

Technical Data Sheet (TDS)

1. Product Overview

- **Product Name:** Kaolin
- **English Name:** Kaolin
- **CAS Number:** 1332-58-7
- **Formula:** $\text{Al}_2\text{O}_3 \cdot 2\text{SiO}_2 \cdot 2\text{H}_2\text{O}$ (Hydrated Aluminum Silicate)
- **Molecular Weight:** 258.16 g/mol
- **Product Characteristics:** Natural hydrated aluminum silicate mineral, white to off-white fine crystalline powder with neutral pH, high whiteness and low impurity content. Non-combustible, chemically stable, excellent plasticity, suspension and covering properties. Insoluble in water and weak acids/bases, only soluble in concentrated strong acids. Good filling, reinforcing and coating effects for polymers and industrial materials. Stable under normal storage conditions, slight caking in high humidity (easily re-dispersed). Suitable for ceramic, papermaking, coating, rubber, plastic and cosmetic applications. Non-toxic to the environment, 36-month shelf life in sealed dry conditions.

2. Technical Specifications (Industrial Grade)

Item	Specification
Appearance	White to off-white fine crystalline powder
Al_2O_3 Content	$\geq 38.0\%$
SiO_2 Content	45.0-50.0%
Fe_2O_3 Content	$\leq 0.5\%$
TiO_2 Content	$\leq 0.3\%$
Moisture Content	$\leq 0.3\%$
Ash Content	$\leq 0.1\%$
Particle Size (D50)	2-8 μm
pH Value (5% aq. suspension)	6.0-8.0
Whiteness (CIE)	$\geq 85\%$
Heavy Metals (Pb)	≤ 5 ppm
Acid Soluble Matter	$\leq 1.0\%$
Density (25°C)	2.60-2.65 g/cm ³
Bulk Density	0.7-1.1 g/cm ³
Oil Absorption Value	20-30 g/100g
Solubility	Insoluble in water; soluble in concentrated HF/hot mineral acids

3. Product Advantages

1. **High Purity & Low Impurities:** 99.8% purity with ultra-low heavy metal (Pb), iron oxide (Fe_2O_3) and titanium oxide (TiO_2) impurities; ensures stable performance in industrial applications.
2. **Excellent Physical Properties:** High whiteness ($\geq 85\%$ CIE), uniform particle size distribution, good plasticity and suspension; improves product quality and processing efficiency.
3. **Versatile Functional Performance:** Excellent filling, reinforcing and coating effects; suitable for multiple application scenarios with different processing requirements.
4. **Good Chemical Stability:** Neutral pH, stable under normal storage/processing conditions; no reaction with most organic/inorganic raw materials (excluding concentrated strong acids).
5. **Good Compatibility:** High compatibility with ceramic, papermaking, coating, rubber and plastic raw materials; no adverse effect on product performance, improves product hardness and wear resistance.
6. **Long Storage Life:** 36-month shelf life in sealed dry conditions; slight caking in high humidity (easily re-dispersed), no degradation, suitable for long-term storage and transportation.

4. Application Fields



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- **Ceramic Industry:** Core raw material for ceramic tiles, sanitary ware, porcelain and ceramic insulators; improves plasticity, green body strength and glaze smoothness; reduces firing shrinkage; addition amount 20-60% (w/w).
- **Papermaking Industry:** Filler and coating for cultural paper, packaging paper and coated paper; improves paper smoothness, whiteness, printability and opacity; reduces paper brittleness; addition amount 10-30% (w/w).
- **Coating & Paint Industry:** Filler for water-based/oil-based coatings, industrial paints and architectural coatings; improves film hiding power, scratch resistance and weather resistance; reduces pigment usage; addition amount 5-20% (w/w).
- **Rubber & Plastic Industry:** Filler for natural rubber/synthetic rubber and plastics (PP/PE/PVC); improves product rigidity, dimensional stability and wear resistance; reduces production cost; addition amount 5-15% (w/w).
- **Cosmetic Industry:** Excipient for face powder, foundation, mask and skin care products (cosmetic grade); improves product texture, oil absorption and spreadability; mild and non-irritating to skin.
- **Other Fields:** Refractory material for metallurgy; catalyst carrier for chemical industry; adsorbent for water treatment; raw material for cement and concrete.

5. Usage Methods

- **Ceramic Production:** Mix kaolin with other ceramic raw materials (quartz, feldspar, clay) in proportion (20-60%); grind to fine powder (D90 <20 μ m) with ball mill; adjust plasticity with water; form green body and fire at 1100-1400 $^{\circ}$ C.
- **Papermaking Coating/Filler:** Disperse kaolin in water with dispersant (0.3-0.8% w/w) to form slurry (solid content 50-60%); apply as coating on paper surface or add directly to pulp as filler; dry at 80-100 $^{\circ}$ C.
- **Coating Filler:** Disperse kaolin in coating base material (water/resin) with sand mill (D90 <10 μ m); mix with pigment and additives evenly; adjust coating viscosity with solvent/water before application.

6. Packaging & Storage

- **Packaging Specifications:** 25 kg coated woven bags (with PE inner liner), 50 kg HDPE drums, 1000 kg FIBC (flexible intermediate bulk containers, dust-proof); cosmetic grade in sealed aluminum foil bags; customized packaging available upon request.
- **Storage Conditions:** Cool, dry, well-ventilated warehouse ($\leq 30^{\circ}$ C, humidity $\leq 75\%$ RH); store in sealed packaging; avoid direct sunlight, rain and high humidity; keep away from concentrated strong acids, food and medicines (industrial grade); store cosmetic/food grade in a dedicated clean area.
- **Shelf Life:** 36 months (unopened, specified conditions); 12 months after opening (seal tightly with plastic wrap/tape and keep dry; re-disperse if caking occurs).

7. Safety & Protection

- **Mandatory PPE:** Wear chemical splash goggles, N95 dust mask, nitrile gloves and full protective suit for all handling operations; face shield and PAPR for bulk processing/spills.
- **Dust Control:** Operate in well-ventilated area with local exhaust ventilation and dust collection system; use wet processing to reduce dust generation; eliminate all ignition sources to prevent dust explosion.
- **Handling Precautions:** Avoid dust inhalation and eye/skin contact; wash hands/face thoroughly with soap and water after handling; no eating/drinking/smoking in the work area; change contaminated clothing in a dedicated area.

8. Quality Assurance

- Manufactured under ISO 9001 (quality) and ISO 14001 (environmental) management systems; strict raw material inspection and production process control.
- Each batch is tested for chemical composition, physical properties and impurity content; accompanied by a Certificate of Analysis (COA) to ensure compliance with industrial standards.
- Customized products available: cosmetic/food grade, ultra-fine grade (D50 1-2 μ m), high-whiteness grade ($\geq 90\%$ CIE) and high-plasticity grade; suitable for different application scenarios.