

# Technical Data Sheet (TDS)

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## Manganese Dioxide for Soil Remediation in Contaminated Sites

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### 1. Product Description

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Manganese Dioxide for Soil Remediation in Contaminated Sites is a high-purity  $MnO_2$  material specifically engineered for environmental treatment and pollutant oxidation. With a typical  $MnO_2$  purity ranging from 90% to 95%, this product functions as a strong oxidizing agent capable of effectively degrading a wide range of organic contaminants and immobilizing heavy metals in polluted soils. Its robust chemical properties and controlled physical characteristics make it an ideal solution for various environmental cleanup operations, contributing to the restoration of contaminated land and groundwater.

### 2. Technical Specifications

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The following table outlines the key technical parameters of Manganese Dioxide for Soil Remediation in Contaminated Sites:

Parameter	Typical Value
MnO <sub>2</sub> Purity	90–95%
Particle Size	5–45 μm
Surface Area	30–60 m <sup>2</sup> /g
Moisture	≤1.0%
Bulk Density	0.7–1.0 g/cm <sup>3</sup>
Crystal Phase	Predominantly γ-MnO <sub>2</sub>

### 3. Key Features

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- **High Oxidation Capacity:** Exhibits strong oxidizing power for the effective degradation of chlorinated organics, petroleum-related pollutants, and other recalcitrant organic compounds in soil matrices.
- **Stable Crystal Structure:** Possesses a stable crystal structure that ensures consistent catalytic activity and long-term performance across large-scale remediation projects.
- **High Surface Area:** The large surface area (30–60 m<sup>2</sup>/g) significantly improves contact efficiency between MnO<sub>2</sub> particles and soil contaminants, accelerating reaction kinetics.
- **Controlled Particle Size Distribution:** A particle size range of 5–45 μm allows for effective dispersion and optimal contact within various soil treatment processes, enhancing remediation efficiency.
- **Reliable Oxidation Performance:** Provides consistent and dependable oxidation performance, crucial for achieving environmental cleanup objectives in diverse contaminated environments.
- **Low Impurity Content:** Minimizes the risk of secondary contamination during soil treatment, ensuring that the remediation process itself does not introduce new environmental concerns.

## 4. Applications

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Manganese Dioxide for Soil Remediation in Contaminated Sites is widely applied in:

- **Contaminated Site Remediation:** Effectively oxidizes organic pollutants such as phenols, hydrocarbons, and certain chlorinated compounds present in contaminated soil and groundwater.
- **Heavy Metal Stabilization:** Promotes the conversion of soluble and mobile heavy metal species into less mobile oxidation states, thereby immobilizing toxic metal ions and reducing their bioavailability.
- **Groundwater Treatment Zones:** Utilized in permeable reactive barriers (PRBs) to degrade dissolved contaminants as groundwater flows through the treatment zone.
- **Industrial Site Cleanup:** Supports the oxidation and removal of persistent organic compounds in legacy manufacturing areas and other industrial brownfield sites.
- **Environmental Remediation Projects:** Enhances pollutant degradation efficiency in engineered soil treatment systems, contributing to comprehensive environmental restoration efforts.

## 5. Packaging & Supply

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Standard packaging for Manganese Dioxide for Soil Remediation in Contaminated Sites includes **25 kg fiber drums or multi-layer paper bags with inner PE liners**. This packaging is designed to effectively prevent moisture absorption and maintain product integrity during storage and transport. Export packaging options are available, specifically tailored for international shipping and palletized loading, ensuring compliance with global logistics standards. Additionally, **laboratory samples** are provided for environmental testing and pilot remediation trials, allowing customers to thoroughly evaluate the product's performance in their specific contaminated matrices.