Technical Data Sheet (TDS)

1. Product Overview

- Product Name: Aluminum Nitride
- English Name: Aluminum Nitride
- CAS Number: 24304-00-5
- Formula: AlN
- Molecular Weight: 40.99 g/mol
- Product Characteristics: High-purity white fine powder, excellent thermal conductivity, electrical insulation, and high-temperature stability. Chemically stable under normal conditions, suitable for high-performance ceramic and electronic applications.

2. Technical Specifications

Item	Specification
Appearance	White to pale gray fine powder
Purity (AlN)	≥ 98.0%
Al Content	65.0-66.0%
Oxygen (O)	≤ 1.5%
Carbon (C)	≤ 0.3%
Iron (Fe)	≤ 0.1%
Heavy Metals (Pb)	≤ 0.001%
Particle Size	1-10 μm
Thermal Conductivity (25℃)	180-200 W/(m·K)
Density (25℃)	3.26 g/cm³
Melting Point (N_2 atmosphere)	2200℃
Electrical Resistivity (25℃)	≥ 1×10^{14} Ω·cm

3. Product Advantages

- High thermal conductivity and electrical insulation for electronic packaging.
- Excellent high-temperature stability (resistant to oxidation up to 1300℃).
- Low thermal expansion coefficient, compatible with semiconductor materials.
- High purity and uniform particle size ensure consistent performance.

4. Application Fields

- Electronic Packaging: Substrates for power semiconductors, LED packaging, thermal management materials.
- Ceramic Materials: High-temperature structural ceramics, refractory bricks, crucibles.
- Composite Materials: Reinforcement for metals, polymers, and ceramics (improves thermal conductivity).
- Semiconductors: Substrates for gallium nitride (GaN) devices, semiconductor manufacturing.
- Other: Thermal interface materials, high-temperature lubricants, cutting tools.

5. Usage Methods

- Ceramic Production: Mix with binders (5-10%), press molding, sinter at 1700-1900℃ under nitrogen atmosphere.
- Electronic Packaging: Sinter into substrates or mix with epoxy resin to make thermal conductive adhesives.
- Composite Materials: Add 10-30% to base material, mix uniformly via mechanical or chemical methods.
- Optimal Conditions: Use at 20-35℃; avoid contact with strong acids and high temperatures in presence of water.

6. Packaging & Storage

- Packaging Specifications: 10 kg/bag (plastic-lined kraft bag), 25 kg/drum (HDPE), 1000 kg/IBC tote.
- Storage Conditions: Store in cool, dry, well-ventilated warehouse. Avoid moisture and direct sunlight. Temperature ≤ 30℃.
- Shelf Life: 36 months (unopened).
- Transportation: Handled as non-dangerous goods; avoid collision and moisture.

7. Safety & Protection

- Wear dust mask, protective gloves, and safety goggles during handling.
- Avoid dust inhalation and eye contact; rinse immediately if contact occurs.
- Keep away from strong acids and high-temperature environments.

8. Quality Assurance

- Manufactured under ISO 9001 quality management system.
- Each batch accompanied by COA.
- Provide technical support for sintering and application processes.