99-20-7
- **EINECS/EC Number**: 202-739-6
- **Chemical Formula**: $C_{12}H_{22}O_{11}$
- **Molecular Weight**: 342.30 Da
- **Chemical Name**: a,a-Trehalose
- **Product Characteristics**: High-purity food-grade trehalose (≥99.0%) produced by microbial fermentation (yeast/bacteria) and subsequent purification/crystallization. White free-flowing crystalline powder, odorless with mild sweetness (45% of sucrose), highly water-soluble and low hygroscopicity; it is a non-reducing disaccharide with unique **bioprotective properties** (protects proteins, starch, lipids from denaturation/degradation caused by drying, freezing and high temperature). As a multi-functional food additive, it acts as **sweetener, humectant, cryoprotectant, stabilizer, flavor protectant and anti-aging agent**; it maintains food texture, prevents moisture loss, protects natural flavors and nutrients, and is suitable for low-sugar/functional food formulation. FDA GRAS/EC E968 certified; compliant with GB 2760/FDA/EC/CAC/FCC/USP standards, widely used in various food production.
- **Core Application**: Food additive (sweetener/humectant/stabilizer) for bakery, confectionery, dairy, beverage, meat, aquatic products, snack food, prepared food and functional food industries; cryoprotectant for frozen food, humectant for baked goods, flavor protectant for beverage and seasoning.

2. Technical Specifications (Compliant with GB 2760 & FCC/USP)

Item	Standard Requirement
Appearance	White crystalline powder, free-flowing, no caking
Odor/Taste	Odorless, mild sweet, no off-taste
Assay (Trehalose)	≥ 99.0%
Loss on Drying	≤ 0.5%
Residue on Ignition	≤ 0.1%
Reducing Sugar (as glucose)	≤ 0.1%
Glucose	≤ 0.5%
Fructose	≤ 0.1%
Heavy Metals (as Pb)	≤ 1 ppm
Arsenic (As)	≤ 0.5 ppm
Cadmium (Cd)	≤ 0.05 ppm
Mercury (Hg)	≤ 0.01 ppm
pH Value (5% aqueous solution, 25℃)	5.0-7.0
Total Bacterial Count	≤ 100 CFU/g
E. coli	Negative
Salmonella	Negative in 25g
Water Solubility (25℃)	≥ 88 g/100mL
Hygroscopy	Low
Sweetness	~45% of sucrose (10% aqueous)
Temperature Stability	Stable at 0-121℃ (food processing temperature)
Storage Stability	36 months unopened (≤25℃, RH ≤60%, sealed)

3. Product Advantages

1. **Mild Sweetness & Low Hygroscopicity**: 45% sweetness of sucrose, clean sweet taste without aftertaste; far lower hygroscopicity than sucrose/glucose, no caking under normal storage, maintains free-flowing property for a long time, suitable for powder food formulation.
2. **Unique Bioprotective Effect**: Protects food proteins, starch, lipids and natural flavors from denaturation/degradation caused by drying, freezing, high temperature and osmosis; maintains the original texture and nutrition of food, extends shelf life by 30-50%.

4. Application Fields & Recommended Dosage

(Adjust dosage according to food type, functional requirement (moisturizing/anti-freezing/sweetening) and formula design; all dosages are **w/w** based on food raw materials, comply with GMP dosage limits for all food categories.)

Application Field	Typical Products	Recommended Dosage	Core Effect
Bakery	Bread, cake, pastry, cookie, moon cake	1-8%	Humectant, anti-staling, texture softening, moisture
Confectionery	Hard candy, soft candy, chocolate, chewing gum	2-10%	Mild sweetening, anti-crystallization, texture
Dairy Products	Yogurt, ice cream, milk powder, cheese	1-6%	Cryoprotectant (ice cream), texture improvement, flavor
Beverage	Fruit juice, carbonated drink, functional drink,	0.5-4%	Flavor protectant, anti-oxidation, mild sweetening,
Frozen Food	Frozen meat, aquatic products, dumplings,	1-5%	Cryoprotectant, anti-ice crystal, texture maintenance,
Snack Food	Dried fruit, potato chips, nuts, dried meat	0.5-3%	Moisture control, anti-aging, flavor protection, texture
Prepared Food	Ready-to-eat meal, sauce, seasoning, jam	0.5-4%	Flavor protectant, stabilizer, anti-oxidation, texture
Functional Food	Low-sugar food, diabetic food, nutritional	2-10%	Low GI sweetener, nutrient protectant, texture

5. Usage Methods & Formulation Guidelines

Key Tip: Trehalose has high water solubility and stability; it can be dissolved in water or dry mixed with other ingredients, suitable for all food processing processes (mixing, heating, freezing, drying).

1. **Aqueous Dissolution Method**: For liquid food systems (beverage, dairy, sauce, jam), dissolve trehalose in room temperature food-grade deionized water (10-20% stock solution) with stirring; add the stock solution to food and mix evenly (no precipitation, suitable for all temperatures).
2. **Dry Mixing Method**: For solid food systems (bakery flour, confectionery powder, snack seasoning, milk powder), premix trehalose with other dry food ingredients (flour, sugar, starch, salt) at any ratio; mix thoroughly to ensure uniform dispersion (no agglomeration).

6. Packaging, Storage & Transportation

- Small Packaging: 1 kg/5 kg food-grade aluminum foil bags (heat-sealed, moisture-proof; for small food factories/laboratory use)
- Standard Packaging: 25 kg food-grade HDPE plastic drums (inner PE bag, sealed cover; for industrial batch production)
- Bulk Packaging: 500 kg/1000 kg food-grade jumbo bags (moisture-proof film, sealed; for large food factories/bulk purchase)

7. Quality Assurance & Technical Support

1. **Production Standards**: Manufactured in a GMP/HACCP-compliant food-grade production workshop; microbial fermentation, purification and crystallization processes meet ISO 9001 (Quality Management) and ISO 22000 (Food Safety) standards; no harmful byproducts, pure trehalose content ≥99.0%.
2. **Batch Testing**: Every batch of trehalose is subject to **strict multi-index testing** (physical, chemical, microbiological, purity, reducing sugar, heavy metals); a detailed Certificate of Analysis (COA) is provided with each shipment to ensure compliance with GB 2760/FCC/USP/EC standards.