Technical Data Sheet (TDS)

1. Product Overview

- Product Name: 盐酸 - English Name: Hydrochloric Acid - CAS Number: 7647-01-0 - Formula: HCl - Molecular Weight: 36.46 g/mol - Product Characteristics: High-purity inorganic strong acid, colorless to pale yellow transparent liquid, pungent irritating odor, highly volatile and soluble in water (exothermic); excellent acidifying, corrosive and pickling properties; industrial-grade product meets GB/T 320-2023 and ASTM D1193 standards, high purity (≥31.0%), low impurity content; stable chemical properties under normal storage conditions, widely used in chemical synthesis, metal processing, pharmaceutical and water treatment fields; strong corrosivity and volatility require strict safety protection during use.

2. Technical Specifications (Complies with GB/T 320-2023 & ASTM D1193)

Item	Specification
Appearance	Colorless to pale yellow transparent liquid, no
Purity (HCl Content)	≥ 31.0%
Density (20℃, g/cm³)	1.15-1.18
Iron (Fe) Content	≤ 0.0005%
Heavy Metals (Pb)	≤ 0.0001%
Sulfate (SO_4^{2-}) Content	≤ 0.0005%
Free Chlorine (Cl_2)	≤ 0.0005%
Boiling Point (℃, 101.3	108.6 (31% solution)
Freezing Point (℃)	-46.2 (31% solution)

3. Product Advantages

1. Strong Alkaline Neutralization & Catalytic Properties: High HCl content (≥31.0%), excellent acidifying and neutralizing effects on alkaline substances; strong catalytic activity, suitable for various chemical synthesis reactions requiring strong acidic conditions (e.g., esterification, hydrolysis). 2. High Purity & Stable Quality: Ultra-low impurity content (Fe ≤0.0005%, Pb ≤0.0001%); no mechanical impurities, ensuring stable performance in high-precision applications (e.g., pharmaceutical intermediate, food-grade pH adjustment); stable quality batch-to-batch, meets strict industrial and international standards. 3. Wide Application Range: Effective at -20-150℃ and pH 0-7; suitable for chemical synthesis, metal pickling, pharmaceutical production, water treatment and food processing; compatible with most inorganic reagents (excluding strong bases, metals and oxidants) without mutual interference. 4. Excellent Pickling & Descaling Effect: Strong corrosivity to metal oxides, rust and scales; can quickly remove rust, oxide layers and scales from metal surfaces (steel, iron, copper) and industrial equipment (boilers, pipelines); pickling/descaling rate ≥95% at recommended dosage and temperature.

4. Application Fields

- Chemical Industry: Core raw material for chemical synthesis; production of dyes, detergents, pharmaceuticals, fertilizers (ammonium chloride), PVC and petrochemical products; catalyst for esterification, hydrolysis, neutralization and condensation reactions. - Metal Processing Industry: Metal pickling agent (removes rust and oxide layers from steel, iron, aluminum surfaces) to improve surface finish and adhesion of coatings; metal cleaning agent (removes oil, dirt and scale from metal parts); etching agent for printed circuit boards and metal components. - Pharmaceutical Industry: Intermediate for pharmaceutical synthesis (antibiotics, vitamins, analgesics); acidifying agent for drug formulations to improve drug solubility and stability;

laboratory reagent for pharmaceutical testing and analysis. - Water Treatment Industry: pH adjuster for acidic wastewater (neutralizes alkaline wastewater to pH 6-9); scale remover for circulating water systems (removes Ca/Mg scales from boilers and pipelines); coagulant aid to enhance flocculation effect of water treatment agents.

5. Usage Methods

- Dosage (Recommended): - Chemical Synthesis: 3-10% (based on reaction system weight), adjust according to reaction requirements; - Metal Pickling: 5-15% aqueous solution (diluted), soak metal parts for 10-30 minutes at 20-60℃; - Water Treatment (pH Adjustment): 50-300 mg/L (concentrated acid), adjust according to wastewater pH (target pH 6-9); - Food Processing (Food-grade): 0.1-0.5% aqueous solution, adjust according to product pH requirements. - Usage: 1. Dilution: Strictly follow "acid into water" principle (slowly add concentrated HCl to deionized water while stirring continuously, cool with cold water if necessary to prevent overheating and splashing); 2. Chemical Synthesis: Add diluted HCl to the reaction system slowly, control reaction temperature (≤100℃) to avoid violent reaction; 3. Metal Pickling: Immerse metal parts in diluted acid solution, stir occasionally, rinse with water thoroughly after pickling; 4. Water Treatment: Add concentrated acid to wastewater system through dosing pump continuously, monitor pH in real time. - Optimal Conditions: Use at temperature 20-80℃ and pH 0-7; higher temperature accelerates pickling/descaling rate; avoid using in strong alkaline environment (pH >9.0) to prevent neutralization and loss of efficacy.

6. Packaging & Storage

- Packaging Specifications: Industrial-grade: 500 mL glass bottles (laboratory use), 25 L PP drums (acid-resistant), 200 L steel drums with acid-resistant lining (large-scale use); food-grade: 25 L food -grade PP drums; custom packaging available upon request. - Storage Conditions: Store in a cool, dry, well-ventilated dedicated warehouse (temperature 5-30℃, relative humidity ≤75%); keep container tightly closed, store upright on acid-resistant shelves; avoid direct sunlight, heat sources (heaters, stoves) and moisture; store separately from strong bases, metals, oxidants and food-grade materials (separation distance ≥10 meters); stack drums stably (no more than 2 layers) to prevent tipping and leakage; install emergency eyewash stations, safety showers and acid-neutralizing equipment. - Shelf Life: 24 months (unopened, specified conditions); use promptly after opening, seal tightly after each use; do not use if discoloration (dark yellow), turbidity or precipitation occurs.

7. Safety & Protection

- The product is a highly corrosive and volatile strong acid, causes severe skin burns, eye damage and respiratory tract irritation; very toxic to aquatic organisms; oral ingestion may be fatal. - Operators must wear full personal protective equipment: acid gas respirator (P100/N95), chemical safety goggles, full-face shield, acid-resistant nitrile gloves (thickness ≥1.5 mm) and acid -resistant protective clothing/boots. - Operate in a well-ventilated workshop with local exhaust ventilation; avoid generating HCl gas mist during handling and dilution; no smoking, eating or drinking in the workplace; prepare emergency eyewash stations and safety showers nearby (within 10 meters) and acid-neutralizing equipment (lime, $NaHCO_3$). - In case of skin contact: Rinse with plenty of cold running water for at least 15 minutes immediately, seek emergency medical help. - In case of eye contact: Rinse with plenty of cold running water for at least 20 minutes immediately, seek emergency medical help.

8. Quality Assurance

- Manufactured in accordance with ISO 9001 quality management system standards; strictly controls raw materials (hydrogen chloride gas, deionized water), production processes (absorption, purification, concentration, packaging) and finished product testing; complies with national standards (GB/T 320-2023) and international standards (ASTM D1193). - Each batch of product is strictly tested with a Certificate of Analysis (COA), covering purity, appearance, density, iron content, heavy metals, sulfate and free chlorine content; ensures product quality is stable and meets customer requirements.