

Technical Data Sheet (TDS)

- Diphenyl Ether 二苯醚

Revision Date: 20 FEB 2026

1. Product Overview

- **Product Name:** Diphenyl Ether (二苯醚)
 - **English Name:** Diphenyl Ether; Phenyl ether; Benzene oxide
 - **CAS Number:** 101-84-8
 - **Molecular Formula:** C₁₂H₁₀ O
 - **Molecular Weight:** 170.21 g/mol
 - **Form:** Colorless to pale yellow clear liquid at room temperature; white crystalline solid at low temperature (≤25°C), faint aromatic odor
 - **Grade:** Industrial Grade / Flavor & Fragrance Grade / Synthetic Intermediate Grade
- Diphenyl Ether is a high-purity aromatic ether organic compound with excellent thermal stability, low volatility and good dissolving properties. It is a key raw material for organic synthesis, with stable physical and chemical properties under normal storage and use conditions, complying with EU REACH, US TSCA and Chinese industrial chemical standards. The product is widely used in organic synthesis intermediates, flavor fixatives, plastic plasticizers, flame retardant raw materials and daily chemical fragrance formulations, with reliable quality and consistent performance.

2. Technical Specifications (Complies with Industrial/Flavor Grade Standard)

Item	Specification
Appearance	Colorless-pale yellow clear liquid (25°C), no visible impurity
Assay (Diphenyl Ether)	≥ 99.0%
Melting Point	25 ~ 27°C
Boiling Point	257 ~ 259°C
Relative Density (25/25°C)	1.074 ~ 1.078 g/cm ³
Refractive Index (n ₂₀ ^D)	1.586 ~ 1.588
Water Content	≤ 0.1%
Residue on Ignition	≤ 0.05%
Heavy Metals (Pb)	≤ 5 ppm
Heavy Metals (As)	≤ 1 ppm
Chromatographic Purity	≥ 99.5%
Flash Point (Closed Cup)	≥ 110°C
Autoignition Temperature	≥ 620°C
Temperature Stability	Stable at 0 ~ 50°C (purity retention ≥ 99%)
Storage Stability	24 months unopened (under specified conditions), no discoloration or degradation

3. Product Advantages

1. **High Purity & Purity Consistency:** Assay ≥99.0%, chromatographic purity ≥99.5%, low impurity content, meets multi-industry application requirements.
2. **Excellent Thermal Stability:** High boiling point and autoignition temperature, no easy decomposition at high temperature (≤200°C), suitable for high-temperature synthesis reactions.
3. **Low Volatility:** Low vapor pressure at room temperature, less loss during use and storage, long-lasting effect in flavor and fragrance applications.
4. **Good Solubility:** Miscible with most organic solvents (ethanol, ether, benzene, toluene), insoluble in water, excellent dissolving property for organic compounds.
5. **Versatile Compatibility:** Compatible with plastics, resins, essential oils and synthetic intermediates, no adverse reaction with most organic materials.



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6. **Reliable Quality:** Manufactured by refined distillation process, stable product performance, batch-to-batch consistency.

4. Application Fields

- **Organic Synthesis Industry:** Key intermediate for synthesizing pharmaceuticals, pesticides, dyes, flame retardants (e.g., brominated diphenyl ether flame retardants) and other fine chemicals.
- **Flavor & Fragrance Industry:** High-grade fixative for daily chemical and food flavors, enhances fragrance persistence, used in perfume, soap, shampoo and food essence formulations.
- **Plastic & Rubber Industry:** Heat-resistant plasticizer and lubricant for engineering plastics (e.g., polycarbonate, nylon), improves product thermal stability and processability.
- **Chemical Manufacturing:** Solvent for high-temperature organic reactions, heat transfer medium in low-temperature heat exchange systems.
- **Other Fields:** Additive for synthetic lubricating oil, raw material for cosmetic raw material synthesis, analytical reagent for chemical testing.

5. Usage Methods

Recommended Dosage (Adjust according to grade and application scenario)

- **Organic Synthesis:** 5 ~ 30% of total reaction system (as intermediate/solvent), adjust according to reaction process.
- **Flavor & Fragrance:** 0.1 ~ 2.0% of total formulation (as fixative), compatible with other essential oils and fragrances.
- **Plastic & Rubber:** 1 ~ 5% of total polymer system (as plasticizer), melt and mix at processing temperature.
- **Chemical Solvent:** 10 ~ 50% of total system, suitable for high-temperature ($\leq 150^{\circ}\text{C}$) organic reaction dissolution.

Key Application Tips

1. **Mixing & Addition:** At room temperature, mix with organic solvents first and then add to the target system; for solid systems (plastics/rubbers), melt the product at $30 \sim 40^{\circ}\text{C}$ and then blend evenly with the base material.
2. **Temperature Control:** Avoid heating above 200°C for a long time to prevent slight thermal decomposition; avoid open fire during operation (combustible liquid).
3. **Solubility Note:** Insoluble in water, do not mix with aqueous systems directly; use cosolvents (e.g., ethanol, propylene glycol) for water-based flavor formulations to improve compatibility.
4. **Storage Matching:** Use airtight containers for the prepared formulations to prevent volatilization and contamination.

6. Packaging & Storage

Packaging Specifications (Sealed Industrial Grade Packaging)

- 500 mL brown glass bottle (inner) + carton (outer) (laboratory/R&D/small-batch use)
- 25 kg HDPE plastic drum (industrial grade/synthetic intermediate use)
- 200 kg galvanized iron drum (flavor grade/bulk industrial use)
- 1000 kg IBC tote (large-scale chemical manufacturing use)
- Custom packaging available according to customer requirements.

7. Safety & Protection

1. The product is a combustible liquid, which can cause skin and eye irritation; direct contact and inhalation of vapor should be avoided during operation.
2. **Recommended PPE:** Wear chemical splash goggles, nitrile rubber gloves, chemical-resistant protective clothing and anti-slip safety shoes for all operations; wear a half-face respirator with organic vapor filter for large-scale operation or poor ventilation.
3. **Accident Treatment:**
 - Skin Contact: Immediately remove contaminated clothing, rinse the affected area with plenty of running water for 15 ~ 20 minutes; consult a doctor if irritation, redness or blistering occurs.
 - Eye Contact: Immediately pry open the eyelids and rinse with plenty of clean running water for 15 ~ 20 minutes; remove contact lenses if present; consult an ophthalmologist immediately.