

Technical Data Sheet (TDS)

1. Product Overview

- **Product Name:** Silica Sol
- **English Name:** Silica Sol
- **CAS Number:** 112926-00-8
- **Formula:** $\text{SiO}_2 \cdot n\text{H}_2\text{O}$ (Amorphous Silica Hydrate)
- **SiO₂ Content:** 30.0 ± 0.5% (w/w)
- **Product Characteristics:** Colorless transparent colloidal liquid of amorphous silica nanoparticles (15 nm average size) dispersed in deionized water; stabilized with mild sodium hydroxide (pH 8.5–10.5); non-flammable, inert, mild alkaline; no skin irritation, minor eye irritation. Excellent binding, adhesive, and reinforcing properties; gelation in strong acids/freeze/high temperature; dried to form porous silica gel with high surface area. Industrial grade (30% SiO₂), low Na₂O/Fe₂O₃ impurities, high colloidal stability.

2. Technical Specifications

Item	Specification
Appearance	Colorless to pale blue transparent colloidal liquid
SiO ₂ Content (w/w)	29.5–30.5%
pH Value (25°C)	8.5–10.5
Average Particle Size	10–20 nm
Viscosity (25°C)	≤ 10 mPa·s
Density (25°C)	1.18–1.20 g/cm ³
Conductivity (25°C)	≤ 2000 μS/cm
Na ₂ O Content	≤ 0.3%
Fe ₂ O ₃ Content	≤ 0.005%
Heavy Metals (Pb)	≤ 5 ppm
Storage Stability (5–30°C)	≥18 months (no gelation/sedimentation)
Temperature Stability	Stable at 5–40°C (no gelation)

3. Product Advantages

1. **High Colloidal Stability:** 18-month shelf life at 5–30°C; no gelation/sedimentation; mild alkaline pH maintains nanoparticle dispersion.
2. **Ultra-Fine Particles:** 10–20 nm average particle size; high surface area for strong binding/reinforcing effects.
3. **Low Impurities:** Ultra-low Na₂O (≤0.3%) and Fe₂O₃ (≤0.005%); no heavy metal contamination – suitable for high-purity applications.
4. **Excellent Binding Property:** Strong adhesion to ceramics/metals/glass; high temperature resistance (up to 1050°C) after drying.
5. **Inert & Non-Toxic:** Amorphous silica is chemically inert; no acute toxicity; minor eye irritation only – safe for industrial handling.
6. **Versatile Compatibility:** Miscible with water; compatible with most inorganic binders/additives; customizable pH (6–11) upon request.
7. **High Temperature Resistance:** Dried silica binder retains strength at high temperatures (ceramic/foundry applications).

4. Application Fields

- **Foundry Industry:** Binder for silica sand molds/core; high strength, good collapsibility, no toxic fumes during casting.
- **Ceramic Industry:** Binder for ceramic green bodies; improves green strength and sintering density; suitable for porcelain/stoneware/ refractory ceramics.



NEWAY SINOPHC TECH. LIMITED

ADD:RM. 204, BUILDING 3, NO. 188, AONA RD., CHINA (SHANGHAI) PILOT FREE TRADE ZONE.
Email:marketing01@newayphc.com; Phone:+86-021-50350029 <https://www.newayphc.com>

- **Coatings & Paints:** Additive for water-based coatings; improves scratch resistance, hardness, and weatherability; anti-corrosive coating for metals.
- **Catalyst Support:** High surface area silica gel (from silica sol) as support for chemical catalysts (petrochemical/ environmental).
- **Metal Polishing:** Abrasive for high-precision metal polishing (stainless steel, aluminum); no scratch, high gloss finish.
- **Textile Industry:** Sizing agent for cotton/synthetic fabrics; improves fabric strength and wrinkle resistance.
- **Paper Industry:** Coating additive; improves paper smoothness, printability, and water resistance.
- **Water Treatment:** Coagulant aid for wastewater; adsorbs heavy metal ions and suspended solids.
- **Other:** Adhesive for glass products, refractory material binder, battery electrode additive (silica coating for Li-ion batteries).

5. Usage Methods

- **Foundry Binder:** Mix silica sol with silica sand (3–8% w/w sand); mix evenly; mold and air dry at 25–30°C for 24h (or heat dry at 80–100°C for 2–4h); green strength ≥ 2 MPa after drying.
- **Ceramic Binder:** Add 5–15% silica sol to ceramic powder (kaolin/quartz); mix to form slurry; cast/mold and dry at 60–80°C; sinter at 900–1200°C (high sintering density).
- **Coating Additive:** Add 1–5% silica sol to water-based coating; stir evenly (no high-speed mixing); improves scratch resistance/hardness (dried film pencil hardness $\geq 2H$).
- **Metal Polishing:** Dilute silica sol to 10–15% SiO₂ with deionized water; apply to metal surface with polishing cloth; polish at low speed (500–1000 rpm) for high gloss finish.
- **Optimal Conditions:** Use at 5–30°C; avoid mixing with strong acids (pH <4) or freezing; stir gently before use (no high-speed mixing); seal tightly after use to prevent evaporation.

6. Packaging & Storage

- **Packaging:** 20 kg HDPE plastic drums, 200 kg HDPE drums, 1000 kg IBC totes (sealed, food-grade inner liner); customized packaging (5 kg/10 kg) available upon request.
- **Storage:** Cool, well-ventilated warehouse (5–30°C); store in sealed, upright drums; avoid direct sunlight/high temperature (>40°C)/freezing (<0°C); do not mix with strong acids/salts.
- **Shelf Life:** 18 months (unopened, 5–30°C); 6 months after opening (seal tightly, store at the same conditions).
- **Transportation:** Non-hazardous goods; transport at 5–30°C; avoid freezing/collision/high temperature; no special transport regulations – ordinary truck transport is acceptable.

7. Safety & Protection

- Wear safety goggles during routine handling (minor eye irritation risk); nitrile gloves/face shield for bulk transfer/spills.
- N95 dust mask is only required if liquid evaporates to form silica dust (e.g., high temperature operation); no respirator needed for normal liquid handling.
- In case of eye contact, rinse with plenty of water for 10–15 mins; consult a doctor if irritation persists.
- Do not mix with strong acids (causes gelation); if gelation occurs, collect residue and dispose as non-hazardous waste.
- No eating/drinking/smoking in work area; wash hands after handling (routine hygiene).

8. Quality Assurance

- Manufactured under ISO 9001 quality management system; strict quality control for particle size, SiO₂ content, and impurities.
- Each batch is tested and accompanied by a COA; customized specifications (SiO₂ content 10–40%, pH 6–11, particle size 5–50 nm) available upon request.
- Provide technical support for application optimization (mixing ratio, drying temperature, binding strength improvement).
- Long-term after-sales service: on-site technical guidance for large-scale industrial applications (foundry/ceramic coatings).