Technical Data Sheet

Porous Manganese Dioxide for Heavy Metal Adsorption

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1. Product Description

Porous Manganese Dioxide for Heavy Metal Adsorption is a high-surface-area MnO_2 material specifically engineered for the efficient removal of dissolved metal ions from industrial wastewater. Characterized by its high MnO_2 purity (85–95%) and a carefully controlled pore structure, this material offers robust adsorption and oxidation capabilities. It is particularly well-suited for deployment in fixed-bed and pressure filtration systems, providing an effective solution for environmental remediation.

2. Key Features

- **High Specific Surface Area:** Designed with an elevated specific surface area, which significantly enhances its capacity for heavy metal ion adsorption.

- **Stable Porous Structure:** Possesses a stable and consistent porous structure, ensuring reliable and consistent hydraulic performance in various treatment systems.

- **Strong Oxidative Capacity:** Exhibits a potent oxidative capacity, making it highly effective in treating Fe^{2+}, Mn^{2+}, and other transition metals through oxidation.

- **Low Dissolution Rate:** Demonstrates a low dissolution rate under neutral and weak acidic conditions, contributing to its longevity and stability in diverse aquatic environments.

- **Versatile System Compatibility:** Suitable for integration into continuous filtration and regeneration systems, offering flexibility in operational setups.

- **High Loading Capacity:** Supports a high loading capacity within compact reactors, optimizing space and efficiency in treatment processes.

3. Technical Specifications

Parameter	Typical Range
MnO_2 Content	85–95 %
Apparent Density	0.9–1.2 g/cm³
Bulk Density	0.6–0.8 g/cm³
BET Surface Area	80–180 m²/g
Average Pore Size	5–25 nm
Particle Size	0.5–2 mm (granular) / 50–200 mesh (powder)
Moisture Content	$\leq$ 5 %
Crushing Strength (granules)	$\geq$ 40 N
pH Stability Range	3–10

4. Applications

Porous Manganese Dioxide is widely applicable across various environmental treatment scenarios:

- **Industrial Wastewater Treatment:** Highly effective in the removal of heavy metal ions such as Lead (Pb), Copper (Cu), Zinc (Zn), Nickel (Ni), and Cadmium (Cd) from industrial effluents.

- **Groundwater Remediation:** Utilized for the reduction of dissolved iron and manganese through catalytic oxidation processes in groundwater treatment.

- **Electroplating Effluent Treatment:** Efficiently adsorbs residual heavy metals present in electroplating wastewater, aiding in compliance with discharge regulations.

- **Mining Wastewater Treatment:** Contributes to the stabilization and removal of toxic metal ions found in mining wastewater.
- **Drinking Water Pretreatment:** Serves as a catalytic media for the removal of iron and manganese during the pretreatment phase of drinking water purification.

5. Packaging & Supply

Our Porous Manganese Dioxide is available in various packaging options to meet diverse logistical and storage requirements:

- **25 kg Woven Bags:** Supplied in durable woven bags equipped with an inner PE liner for enhanced protection.
- **500 kg / 1000 kg Jumbo Bags:** Available in large jumbo bags for bulk handling and transportation.
- **Moisture-Proof Export Packaging:** All packaging is designed to be moisture-proof, ensuring product integrity during international shipping.
- **Palletized and Container-Loaded:** Products are palletized and loaded into containers for secure and efficient bulk shipments.

6. Customization & Technical Support

BTLnewmaterial offers customization options for particle size distribution, pore structure, and MnO_2 content to align with specific adsorption capacity and hydraulic performance requirements. Comprehensive technical data sheets, pilot testing support, and application guidance are readily available to facilitate seamless engineering integration and system optimization for our clients.