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Technical Data Sheet (TDS) - Phenol

Revision Date: 28 FEB 2026**CAS Number**: 108-95-2**Molecular Formula**: C_6H_6O**Molecular Weight**: 94.11 g/mol

1. Product Overview

Phenol is a high-purity industrial and reagent grade aromatic organic compound, a core raw material widely used in chemical synthesis, pharmaceutical manufacturing, rubber processing, and disinfection fields. It is a colorless crystalline solid at room temperature (melting point 41℃), easily deliquescent in air, and soluble in water, ethanol, ether and most organic solvents. With strong hydroxyl reactivity, it is a key intermediate for the synthesis of phenolic resin, bisphenol A, paracetamol and other products, and also has broad-spectrum bactericidal properties for disinfection applications. This product is produced with high-purity refining process, low impurity content and stable quality, meeting the strict requirements of industrial production and laboratory research.

2. Technical Specifications (Complies with Industrial & Reagent Grade Standards)

Item	Specification
Appearance	Colorless to pale pink clear crystalline solid (25℃)
Assay (on dry basis)	≥ 99.5%
Related Substances	Total ≤ 0.3%; Single Impurity ≤ 0.1%
Water Content	≤ 0.2%
Acidity (as H_2SO_4)	≤ 0.005%
Alkalinity (as NH_3)	≤ 0.001%
Heavy Metals (Pb)	≤ 2 ppm; (As) ≤ 0.5 ppm
Chloride (Cl^-)	≤ 0.001%
Sulfate (SO_4^{2-})	≤ 0.002%
Melting Point	40.5 ~ 42.5℃
Boiling Point	181 ~ 183℃
Flash Point	79℃ (Closed Cup)
Autoignition Temperature	715℃
Solubility	Soluble in water (8.3 g/100mL, 25℃); miscible with ethanol/ether/acetone
Density (liquid, 42℃)	1.071 g/cm³
Vapor Pressure (20℃)	0.4 mmHg
Refractive Index (n_{20} /D, liquid)	1.5418

3. Product Advantages

1. **High Purity & Low Impurity**: Assay ≥99.5%, ultra-low content of heavy metals and inorganic anions, no obvious coloration, suitable for high-precision synthesis and laboratory research.
2. **Stable Physical Properties**: Narrow melting/boiling point range, low water content, no deliquescence under sealed storage, easy to store and handle.
3. **High Reactivity**: Pure phenolic hydroxyl group with strong chemical reactivity, high conversion rate in synthesis reactions, no by-product interference.
4. **Multi-Scene Applicability**: Meets the quality requirements of industrial production, pharmaceutical intermediate synthesis, rubber antioxidant preparation and laboratory reagent use.
5. **Standardized Production**: Produced in accordance with ISO 9001 quality management system, each batch with complete COA test data, stable batch-to-batch quality.

4. Application Fields

Core Raw Material for Chemical & Pharmaceutical Industry:

- **Chemical Synthesis**: Production of phenolic resin, bisphenol A, epoxy resin, plasticizers and synthetic fibers; intermediate for organic synthesis of aromatic compounds.

- **Pharmaceutical Manufacturing**: Key intermediate for paracetamol, salicylic acid, phenobarbital and other drugs; raw material for veterinary medicine and disinfectant preparation.
- **Rubber & Plastic Industry**: Antioxidant and vulcanizing agent for rubber; plastic modifier and resin crosslinking agent.
- **Disinfection & Sanitation**: High-concentration phenol solution for industrial disinfection, medical device surface disinfection (diluted use).
- **Other Fields**: Laboratory analytical reagent; raw material for pesticide, dye and perfume synthesis; water treatment fungicide (diluted).

5. Usage Methods

Industrial Synthesis Application

- **Solid Direct Addition**: Add crystalline phenol directly to the reaction kettle at 40~60℃ (melting into liquid), stir and react with other raw materials (e.g., formaldehyde for phenolic resin synthesis); control reaction temperature ≤100℃ to avoid decomposition.
- **Solution Preparation**: Dissolve phenol in ethanol/ether (1:1 ratio) for low-temperature synthesis reactions; the aqueous solution (5~10%) can be used for mild catalytic reactions.

Disinfection & Reagent Application

- **Disinfection Solution**: Dilute with water to prepare 0.5~5% aqueous solution for surface disinfection of non-food contact equipment; avoid contact with metal and plastic materials for a long time.
- **Laboratory Reagent**: Weigh the solid phenol in a fume hood, prepare standard solution with distilled water or organic solvent, and seal for storage after preparation.

Key Operation Requirements

- Operate in a well-ventilated fume hood; avoid direct contact with skin and mucous membranes.
- Control the reaction system to avoid strong acid/strong base overdosage; avoid mixing with oxidants to prevent dangerous reactions.
- For large-scale use, adopt closed feeding equipment to reduce vapor volatilization.

6. Packaging & Storage

Packaging Specifications

- 500 g / brown glass sealed bottle (reagent grade, laboratory use)
- 25 kg / HDPE anti-corrosive sealed drum (industrial grade, small-batch use)
- 200 kg / carbon steel anti-corrosive sealed drum (industrial grade, bulk use)
- 1000 kg / IBC anti-corrosive tote (large-scale industrial production)

Storage Conditions

- **Storage Temperature**: 0 ~ 30℃, cool and dry warehouse; avoid high temperature (≥40℃) to prevent melting and volatilization.
- **Sealing Requirement**: Air-tight and moisture-proof sealing; fill with dry nitrogen for long-term storage to prevent oxidation and discoloration.
- **Incompatibilities**: Store separately from strong oxidants, strong acids, strong bases, halogens, organic amines and food raw materials.

7. Safety & Protection

- Wear **level C anti-corrosive PPE** during handling: nitrile rubber anti-corrosive gloves (thickness ≥0.2mm), chemical splash goggles, full face shield, anti-corrosive protective clothing and gas mask (organic vapor filter).
- In case of skin contact: Immediately rinse with plenty of running water and dilute acetic acid solution (5%) for 15~20 minutes; consult a doctor immediately if blistering or corrosion occurs.
- In case of eye contact: Immediately rinse with sterile normal saline for 20~30 minutes; remove contact lenses if worn; consult an ophthalmologist immediately.
- Do not ingest; accidental oral intake will cause severe gastrointestinal corrosion—rinse mouth with water, do not induce vomiting, and seek emergency medical treatment at once.
- All operations are carried out in a well-ventilated fume hood with anti-corrosive ground and emergency flushing equipment.