SAFETY DATA SHEET

Product Name: Regeneration-free Manganese Dioxide Filter Media **Revision Date:** 2026-02-11

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

- **Product Name:** Regeneration-free Manganese Dioxide Filter Media
- **Chemical Name:** Manganese Dioxide (MnO_2)
- **CAS No.:** 1313-13-9
- **EC No.:** 215-202-6

1.2 Relevant identified uses of the substance or mixture and uses advised against

- **Identified uses:** Water treatment filter media for the removal of iron, manganese, and hydrogen sulfide.
- **Uses advised against:** No specific uses advised against are identified.

1.3 Details of the supplier of the safety data sheet

- **Company Name:** BTLnewmaterial
- **Address:** Room 706, No. 154, Wuyi East Road, Niezhou Residential Committee, Caizichi Sub-district Office, Leiyang City, Hengyang City, Hunan Province, China
- **Email:** lixifirm@outlook.com
- **Phone/WhatsApp:** +8618273793022
- **Website:** manganesesupply.com

1.4 Emergency telephone number

- **Emergency Phone:** +8618273793022 (General Business Hours)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification (Globally Harmonized System):

- **Acute toxicity, Oral (Category 4):** H302 - Harmful if swallowed.
- **Acute toxicity, Inhalation (Category 4):** H332 - Harmful if inhaled.
- **Specific target organ toxicity - repeated exposure (Category 2):** H373 - May cause damage to organs (Brain) through prolonged or repeated exposure if inhaled.

2.2 GHS Label elements, including precautionary statements

Pictogram:


GHS07 - Exclamation Mark


GHS08 - Health Hazard

Signal Word: Warning

Hazard Statement(s):

- H302 + H332: Harmful if swallowed or if inhaled.
- H373: May cause damage to organs (Brain) through prolonged or repeated exposure if inhaled.

Precautionary Statement(s):

- **Prevention:**
  - P260: Do not breathe dust/fume/gas/mist/vapours/spray.
  - P264: Wash skin thoroughly after handling.
  - P270: Do not eat, drink or smoke when using this product.

    - P271: Use only outdoors or in a well-ventilated area.
- **Response:**
    - P301 + P312 + P330: IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
    - P304 + P340 + P312: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
    - P314: Get medical advice/attention if you feel unwell.
- **Disposal:**
    - P501: Dispose of contents/container in accordance with local/regional/national/international regulations.

2.3 Other hazards

- **Potential Health Effects:** Prolonged exposure to manganese dust can lead to manganism, a neurological disorder.
- **Environmental Hazards:** Not considered harmful to aquatic life at typical concentrations. However, avoid uncontrolled release into the environment.

SECTION 3: Composition/information on ingredients

3.1 Substances

- **Chemical Name:** Manganese Dioxide
- **Synonyms:** Manganese(IV) oxide, Pyrolusite
- **CAS No.:** 1313-13-9
- **EC No.:** 215-202-6
- **Concentration:** 75-85% (as MnO_2)

3.2 Mixtures

Not applicable (product is primarily a substance with minor impurities).

SECTION 4: First aid measures

4.1 Description of first aid measures

- **General advice:** Consult a physician. Show this safety data sheet to the doctor in attendance.
- **If inhaled:** If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
- **In case of skin contact:** Wash off with soap and plenty of water. Consult a physician.
- **In case of eye contact:** Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
- **If swallowed:** Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

- **Acute:** Harmful if swallowed or inhaled. May cause irritation to eyes, skin, and respiratory tract.
- **Delayed:** Prolonged or repeated inhalation exposure may cause damage to the brain and central nervous system, leading to manganism symptoms such as neurological disorders, tremors, and psychological disturbances.

4.3 Indication of any immediate medical attention and special treatment needed

- **Treatment:** Symptomatic treatment and supportive therapy as indicated. Monitor for neurological effects in cases of prolonged exposure.

SECTION 5: Firefighting measures

5.1 Extinguishing media

- **Suitable extinguishing media:** Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
- **Unsuitable extinguishing media:** No specific unsuitable extinguishing media identified.

5.2 Special hazards arising from the substance or mixture

- **Hazardous combustion products:** Manganese/manganese oxides. Non-combustible solid. Strong oxidizer, fire hazard when in contact with combustible materials. When heated to decomposition, may emit toxic fumes.

5.3 Advice for firefighters

- **Protective equipment:** Wear self-contained breathing apparatus for firefighting if necessary. Wear full protective clothing.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

- **Personal precautions:** Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

6.2 Environmental precautions

- **Environmental precautions:** Do not let product enter drains. Avoid discharge into the environment. Prevent further leakage or spillage if safe to do so.

6.3 Methods and material for containment and cleaning up

- **Cleaning up:** Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

- For disposal considerations, see Section 13.
- For personal protective equipment, see Section 8.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

- **Handling:** Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed. Do not eat, drink or smoke when using this product. Wash thoroughly after handling.

7.2 Conditions for safe storage, including any incompatibilities

- **Storage:** Keep container tightly closed in a dry and well-ventilated place. Store away from incompatible materials (e.g., strong reducing agents, combustible materials).

7.3 Specific end use(s)

- **Specific end use(s):** Apart from the uses mentioned in Section 1.2, no other specific uses are stipulated.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

- **Occupational Exposure Limits (OELs):**

- **OSHA PEL (Permissible Exposure Limit):** Manganese compounds (as Mn): 5 mg/m^3 (Ceiling)
- **ACGIH TLV (Threshold Limit Value):** Manganese, elemental and inorganic compounds (as Mn): 0.02 mg/m^3 (respirable fraction), 0.1 mg/m^3 (inhalable fraction)
- **NIOSH REL (Recommended Exposure Limit):** Manganese (as Mn): 1 mg/m^3 (TWA), 3 mg/m^3 (STEL)

8.2 Exposure controls

- **Appropriate engineering controls:** Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday. Use local exhaust ventilation to keep airborne concentrations below the recommended exposure limits.
- **Personal protective equipment (PPE):**
  - **Eye/face protection:** Safety glasses with side-shields conforming to EN166 or equivalent. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).
  - **Skin protection:** Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.
  - **Body Protection:** Impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
  - **Respiratory protection:** For nuisance exposures use type P95 (US) or type P1 (EU EN 143) particle respirator. For higher level protection use type OV/AG/P99 (US) or type ABEK-P2 (EU EN 143) respirator cartridges. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

- **Appearance:** Dark brown to black granules
- **Odor:** Odorless
- **Odor Threshold:** Not applicable
- **pH:** Not available (Operating pH Range: 6.5–8.5 for filtration process, not intrinsic pH of substance)
- **Melting point/freezing point:** ~535 °C (decomposes)
- **Initial boiling point and boiling range:** Not applicable (decomposes before boiling)
- **Flash point:** Not applicable (inorganic solid)
- **Evaporation rate:** Not applicable
- **Flammability (solid, gas):** Non-flammable
- **Upper/lower flammability or explosive limits:** Not applicable
- **Vapour pressure:** Not applicable
- **Vapour density:** Not applicable
- **Relative density:** 3.6–4.0 g/cm^3 (Specific Gravity)
- **Bulk Density:** 1.6–1.9 g/cm^3
- **Water solubility:** Insoluble
- **Partition coefficient: n-octanol/water:** Not applicable
- **Auto-ignition temperature:** Not applicable
- **Decomposition temperature:** ~535 °C
- **Viscosity:** Not applicable (solid)
- **Explosive properties:** Not explosive
- **Oxidizing properties:** Strong oxidizer

9.2 Other information

- **MnO_2 Content:** 75–85%

- **Particle Size:** 0.5–1.0 mm / 1–2 mm / 2–4 mm
- **Crushing Strength:** ≥95%
- **Uniformity Coefficient:** ≤1.6

SECTION 10: Stability and reactivity

10.1 Reactivity

- **Reactivity:** Strong oxidizing agent. Reacts with reducing agents.

10.2 Chemical stability

- **Chemical stability:** Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

- **Hazardous reactions:** Reacts violently with strong reducing agents, acids, and combustible materials.

10.4 Conditions to avoid

- **Conditions to avoid:** High temperatures, contact with incompatible materials.

10.5 Incompatible materials

- **Incompatible materials:** Strong reducing agents, strong acids, combustible materials, peroxides, powdered metals.

10.6 Hazardous decomposition products

- **Hazardous decomposition products:** Other decomposition products - no data available. In the event of fire: see Section 5.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

- **Acute toxicity:**
  - **Oral LD50:** > 2000 mg/kg (Rat) - Harmful if swallowed (Category 4)
  - **Inhalation LC50:** > 1.5 mg/L (Rat, 4h) - Harmful if inhaled (Category 4)
  - **Dermal LD50:** No data available
- **Skin corrosion/irritation:** May cause mild skin irritation.
- **Serious eye damage/eye irritation:** May cause mild eye irritation.
- **Respiratory or skin sensitisation:** Not expected to be a respiratory or skin sensitizer.
- **Germ cell mutagenicity:** No data available.
- **Carcinogenicity:** Not classified as a carcinogen by IARC, NTP, or OSHA.
- **Reproductive toxicity:** No data available.
- **STOT-single exposure:** No data available.
- **STOT-repeated exposure:** May cause damage to organs (Brain) through prolonged or repeated exposure if inhaled (Category 2). Chronic inhalation of manganese dust can lead to manganism, a neurological disorder.
- **Aspiration hazard:** Not considered an aspiration hazard.

SECTION 12: Ecological information

12.1 Toxicity

- **Toxicity to fish:** No data available.
- **Toxicity to daphnia and other aquatic invertebrates:** No data available.
- **Toxicity to algae:** No data available.

12.2 Persistence and degradability

- **Persistence and degradability:** Inorganic substance, not readily biodegradable.

12.3 Bioaccumulative potential

- **Bioaccumulative potential:** Manganese can accumulate in organisms, but bioaccumulation factor is generally low for inorganic manganese compounds.

12.4 Mobility in soil

- **Mobility in soil:** Low mobility in soil due to low solubility.

12.5 Results of PBT and vPvB assessment

- **PBT/vPvB assessment:** This substance does not meet the PBT/vPvB criteria of REACH, Annex XIII.

12.6 Other adverse effects

- **Other adverse effects:** No known significant adverse effects or critical hazards.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

- **Product:** Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.
- **Contaminated packaging:** Dispose of as unused product.

SECTION 14: Transport information

14.1 UN number

- **ADR/RID:** Not regulated
- **IMDG:** Not regulated
- **IATA:** Not regulated

14.2 UN proper shipping name

- **ADR/RID:** Not regulated
- **IMDG:** Not regulated
- **IATA:** Not regulated

14.3 Transport hazard class(es)

- **ADR/RID:** Not regulated
- **IMDG:** Not regulated
- **IATA:** Not regulated

14.4 Packing group

- **ADR/RID:** Not regulated
- **IMDG:** Not regulated
- **IATA:** Not regulated

14.5 Environmental hazards

- **ADR/RID:** No
- **IMDG Marine pollutant:** No
- **IATA:** No

14.6 Special precautions for user

- **Special precautions:** No data available.

14.7 Transport in bulk according to Annex II of MARPOL $^{73}/_{78}$ and the IBC Code

- **Transport in bulk:** Not applicable.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

- **USA TSCA:** All components are listed or exempted from listing on the Toxic Substances Control Act inventory.
- **EU REACH:** This product contains no substances of very high concern (SVHC) or substances subject to authorization.
- **GHS:** Classified and labeled according to the Globally Harmonized System of Classification and Labelling of Chemicals.

15.2 Chemical safety assessment

- **Chemical safety assessment:** For this product a chemical safety assessment was not carried out.

SECTION 16: Other information

16.1 Indication of changes

- **Revision Date:** 2026-02-11
- **Changes:** Initial creation of SDS.

16.2 Abbreviations and acronyms

- **ADR:** European Agreement concerning the International Carriage of Dangerous Goods by Road
- **CAS:** Chemical Abstracts Service
- **EC:** European Community
- **GHS:** Globally Harmonized System of Classification and Labelling of Chemicals
- **IATA:** International Air Transport Association

- **IBC Code:** International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk
- **IMDG:** International Maritime Dangerous Goods
- **LC50:** Lethal Concentration 50%
- **LD50:** Lethal Dose 50%
- **MARPOL:** International Convention for the Prevention of Pollution from Ships
- **MnO_2:** Manganese Dioxide
- **MSDS:** Material Safety Data Sheet
- **NIOSH:** National Institute for Occupational Safety and Health
- **OSHA:** Occupational Safety and Health Administration
- **PBT:** Persistent, Bioaccumulative and Toxic
- **PEL:** Permissible Exposure Limit
- **PPE:** Personal Protective Equipment
- **REACH:** Registration, Evaluation, Authorisation and Restriction of Chemicals
- **RID:** Regulations concerning the International Carriage of Dangerous Goods by Rail
- **STEL:** Short-Term Exposure Limit
- **STOT:** Specific Target Organ Toxicity
- **TWA:** Time Weighted Average
- **vPvB:** very Persistent and very Bioaccumulative

16.3 Key literature references and sources for data

- Information from supplier's product data sheet.
- Publicly available safety data sheets for Manganese Dioxide (CAS: 1313-13-9).
- ECHA (European Chemicals Agency) database.
- OSHA, ACGIH, NIOSH exposure limit guidelines.

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