Aerospace-Grade Talc Powder — A-A-59303B Compliant

1. Product Overview

Aerospace-Grade Talc Powder is a high-purity, lamellar magnesium silicate engineered to meet the requirements of **A-A-59303B military specification**. Its controlled particle morphology, low impurity profile, and consistent mineral composition make it suitable for regulated aerospace polymer, elastomer, and coating systems requiring predictable mechanical, thermal, and fire-performance behavior.

This material supports qualification pathways for commercial aviation, defense programs, and space-system manufacturing where traceability, conformity, and batch reproducibility are essential.

2. Regulatory & Specification Compliance

- **A-A-59303B Military Specification** (Fully compliant)
- **FAR 25.853** Fire, Smoke & Toxicity (FST) support when used in compliant formulations
- **OEM aerospace material specifications** (compatibility dependent on formulation)
- **AS9100-aligned quality system** (manufacturer dependent)
- **REACH & RoHS compliant**
- **Low-VOC and halogen-free**

This compliance profile supports documentation requirements for FAA/EASA certification packages and defense procurement audits.

3. Chemical Composition

Typical mineral composition (approximate values):

- **Talc ($Mg_3Si_4O_{10}(OH)_2$):** 90–98%
- **Magnesium oxide (MgO):** Trace
- **Silicon dioxide (SiO_2):** Trace (non-crystalline)
- **Carbonates:** <2%
- **Iron oxide:** <0.5%
- **Moisture:** <0.5%

Free crystalline silica content meets A-A-59303B limits and is controlled for aerospace safety requirements.

4. Physical Properties

Property	Typical Value	Test Method
Appearance	White to off-white powder	Visual
Particle Size (D50)	5–12 µm (grade dependent)	Laser diffraction
Specific Gravity	2.7–2.8	ASTM D153
Oil Absorption	30–40 g/100 g	ASTM D281
Mohs Hardness	1	Standard
pH (10% slurry)	8.5–9.5	ASTM D1293
Loss on Ignition (LOI)		ASTM D7348
Bulk Density	0.35–0.55 g/cm³	ASTM D1895

Particle size distribution is tightly controlled to meet A-A-59303B uniformity requirements.

5. Key Performance Characteristics

Mechanical Reinforcement

- Increases modulus and stiffness-to-weight ratio in polymer systems
- Enhances creep resistance and dimensional stability
- Improves compression and tear resistance in elastomers

Thermal & Environmental Stability

- Low coefficient of thermal expansion supports tight-tolerance components
- Stable under heat-aged conditions
- Contributes to improved FST behavior in compliant formulations

Processing Advantages

- Improves flow in injection molding and extrusion
- Reduces warpage and shrinkage
- Enhances surface finish for visible interior components

6. Aerospace Application Areas

Polymers & Composites

- Aircraft interior panels
- Ducting and housings
- Trim and structural polymer components
- Thermoplastic and thermoset systems

Rubber & Elastomers

- Seals and gaskets
- Vibration-damping components
- Heat-resistant elastomeric parts

Coatings

- Abrasion-resistant coatings
- Environmental barrier coatings
- Primers and functional surface systems

7. Handling & Storage

- Store in a dry, covered environment to prevent moisture uptake.
- Avoid airborne dust generation; use appropriate ventilation.
- Shelf life is **indefinite** when stored under recommended conditions.

8. Packaging

Available in:

Custom packaging options for aerospace programs - 2 kg to 5 kg

All packaging supports traceability and batch identification.

9. Quality Assurance

- Manufactured under an aerospace-aligned quality system (AS9100 or equivalent).
- Full batch traceability and Certificate of Conformance (C o C) available.
- Lot-specific particle size and purity testing performed.

10. Safety & Regulatory Notes

- Non-flammable, chemically inert mineral.
- Safety Data Sheet (SDS) available upon request.
- Handle in accordance with standard industrial hygiene practices.