Technical Data Sheet (TDS)

1. Product Overview

- Product Name: Strong Acid Cation Exchange Resin (Sulfonic Acid Type) - English Name: Strong Acid Cation Resin - CAS Number: 39339-85-0 - Formula: $(C_8H_8 \cdot C_{10}H_{10})_n \cdot (C_6H_4SO_3H)_m$ (Styrene-DVB Copolymer) - Molecular Weight: 100000-200000 g/mol - Product Characteristics: High-efficiency, macroporous strong acid cation exchange resin with sulfonic acid (-SO_3H) functional groups. Features high total exchange capacity, excellent mechanical strength, good chemical stability, and uniform particle size distribution. Suitable for deep water softening, desalination, and demineralization; resistant to oxidation and fouling; stable in acidic, neutral, and moderately alkaline environments; long service life with proper regeneration and maintenance.

2. Technical Specifications (Complies with GB/T 13659-2008)

Item	Specification
Appearance	Light yellow to amber spherical beads, uniform
Total Exchange Capacity	≥ 4.5 mmol/g
Moisture Content	45-55%
Particle Size Range	0.315-1.25 mm (≥ 95%)
Wet True Density (25℃)	1.20-1.30 g/cm³
Wet Bulk Density (25℃)	0.75-0.85 g/cm³
Mechanical Strength	≤ 2.0%
Uniformity Coefficient	≤ 1.6
Total Iron Content	≤ 0.03%
Operating Temperature	0-120℃
Operating pH Range	1.0-14.0
Residual Styrene Content	≤ 0.5%

3. Product Advantages

1. High Exchange Capacity: Total exchange capacity ≥ 4.5 mmol/g (dry basis), ensuring efficient removal of cations (Ca^{2+}, Mg^{2+}, Na^{+}, Fe^{3+}, etc.) from water, suitable for deep desalination and softening. 2. Excellent Mechanical Strength: Wear rate ≤ 2.0%, good compression resistance and impact resistance, reducing bead breakage and powder generation during operation and regeneration, extending service life. 3. Stable Chemical Performance: Resistant to oxidation, fouling, and hydrolysis; stable in a wide pH range (1.0-14.0) and high temperature (up to 120℃), suitable for harsh working environments. 4. Uniform Particle Size: Uniformity coefficient ≤ 1.6, ensuring uniform flow distribution and mass transfer, reducing pressure drop and improving operation efficiency. 5. Easy Regeneration: Can be regenerated with dilute hydrochloric acid (HCl) or sulfuric acid (H_2SO_4), high regeneration efficiency, low regeneration agent consumption, and cost-saving. 6. Wide Adaptability: Compatible with various water treatment systems, suitable for municipal water, industrial wastewater, food and beverage, pharmaceutical, and power plant water treatment.

4. Application Fields

- Water Softening: Municipal water supply, industrial circulating water, boiler feed water softening to remove Ca^{2+} and Mg^{2+}, preventing scale formation. - Water Desalination & Demineralization: Reverse osmosis (RO) pretreatment, mixed bed demineralization, high-purity water preparation for power plants, electronics, and semiconductor industries. - Industrial

Wastewater Treatment: Removal of heavy metal ions (Cu^{2+} , Ni^{2+} , Zn^{2+} , etc.) from electroplating wastewater, printing and dyeing wastewater, and mining wastewater. - Food & Beverage Industry: Purification of drinking water, beverage water, and food processing water; removal of impurities and heavy metals to meet food safety standards. - Pharmaceutical Industry: High-purity water preparation for drug production, purification of pharmaceutical intermediates, and removal of toxic impurities. - Chemical Industry: Chemical separation and purification, catalyst regeneration, and recovery of valuable metals from chemical wastewater.

5. Usage Methods

- Pretreatment Before Use: Rinse the resin with deionized water to remove surface dust and impurities; soak in 5-10% hydrochloric acid for 2-4 hours to activate (convert to H^+ form), then rinse with deionized water until the effluent pH is 3.0-5.0. - Operating Conditions: Flow rate: 10-30 BV/h (bed volume per hour); operating temperature: 5-100℃; operating pressure: ≤ 0.6 MPa; inlet water turbidity: ≤ 5 NTU. - Regeneration Method: Regeneration agent: 5-10% hydrochloric acid (HCl) or 2-5% sulfuric acid (H_2SO_4); regeneration flow rate: 2-5 BV/h; regeneration time: 30-60 minutes; rinse flow rate: 10-20 BV/h until effluent pH is stable. - Post-Operation Maintenance: Rinse the resin with deionized water after operation; keep the resin moist during storage; avoid drying out or freezing.

6. Packaging & Storage

- Packaging Specifications: 25 kg sealed HDPE drums (with inner plastic bags); 100 kg fiber drums (with inner plastic bags); custom packaging available upon request. - Storage Conditions: Store in cool, dry, well-ventilated warehouse (5-35℃); keep the container tightly closed to prevent moisture loss, dust contamination, and resin drying; avoid direct sunlight, high temperature, and freezing; store separately from strong oxidizers, strong bases, and food-grade materials; stack drums no more than 3 layers to prevent crushing. - Shelf Life: 24 months (unopened, specified conditions, kept moist); if resin dries out, rehydrate slowly with deionized water (add water dropwise to avoid rapid swelling and bead cracking) before use. - Transportation: Transport in sealed packaging, avoid collision, vibration, and impact; keep away from strong oxidizers and strong bases; prevent rain and moisture during transit; no special temperature control required (avoid extreme cold and heat).

7. Safety & Protection

- The resin is mildly irritating to skin, eyes, and respiratory tract, low toxicity, non-flammable, and non-explosive. - Operators must wear dust mask (N95 or equivalent), chemical-resistant gloves (nitrile or rubber), safety goggles, and protective clothing during handling to avoid direct contact with resin dust and beads. - Avoid generating resin dust during operation; use wet methods (e.g., spray water) to suppress dust if necessary. - 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 emergency medical help. - Do not eat, drink, or smoke in the workplace; wash hands thoroughly with soap and water after handling. - Keep away from children and pets; avoid contamination of water sources and aquatic environments; do not discard resin beads into sewers or rivers.

8. Quality Assurance

- Manufactured in accordance with ISO 9001 quality management system standards; strictly controls raw materials (styrene, DVB, sulfonating agent), production processes (polymerization, sulfonation, screening), and finished product testing. - Each batch of product is strictly tested with a Certificate of Analysis (COA) to meet GB/T 13659-2008 and international quality standards, ensuring product performance and stability. - Provide professional technical support: customize resin selection and application schemes based on user water quality and system parameters; provide on-site guidance for resin loading, pretreatment, operation, regeneration, and maintenance; solve technical problems during use.