

## Technical Data Sheet (TDS)

### 1. Product Overview

- Product Name: 巯基苯并噻唑 - English Name: Mercaptobenzothiazole (MBT) - CAS Number: 149-30-4 - Formula:  $C_7H_5NS_2$  - Molecular Weight: 167.25 g/mol - Product Characteristics: High-purity benzothiazole derivative with excellent rubber vulcanization acceleration and metal corrosion inhibition performance; strong chelating ability with copper, iron, zinc and other metal ions; good thermal stability (stable at  $\leq 200^\circ\text{C}$ ); wide pH adaptation range (4.0-9.0); compatible with most rubber additives and water treatment agents; combustible solid, low volatility; suitable for rubber industry, metal surface treatment, lubricating oil and other industrial fields.

### 2. Technical Specifications (Complies with GB/T 11407-2013)

| Item                                          | Specification                                     |
|-----------------------------------------------|---------------------------------------------------|
| Appearance                                    | Pale yellow to light brown crystalline powder, no |
| Purity (by Titration)                         | $\geq 99.0\%$                                     |
| Melting Point Range                           | $163-167^\circ\text{C}$                           |
| Ash Content                                   | $\leq 0.3\%$                                      |
| Moisture Content ( $105^\circ\text{C}$ , 2h)  | $\leq 0.5\%$                                      |
| pH Value ( $25^\circ\text{C}$ , 1% Aqueous)   | 5.0-7.0                                           |
| Chloride ( $\text{Cl}^-$ ) Content            | $\leq 0.01\%$                                     |
| Heavy Metals (Pb) Content                     | $\leq 0.0005\%$                                   |
| Solubility in Ethanol ( $25^\circ\text{C}$ )  | $\geq 10$ g/100 mL                                |
| Thermal Stability ( $200^\circ\text{C}$ , 2h) | No obvious decomposition, vulcanization           |
| Operating pH Range                            | 4.0-9.0                                           |

### 3. Product Advantages

1. Excellent Rubber Vulcanization Acceleration: Effectively accelerates the vulcanization reaction of natural rubber and synthetic rubber (styrene-butadiene rubber, butadiene rubber); shortens vulcanization time, improves vulcanization efficiency; enhances rubber tensile strength, tear resistance and wear resistance (tensile strength  $\geq 25$  MPa). 2. Strong Metal Corrosion Inhibition: Forms stable chelates with copper, iron, zinc and other metal ions (chelation constant  $\geq 10^{12}$ ); effectively inhibits metal corrosion in cooling water systems and metal plating processes; corrosion inhibition rate  $\geq 90\%$  for copper and carbon steel. 3. Good Thermal Stability: Stable at high temperature ( $\leq 200^\circ\text{C}$ ); no decomposition or loss of performance in high-temperature rubber vulcanization and industrial water treatment systems; suitable for high-temperature industrial applications. 4. Wide pH Adaptation Range: Effective in acidic, neutral and slightly alkaline environments (pH 4.0-9.0); no need for additional pH adjustment in most application scenarios; compatible with acid-base adjustment agents.

### 4. Application Fields

- Rubber Industry: Vulcanization accelerator for natural rubber, styrene-butadiene rubber, butadiene rubber, nitrile rubber and other rubbers; used in the production of tires, hoses, seals, rubber shoes, rubber rollers and other rubber products; improves rubber mechanical properties and service life. - Metal Surface Treatment: Corrosion inhibitor for industrial cooling water systems



# NEWAY SINOPHC TECH. LIMITED

ADD:RM. 204, BUILDING 3, NO. 188, AONA RD., CHINA (SHANGHAI) PILOT FREE TRADE ZONE.  
Email:marketing01@newayphc.com; Phone:+86-021-50350029 <https://www.newayphc.com>

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(power plants, chemical plants), metal plating processes and metal storage; prevents metal corrosion and oxidation; used as a chelating agent in metal cleaning solutions. - Lubricating Oil Industry: Additive in industrial lubricating oils and greases; improves lubricating performance, anti-wear and anti-corrosion properties; extends lubricating oil service life and equipment maintenance cycle.

## 5. Usage Methods

- Dosage (as pure product): - Rubber Industry: 0.5-2.0 parts per 100 parts rubber (based on rubber type and performance requirements); mixed with other rubber additives (sulfur, zinc oxide) during rubber mixing. - Metal Corrosion Inhibition: 1-10 mg/L in cooling water systems; 5-20 mg/L in metal plating processes; add continuously or intermittently. - Lubricating Oil Industry: 0.1-0.5% (based on lubricating oil total weight); add during lubricating oil formulation. - Chemical Synthesis: 5-15% (based on reaction substrate weight); add to reaction system as intermediate. - Usage: For solid mixing systems (rubber, lubricating oil): Grind the product into fine powder, mix evenly with other components; for liquid systems (water treatment, chemical synthesis): Dissolve the product in ethanol or hot water (dissolution ratio 1:10), stir evenly, then dilute to the required concentration. - Optimal Conditions: Use at temperature 20-200°C and pH 4.0-9.0; for high-temperature rubber vulcanization (150-200°C), adjust dosage appropriately (increase by 10-20%); avoid mixing with strong oxidants and strong acids directly (dilute first if necessary).

## 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°C); keep container tightly closed to prevent moisture absorption, dust contamination, and caking; avoid direct sunlight, high temperature (>50°C), and humidity (>80%); store separately from strong oxidants, strong acids, strong bases, 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; keep away from children and pets. - Shelf Life: 24 months (unopened, specified conditions); use promptly after opening, seal tightly after each use; do not use if caking, discoloration (turning dark brown), or moisture absorption occurs.

## 7. Safety & Protection

- The product is a combustible solid, irritating to skin and eyes, skin sensitizer, highly toxic to aquatic organisms; decomposes at high temperature to release toxic fumes. - 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; sensitive individuals should avoid contact. - 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 redness, itching, or rash occurs (allergic reaction risk).

## 8. Quality Assurance

- Manufactured in accordance with ISO 9001 quality management system standards; strictly controls raw materials (aniline, carbon disulfide, sulfur), production processes (cyclization, purification, crystallization), and finished product testing. - Each batch of product is strictly tested with a Certificate of Analysis (COA) to meet GB/T 11407-2013 and international quality standards, ensuring product purity, performance, and safety.