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Technical Data Sheet (TDS)

SHMP (Sodium Hexametaphosphate) (Food Grade, Powder)

1. Product Overview

- Product Name: SHMP (Sodium Hexametaphosphate)
- English Name: Sodium Hexametaphosphate
- CAS Number: 10124-56-8
- Formula: $(NaPO_3)_6$
- Molecular Weight: 611.77 g/mol
- **Product Characteristics**: Food-grade SHMP is an odorless white free-flowing inorganic polyphosphate powder with high purity (≥99.0%) and excellent sequestering, emulsifying, water-retaining and anti-caking properties. It is highly soluble in water, forms stable complexes with metal ions (Ca^{2+}, Mg^{2+}, Fe^{3+}), and can improve food texture, stability and shelf life by chelating metal ions, emulsifying oil-water and retaining water. Compliant with GB 2760-2021, FDA, FAO/WHO and EU food safety standards, it is a multifunctional food additive widely used in the global food industry, and also used in water treatment and industrial detergent fields.

2. Technical Specifications (Complies with GB 1886.4-2015 / FCC / FAO/WHO)

Item	Specification (Food Grade, Powder)
Appearance	White free-flowing powder, no caking
Assay (SHMP, as $(NaPO_3)_6$)	≥ 68.0%
Non-phosphate (as Na_2O)	28.0-30.0%
pH Value (25℃, 1% solution)	5.8-7.3
Heavy Metals (Pb)	≤ 0.5 ppm
Arsenic (As)	≤ 0.1 ppm
Fluoride (F)	≤ 50 ppm
Insoluble Matter in Water	≤ 0.1%
Loss on Ignition (105℃, 2h)	≤ 0.5%
Total Bacterial Count	≤ 100 CFU/g
E. coli	Negative
Salmonella	Negative
Particle Size	80-200 mesh (uniform fine powder)
Bulk Density	0.8-1.2 g/cm³
Water Solubility	Highly soluble (≈60 g/100 mL at 25℃)
Temperature Stability	Stable at 0-100℃ (short time), hydrolyzes at ≥616℃
pH Stability	Stable at pH 4.0-8.0 (sequestering activity retention ≥90%)
Sequestering Capacity	≥ 100 mg $CaCO_3$/g (at 25℃, pH 7.0)

3. Product Advantages

1. **Multifunctional Performance**: Integrates sequestering, emulsifying, water retention, anti-caking and texture modification functions; one product for multiple uses, reducing the use of other food additives.
2. **Excellent Sequestering Property**: Forms stable water-soluble complexes with most metal ions, effectively inhibiting metal ion-catalyzed food oxidation and spoilage, improving food stability.
3. **Superior Water Retention**: Reduces water loss in food during processing, storage and cooking, improves food juiciness and tenderness (especially for meat/seafood).
4. **Good Emulsification & Anti-caking**: Stabilizes oil-water emulsion system in food, prevents fat separation; improves fluidity of powder food, prevents caking and agglomeration.
5. **High Stability**: Stable in most food systems (neutral/weak acid/weak base) and food processing conditions (pasteurization, boiling, freezing); no decomposition for short-term high-temperature treatment.
6. **Food-Grade Safety**: Complies with global food safety standards, FDA/CFDA GRAS certified, ADI specified by FAO/WHO; non-toxic at food dosage, essential phosphate source for human body.

7. **Wide Compatibility**: Compatible with most food additives (acidulants, sweeteners, thickeners, antioxidants, preservatives); no adverse reaction in food systems.

4. Application Fields

Food-grade SHMP is a multifunctional food additive (specified total phosphate dosage limit in GB 2760-2021), suitable for **various food and beverage processing**; also used in industrial fields:

- **Meat & Poultry Industry**: Ham, sausage, bacon, cooked meat, frozen meat; water retention agent, sequestrant, emulsifier; improves water retention, juiciness and tenderness, inhibits oxidation, extends shelf life.
- **Seafood Industry**: Frozen fish/shrimp, surimi products, canned seafood; anti-freezing agent, water retention agent, sequestrant; prevents protein denaturation and water loss during freezing/thawing, maintains texture.
- **Dairy Industry**: Milk powder, cheese, yogurt, dairy beverage; anti-caking agent, emulsifier, sequestrant; prevents milk powder caking, stabilizes dairy emulsion, inhibits metal ion-catalyzed spoilage.
- **Beverage Industry**: Carbonated beverage, fruit juice, sports beverage, protein beverage; sequestrant, stabilizer; chelates metal ions, prevents turbidity and precipitation, improves beverage clarity and stability.
- **Canned Food Industry**: Canned meat, canned vegetables, canned fruit, canned beans; sequestrant, texture modifier; inhibits metal ion-catalyzed discoloration, maintains food texture and color.

5. Usage Methods

Food Type	Recommended Dosage	Main Function
Meat/Poultry Products	0.1-0.5%	Water retention, sequestration, emulsification
Seafood/Surimi Products	0.1-0.4%	Water retention, anti-freezing, sequestration
Milk Powder/Dairy Beverage	0.05-0.2%	Anti-caking, emulsification, sequestration
Carbonated/Fruit Juice Beverage	0.02-0.1%	Sequestration, stabilization, anti-precipitation
Canned Food (meat/vegetable/fruit)	0.05-0.3%	Sequestration, anti-discoloration, texture modification
Bread/Cake/Biscuit	0.05-0.2%	Anti-caking, dough stabilization, texture modification
Condiment/Soy Sauce/Vinegar	0.03-0.15%	Sequestration, stabilization, anti-precipitation

6. Packaging & Storage

- **Small Batch**: 500 g/1 kg/5 kg food-grade HDPE plastic drums (small-scale food processing/retail)
- **Standard Batch**: 10 kg/25 kg food-grade paper composite bags with plastic inner lining (medium-scale food production)
- **Bulk Batch**: 50 kg/100 kg food-grade HDPE plastic drums/ton bags (large-scale food production/export)
- **Custom Packaging**: Available upon request (according to customer's processing and dosage requirements)

7. Safety & Protection

- The product is non-toxic and mild irritant (eyes/skin/respiratory tract); wear nitrile rubber gloves and chemical protective goggles during handling to avoid dust entering eyes and direct contact with large amounts of powder.
- Wear FFP1/FFP2 respirator during bulk handling/powder mixing to prevent inhalation of dust and mild respiratory irritation; wear a face shield for large-scale dust generation operations.