

Technical Data Sheet: Manganese Dioxide for Aerospace Sealant Formulations

Header Information

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1. Product Description

Manganese dioxide (MnO_2) for aerospace sealant formulations is a high-purity curing agent specifically designed for use in polysulfide sealants. These sealants are critical for aircraft structures and fuel systems, providing robust and reliable sealing under extreme aerospace conditions. With a typical purity ranging from 90% to 98%, this MnO_2 material facilitates the oxidative curing of thiol-terminated polymers, ensuring stable elastomeric performance. It is widely employed in sealants for aircraft fuselage joints, fuel tanks, and structural bonding applications.

2. Key Features

- Efficient Oxidative Curing Agent:** MnO_2 effectively promotes the crosslinking of thiol-terminated polysulfide polymers through oxidation reactions, leading to rapid and complete curing.
- Stable Curing Performance:** The controlled particle size and surface area of the MnO_2 ensure consistent reaction kinetics, contributing to predictable and stable curing during sealant formulation.
- High Chemical Stability:** This material exhibits excellent resistance to aviation fuel, lubricants, and other aggressive chemicals commonly encountered in

aerospace environments, ensuring long-term sealant integrity.

- **Low Impurity Levels:** Minimizing unwanted side reactions, the low impurity content of the MnO₂ enhances sealant durability and performance.
- **Reliable Aerospace Performance:** Optimized for aerospace sealant formulations, this manganese dioxide ensures reproducible curing characteristics and superior mechanical strength, vital for critical aircraft applications.

3. Technical Specifications

The following table outlines the typical technical parameters for Manganese Dioxide for Aerospace Sealant Formulations:

Parameter	Typical Value
MnO ₂ Purity	90–98%
Particle Size (D50)	2–10 µm
Surface Area	30–80 m ² /g
Moisture	≤0.5%
Bulk Density	0.6–1.0 g/cm ³
Crystal Phase	Pyrolusite (γ/β MnO ₂ mixture)

4. Applications

Manganese Dioxide for Aerospace Sealant Formulations is utilized in a variety of demanding aerospace applications:

- **Aircraft Fuel Tank Sealants:** The MnO₂ curing systems produce polysulfide elastomers with exceptional resistance to aviation gasoline and jet fuel, crucial for preventing leaks and ensuring fuel system integrity.
- **Fuselage and Structural Joint Sealing:** The cured polysulfide sealant maintains excellent elasticity and adhesion on aluminum and titanium structures, accommodating aircraft movement and thermal expansion.

- **Aircraft Window and Canopy Sealing:** MnO₂-cured polysulfide sealants provide durable and weather-resistant bonding for acrylic and glass aircraft transparencies.
- **Corrosion-Inhibitive Aircraft Sealants:** This manganese dioxide aids in creating resilient barriers that protect aluminum alloys from corrosion, extending the lifespan of aircraft components.
- **Fuel-Resistant Sealing Systems:** The oxidative curing mechanism forms strong disulfide crosslinks, imparting long-term resistance to various fuels and oils, essential for aerospace operational safety.

5. Packaging & Supply

- **Standard Packaging:** The product is supplied in 25 kg fiber drums, each equipped with a polyethylene (PE) inner liner to ensure product integrity and protection.
- **Export-Ready Packaging:** All packaging is designed to meet international shipping standards, facilitating global distribution.
- **Laboratory Samples:** 1–5 kg laboratory samples are available for research and development purposes, allowing for sealant formulation testing and validation.