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Technical Data Sheet (TDS)

1. Product Overview

- Product Name: Benzotriazole (BTA) - English Name: Benzotriazole - CAS Number: 95-14-7 - Formula: $C_6H_5N_3$ - Molecular Weight: 119.12 g/mol - Product Characteristics: High-efficiency corrosion inhibitor specially designed for copper and copper alloys (brass, bronze), with strong adsorption capacity on metal surfaces. Forms a dense protective film to prevent metal corrosion and oxidation; excellent high-temperature resistance (up to 200℃) and wide pH adaptation range (5.0-9.0); good compatibility with other water treatment agents (阻垢剂, biocides); low dosage, high efficiency, and cost-saving; stable chemical properties, not easy to decompose; slightly soluble in cold water, easily soluble in hot water and organic solvents.

2. Technical Specifications (Complies with GB/T 19469-2004)

Item	Specification
Appearance	White to off-white crystalline powder, no
Purity (by HPLC)	≥ 99.0%
Melting Point Range	98.0-100.0℃
Moisture Content	≤ 0.5%
Ash Content	≤ 0.1%
Solubility (25℃, in water)	≥ 1.0 g/L
pH Value (25℃, 1% Aqueous	5.0-7.0
Heavy Metals (Pb)	≤ 0.0005%
Iron (Fe)	≤ 0.001%
Stability (25℃, 24 months)	No caking, no discoloration, corrosion inhibition
Operating Temperature	0-200℃
Operating pH Range	5.0-9.0

3. Product Advantages

1. Superior Copper Corrosion Inhibition: Strong adsorption capacity on copper and copper alloy surfaces, forms a dense, non-toxic protective film to prevent pitting corrosion, oxidation, and tarnishing; corrosion inhibition rate ≥ 95% for copper materials in cooling water systems. 2. Broad Metal Compatibility: Effective for copper, brass, bronze, and other copper alloys; also has mild corrosion inhibition effect on iron, steel, and aluminum materials; suitable for mixed metal systems. 3. High Temperature & Wide pH Adaptability: Stable at temperatures up to 200℃, no decomposition or loss of performance; applicable in pH range 5.0-9.0, suitable for various water quality conditions (neutral, slightly acidic, slightly alkaline). 4. Low Dosage & Cost-Saving: Effective dosage is 1-5 mg/L in water treatment systems, 0.1-0.5% in metal processing fluids; significantly lower dosage than traditional corrosion inhibitors, reducing usage cost and environmental impact. 5. Good Compatibility: Compatible with other water treatment agents (polycarboxylate scale inhibitors, organic phosphonate corrosion inhibitors, isothiazolinone biocides), can be used in combination to enhance overall treatment effect; no adverse reactions with common industrial chemicals. 6. Stable Chemical Properties: Resistant to hydrolysis, oxidation (except strong oxidizers), and microbial degradation; long service life in water treatment systems; does not produce toxic by-products.

4. Application Fields

- Industrial Cooling Water Systems: Corrosion inhibition for copper and copper alloy components (heat exchangers, condensers, pipelines) in power plants, chemical plants, oil refineries, and air conditioning systems; prevents corrosion and scaling. - Metal Surface Treatment: Rust prevention and corrosion protection for copper and copper alloy products (hardware, electronic components, automotive parts) during processing, storage, and transportation; additive for metal cleaning and pickling solutions. - Electronic Industry: Corrosion protection for printed circuit boards (PCBs), semiconductor components, and electronic connectors; prevents metal oxidation and ensures electrical conductivity. - Lubricating Oil & Grease Industry: Additive for industrial lubricating oils, greases, and cutting fluids; improves anti-corrosion performance and extends service life of lubricants.

5. Usage Methods

- Dosage (as pure product): - Industrial Cooling Water Systems: 1-5 mg/L (based on water quality and metal content); add continuously. - Metal Processing Fluids (cutting, grinding fluids): 0.1-0.5% (mass fraction); add to the fluid during preparation. - Electroplating Baths: 0.05-0.2 g/L; add to the plating bath and stir evenly. - Coating Additive: 0.5-2.0% (based on coating weight); mix with coating components before application. - Usage: For water-soluble systems (cooling water, metal cleaning fluids): Dissolve the product in hot water (60-80℃) first (dissolution ratio 1:100), then dilute to the required concentration with system water; stir evenly;

6. Packaging & Storage

- Packaging Specifications: 25 kg paper-plastic composite bags (with inner PE liner); 200 kg iron drums (lined with PE bag); custom packaging available upon request. - Storage Conditions: Store in cool, dry, well-ventilated warehouse (5-35℃); keep container tightly closed to prevent moisture absorption, dust contamination, and caking; avoid direct sunlight, high temperature (>50℃), and humidity (>80%); store separately from strong oxidizers, strong acids, food-grade materials, and combustible materials; stack bags/drums stably (no more than 3 layers for bags, 2 layers for drums) to prevent tipping and damage.

7. Safety & Protection

- The product is a toxic solid, mildly irritating to skin and eyes, highly toxic to aquatic organisms; combustible, no explosive hazards under normal conditions. - Operators must wear full personal protective equipment: dust mask (N95 or equivalent), chemical-resistant gloves (nitrile or rubber), safety goggles, face shield, and dust-proof protective clothing; avoid skin and eye contact, and inhalation of dust. - Operate in well-ventilated area; install emergency eyewash stations and safety showers nearby; in case of leakage, follow accidental release measures to avoid environmental contamination (especially aquatic ecosystems). - In case of skin contact: Rinse with plenty of running water for at least 15 minutes immediately, remove contaminated clothing, and seek medical attention if irritation persists.

8. Quality Assurance

- Manufactured in accordance with ISO 9001 quality management system standards; strictly controls raw materials (o-phenylenediamine, sodium nitrite), production processes (diazotization, cyclization, purification), and finished product testing. - Each batch of product is strictly tested with a Certificate of Analysis (COA) to meet GB/T 19469-2004 and international quality standards, ensuring product purity, corrosion inhibition performance, and safety. - Provide professional technical support: customize dosage and application schemes based on user system parameters (water quality, metal type, temperature, pH); provide on-site guidance for product use, dosage adjustment, and system maintenance; solve corrosion problems in industrial systems in a timely manner.