Technical Data Sheet (TDS)

1. Product Overview

- Product Name: Reverse Osmosis Antiscalant (PESA) Aqueous Solution - English Name: Reverse Osmosis Antiscalant (PESA) - CAS Number: 1528-98-7 - Formula: $(C_4H_6O_5)_n$ (Polyepoxysuccinic Acid) - Molecular Weight: 1000-3000 g/mol (Polymer) - Product Characteristics: High-efficiency, non-phosphorus, biodegradable antiscalant specially designed for reverse osmosis (RO) systems. Features broad-spectrum scale inhibition (calcium carbonate, calcium sulfate, magnesium scale, iron oxide scale, etc.) with low dosage. Excellent compatibility with RO membranes (cellulose acetate, polyamide) and other water treatment agents (biocides, flocculants). No phosphorus, no eutrophication risk; stable under high temperature and wide pH range; does not affect RO system flux and desalination rate.

2. Technical Specifications (Complies with GB/T 22232-2008 & GB/T 30300-2013)

Item	Specification
Appearance	Colorless to pale yellow transparent liquid, no mechanical impurities
Solid Content	30.0±2.0%
pH Value (25℃, 1% Solution)	7.0-9.0
Density (25℃)	1.15-1.25 g/cm³
Calcium Carbonate Scale Inhibition Rate	≥ 90% (80℃, 24h, 500 mg/L Ca^{2+})
Heavy Metals (Pb)	≤ 0.0005%
Arsenic (As)	≤ 0.0001%
Iron (Fe)	≤ 0.001%
Chloride Content (as Cl^-)	≤ 0.1%
Stability (25℃, 12 months)	No delamination, no precipitation, scale inhibition rate ≥ 85%
Solubility (20℃, water)	Fully miscible
Flash Point	Not applicable (non-flammable)

3. Product Advantages

1. Broad-Spectrum Scale Inhibition: Efficiently inhibits formation of calcium carbonate, calcium sulfate, magnesium hydroxide, iron oxide, and other scales common in RO systems; suitable for high-hardness, high-alkalinity water sources. 2. Non-Phosphorus & Environmental Protection: No phosphorus-containing components, avoiding eutrophication of water bodies; fully

biodegradable, compliant with environmental protection regulations. 3. Excellent Membrane Compatibility: No damage to RO membranes (polyamide, cellulose acetate); does not reduce membrane flux and desalination rate; can be used with most RO membrane types. 4. Ultra-Low Dosage & Cost-Saving: Effective at 2-8 mg/L, significantly reducing usage cost compared to traditional antiscalants; reduces membrane cleaning frequency and extends membrane service life. 5. Wide Adaptability: Stable under temperature 5-60℃ and pH 4.0-10.0; compatible with biocides (isothiazolinones, chlorine dioxide) and flocculants (PAC, PAM) commonly used in water treatment systems.

4. Application Fields

- Reverse Osmosis (RO) Systems: Municipal water purification, industrial wastewater reuse, seawater desalination, brackish water desalination RO systems; prevents scale formation on membrane surfaces. - Nanofiltration (NF) & Ultrafiltration (UF) Systems: Pretreatment and deep treatment systems for water purification; scale inhibition and membrane protection. - Industrial Water Treatment: Cooling water systems, boiler feed water systems, circulating water systems; prevents scale formation in pipelines and equipment. - Other Fields: Electrolytic plating water treatment, semiconductor industry water treatment, power plant water treatment; high-purity water preparation systems.

5. Usage Methods

- Dosage (as undiluted product): - RO System (Normal Water Quality): 2-5 mg/L (based on feed water flow rate); add continuously before RO membrane. - RO System (High Hardness/High Alkalinity Water): 5-8 mg/L; can be used with acid adjustment (pH 6.5-7.5) for better effect. - Cooling Water System: 10-20 mg/L; add continuously or intermittently. - Usage: Dilute the product with deionized water or feed water (dilution ratio 1:5 to 1:10) before use; stir evenly; use a metering pump to add continuously to the feed water pipeline (1-2 meters before RO membrane). - Optimal Conditions: Use at temperature 5-60℃; pH 4.0-10.0; avoid mixing with strong acids or oxidizers directly; flush the system with water before initial use.

6. Packaging & Storage

- Packaging Specifications: 25 kg HDPE plastic drums; 200 kg HDPE plastic drums; 1000 kg IBC totes; custom packaging available upon request. - Storage Conditions: Store in cool, dry, well-ventilated warehouse (5-30℃); keep container tightly closed; avoid direct sunlight, high temperature, and freezing; store separately from strong acids, oxidizers, and food-grade materials. - Shelf Life: 12 months (unopened, specified conditions); if frozen, thaw at room temperature and stir evenly before use (does not affect product performance); use promptly after opening, seal tightly after each use. - Transportation: UN 3267 (Class 8 Corrosive); transport in corrosion-resistant vehicles; avoid collision, leakage, and exposure to sunlight/heat; do not transport with strong acids or oxidizers; prevent freezing during transportation in cold areas.

7. Safety & Protection

- Mildly irritating to skin and eyes; low toxicity; no flammable, explosive, or corrosive hazards under normal use conditions. - Operators must wear chemical-resistant gloves, safety goggles, and protective clothing; avoid skin and eye contact; wash hands thoroughly with soap and water after handling. - In case of skin contact, rinse with plenty of running water for 10-15 minutes; if irritation occurs, apply emollient and seek medical attention. - In case of eye contact, rinse with clean water or normal saline for 15-20 minutes immediately and seek medical help. - Do not ingest; keep away from children and pets; avoid contamination of water sources and aquatic environments. - Do not mix with strong acids or oxidizers directly (dilute first if necessary) to avoid reducing product efficiency.

8. Quality Assurance

- Manufactured in accordance with ISO 9001 quality management system standards; strictly controls raw materials, production processes, and finished product testing. - Each batch of product is strictly tested with a Certificate of Analysis (COA) to meet GB/T 22232-2008, GB/T 30300-2013, and international quality standards. - Provide professional technical support: customize dosage scheme based on feed water quality and RO system parameters; provide on-site guidance for product use and system maintenance; solve scale inhibition problems in RO systems.