

Technical Data Sheet (TDS)

1. Product Overview

- Product Name: Hydroxyethylidene Diphosphonic Acid - English Name: Hydroxyethylidene Diphosphonic Acid (HEDP) - CAS Number: 2809-21-4 - Formula: $C_2H_8O_7P_2$ - Molecular Weight: 206.03 g/mol - Product Characteristics: High-purity organophosphonic acid water treatment agent with excellent corrosion and scale inhibition performance; strong chelating ability with calcium, magnesium, iron, zinc and other metal ions; good thermal stability (stable at 200°C); wide pH adaptation range (1.0-10.0); compatible with most water treatment agents (polycarboxylates, organic phosphonates, biocides); non-combustible, low volatility; suitable for multiple industrial water treatment and metal surface treatment applications.

2. Technical Specifications (Complies with GB/T 26324-2010)

Item	Specification
Appearance	Colorless to pale yellow transparent liquid, no mechanical
Purity (by Titration)	≥ 99.0%
Phosphorous Acid (H_3PO_3)	≤ 0.3%
Phosphoric Acid (H_3PO_4)	≤ 0.5%
pH Value (25°C, 1% Aqueous)	1.0-2.0
Density (25°C)	1.45-1.55 g/cm ³
Chloride (Cl^-) Content	≤ 0.01%
Heavy Metals (Pb) Content	≤ 0.0005%
Water Content	≤ 0.2%
Thermal Stability (200°C, 2h)	No obvious decomposition, corrosion inhibition rate ≥ 85%
Operating pH Range	1.0-10.0

3. Product Advantages

1. Excellent Corrosion & Scale Inhibition: Effectively inhibits corrosion of carbon steel, copper, aluminum, and stainless steel in cooling water systems; prevents scale formation (calcium carbonate, calcium sulfate, calcium phosphate) by chelating metal ions; corrosion inhibition rate ≥ 90% and scale inhibition rate ≥ 95% in industrial water systems. 2. Strong Metal Ion Chelation: Forms stable chelates with calcium, magnesium, iron, zinc, manganese and other metal ions (chelation constant $\geq 10^{15}$); prevents metal ion precipitation and scaling; can dissolve existing slight scale. 3. Good Thermal Stability: Stable at high temperature (200°C) and high pressure; no decomposition or loss of performance in boiler water and high-temperature cooling water systems; suitable for high-temperature industrial water treatment. 4. Wide pH Adaptation Range: Effective in acidic, neutral and slightly alkaline environments (pH 1.0-10.0); no need for additional pH adjustment in most water treatment systems; compatible with acid-base adjustment agents. 5. Good Compatibility: Compatible with other water treatment agents (polycarboxylate scale inhibitors, organic phosphonate corrosion inhibitors, quaternary ammonium salt biocides); no adverse reactions, can be used in combination to enhance overall water treatment effect. 6. Low Dosage & Cost-Saving: Effective dosage is 2-20 mg/L in water treatment systems; low usage cost, high cost-performance ratio; reduces water consumption and sewage discharge.

4. Application Fields

- Industrial Water Treatment: Corrosion and scale inhibitor for cooling water systems (power plants, chemical plants, oil refineries, steel mills), boiler water, circulating water, and oilfield water; prevents metal corrosion and scale formation, extends equipment service life. - Metal Surface Treatment: Chelating agent and detergent in metal cleaning and pickling solutions; removes



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metal oxide scale and rust; improves metal surface finish and corrosion resistance; used in electroplating industry as a brightener and chelating agent. - Detergent Industry: Additive in industrial detergents and cleaning agents; enhances dirt removal ability by chelating metal ions; prevents detergent scaling and improves cleaning effect. - Textile Printing and Dyeing: Auxiliary agent in textile printing and dyeing processes; chelates metal ions in water to prevent color fading and staining; improves dyeing uniformity and color fastness. - Other Fields: Paper industry (scale inhibitor for papermaking equipment); cosmetic industry (chelating agent for metal ions in raw materials); pharmaceutical industry (intermediate for drug synthesis).

5. Usage Methods

- Dosage (as pure product): - Industrial Water Treatment: 2-20 mg/L (based on water hardness and metal content); add continuously or intermittently; can be used alone or mixed with other water treatment agents (mixing ratio 1:1-1:3 with polycarboxylates). - Metal Surface Treatment: 50-200 mg/L in cleaning/pickling solution; soak metal parts for 10-30 minutes (temperature 20-60°C); rinse with water after treatment. - Detergent Industry: 0.1-0.5% (based on detergent total weight); add during detergent formulation. - Textile Printing and Dyeing: 10-50 mg/L in dyeing bath; add before dyeing. - Usage: For water-soluble systems (water treatment, textile printing and dyeing): Dilute the product with room temperature water (dilution ratio 1:10-1:20), stir evenly, then add to the system; for acid pickling systems: Mix with hydrochloric acid or sulfuric acid (add slowly to avoid heat release), then use. - Optimal Conditions: Use at temperature 0-200°C and pH 1.0-10.0; for high-hardness water systems (calcium ion content >500 mg/L), increase dosage by 30-50%; avoid mixing with strong bases and strong oxidants directly (dilute first if necessary). - Precautions: Do not overdose (may cause foaming in water systems);

6. Packaging & Storage

- Packaging Specifications: 25 kg HDPE drums (with inner seal); 200 kg HDPE drums (with inner seal); 1000 kg IBC tanks (acid-resistant); custom packaging available upon request. - Storage Conditions: Store in cool, dry, well-ventilated warehouse (5-35°C); keep container tightly closed to prevent leakage, contamination, and moisture absorption; avoid direct sunlight, high temperature (>50°C), and humidity (>80%); store separately from strong bases, strong oxidants, food-grade materials, and combustible materials; stack drums stably (no more than 2 layers) 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 discoloration (turning dark yellow), turbidity, or precipitation occurs. - Transportation: UN 3265 (Class 8 Corrosive Substances); transport in covered, acid-resistant vehicles; avoid collision, vibration, and impact; keep away from strong bases and strong oxidants during transport;

7. Safety & Protection

- The product is a corrosive acidic liquid, irritating to skin and eyes, toxic to aquatic organisms; non-combustible, no explosive hazards under normal conditions; reacts with strong bases to release heat. - Operators must wear full acid-resistant personal protective equipment: acid mist mask (N95 or equivalent), acid-resistant gloves (butyl rubber or fluororubber), safety goggles, face shield, and acid-resistant protective clothing; avoid skin and eye contact, and inhalation of mist. - Operate in well-ventilated area; install emergency eyewash stations and safety showers (acid-resistant) nearby; in case of leakage, follow accidental release measures to avoid environmental contamination (especially aquatic ecosystems).

8. Quality Assurance

- Manufactured in accordance with ISO 9001 quality management system standards; strictly controls raw materials (formaldehyde, phosphorous acid, hydrochloric acid), production processes (condensation, hydrolysis, purification), and finished product testing. - Each batch of product is strictly tested with a Certificate of Analysis (COA) to meet GB/T 26324-2010 and international quality standards, ensuring product purity, performance, and safety. - Provide professional technical support: customize dosage and application schemes based on user system parameters (water quality, equipment material, operating temperature); provide on-site guidance for product use, dosage adjustment, and problem-solving; solve industrial water treatment and metal surface treatment problems in a timely manner.