

Technical Data Sheet (TDS)

1. Product Overview

- Product Name: 2-Phosphonobutane-1,2,4-tricarboxylic Acid (PBTCa)
- English Name: 2-Phosphonobutane-1,2,4-tricarboxylic Acid
- CAS Number: 37971-36-1
- Formula: $C_7H_{11}O_9P$
- Molecular Weight: 270.13 g/mol
- Product Characteristics: High-efficiency organic phosphonic acid scale and corrosion inhibitor. Combines scale inhibition, corrosion resistance, and chelation properties. Effectively inhibits scale formation (calcium carbonate, calcium sulfate, calcium phosphate) and metal corrosion (steel, copper, aluminum). Stable at high temperature ($\leq 150^\circ\text{C}$) and wide pH range (2.0-10.0); biodegradable and environmentally friendly.

2. Technical Specifications (Industrial Standard)

| Item | Specification |
|---|---|
| Appearance | Colorless to pale yellow transparent liquid |
| Assay (as PBTCa) | $\geq 50.0\%$ |
| pH Value (1% Aqueous Solution, 25°C) | 1.5 - 3.0 |
| Phosphorus Content (as PO_4^{3-}) | $\geq 8.5\%$ |
| Density (25°C) | 1.28 - 1.35 g/cm ³ |
| Viscosity (25°C) | 20 - 50 mPa s |
| Heavy Metals (Pb) | $\leq 0.0005\%$ |
| Arsenic (As) | $\leq 0.0001\%$ |
| Iron (Fe) | $\leq 0.001\%$ |
| Temperature Stability | Stable at $\leq 150^\circ\text{C}$ (scale inhibition efficiency $\geq 90\%$) |

3. Product Advantages

- Dual Function: Simultaneous scale inhibition and corrosion resistance, reducing the need for multiple additives.
- Wide Adaptability: Effective in high-temperature, high-hardness, and high-alkalinity water systems.
- Long-Lasting Effect: Strong chelation with metal ions, maintaining efficiency for 7-14 days.
- Environmental Friendly: Biodegradable, low phosphorus content, compliant with global environmental standards.
- Compatibility: Compatible with other water treatment chemicals (polyacrylamide, zinc salts, bactericides).

4. Application Fields

- Industrial Circulating Water: Cooling water systems, boiler water, central air conditioning circulating water.

- Oilfield Water Treatment: Oilfield injection water, oil refining cooling water.
- Metallurgical Industry: Steel mill cooling water, non-ferrous metal smelting circulating water.
- Other Fields: Reverse osmosis (RO) system pretreatment, desalination plants, chemical processing water.

5. Usage Methods

- Dosage: 2-20 mg/L (adjust based on water quality and system conditions).
- Dilution: Dilute with water at 1:10-1:50 (product: water) before use; stir evenly.
- Addition Method: Continuously add via metering pump to the water inlet of the system; monitor water quality regularly to adjust dosage.
- Optimal Conditions: pH 2.0-10.0, temperature $\leq 150^{\circ}\text{C}$; avoid direct contact with strong bases.

6. Packaging & Storage

- Packaging Specifications: 25 kg HDPE drums, 200 kg HDPE drums, 1000 kg IBC totes (custom packaging available).
- Storage Conditions: Store in cool, dry, well-ventilated warehouse ($\leq 30^{\circ}\text{C}$); keep container tightly closed; avoid sunlight and high temperature; store separately from strong bases/oxidizing agents.
- Shelf Life: 12 months (unopened, specified conditions).
- Transportation: UN 3265 (Class 8 Corrosive Substance); transport in acid-resistant vehicles; avoid collision, leakage, and exposure to sunlight/rain.

7. Safety & Protection

- Corrosive; avoid direct contact with skin, eyes, and clothing.
- Operators must wear chemical safety goggles, face shield, nitrile rubber gloves, and acid-resistant clothing.
- In case of contact, rinse immediately with plenty of water for ≥ 15 minutes; seek medical attention if necessary.
- Do not ingest; if swallowed, rinse mouth with water and consult a doctor.

8. Quality Assurance

- Manufactured in accordance with ISO 9001 quality management system.
- Each batch is tested with a Certificate of Analysis (COA) to meet industrial standards.
- Provide technical support: dosage adjustment, water quality testing, and system optimization.