

Safety Data Sheet (SDS)

Fine Ground MnO₂ for Anti-Corrosive Industrial Coatings

Date of Preparation: March 11, 2026

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

1.1 Product Identifier

- **Product Name:** Fine Ground MnO₂ for Anti-Corrosive Industrial Coatings
- **Chemical Name:** Manganese Dioxide (Manganese(IV) Oxide)
- **Synonyms:** Pyrolusite, Manganese Black, Battery Manganese
- **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:** Functional additive in anti-corrosive industrial coatings, pigment, oxidant, catalyst.
- **Uses Advised Against:** Not for human consumption. Avoid uses not specified above.

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)

Section 2: Hazard(s) Identification

2.1 Classification of the Substance or Mixture According to Regulation (EC) No 1272/2008 (CLP) and OSHA HCS 2012:

- Acute toxicity, Oral (Category 4) [1] [2]
- Acute toxicity, Inhalation (Category 4) [1] [2]
- Specific target organ toxicity - Repeated exposure (Category 2) (Brain) [1] [2]

2.2 GHS Label Elements, Including Precautionary Statements

- **Pictogram(s):**
 - GHS07 (Exclamation Mark) - Harmful [1] [2]
 - GHS08 (Health Hazard) - Specific target organ toxicity [1] [2]
- **Signal Word:** Warning [1] [2]
- **Hazard Statement(s):**
 - H302 + H332: Harmful if swallowed or if inhaled [1] [2]
 - H373: May cause damage to organs (Brain) through prolonged or repeated exposure [1] [2]
- **Precautionary Statement(s):**
 - **Prevention:**
 - P260: Do not breathe dust/fume/gas/mist/vapours/spray [1] [2]
 - P264: Wash skin thoroughly after handling [1] [2]
 - P270: Do not eat, drink or smoke when using this product [1] [2]
 - P271: Use only outdoors or in a well-ventilated area [1] [2]
 - **Response:**
 - P301 + P312 + P330: IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth [1] [2]

- P304 + P340 + P312: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell [1] [2]
- P314: Get medical advice/attention if you feel unwell [1] [2]
- **Disposal:**
 - P501: Dispose of contents/container to an approved waste disposal plant [1] [2]

2.3 Other Hazards Which Do Not Result in Classification

- May cause irritation to eyes, skin, and respiratory tract. Dust may cause mechanical irritation. Prolonged exposure to manganese dusts may affect the central nervous system.

Section 3: Composition/Information on Ingredients

3.1 Substances

- **Chemical Name:** Manganese Dioxide
- **Common Name/Synonyms:** Manganese(IV) Oxide, Pyrolusite
- **CAS No.:** 1313-13-9
- **EC No.:** 215-202-6
- **Concentration:** 90-95% (as MnO₂) [Product Information]
- **Impurities:** May contain trace amounts of other manganese oxides or inert materials.

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 exposure to manganese dusts may cause damage to the central nervous system (manganism), characterized by neurological symptoms such as tremors, rigidity, and psychological disturbances.

4.3 Indication of Any Immediate Medical Attention and Special Treatment Needed

- Treat symptomatically. For severe cases of inhalation or ingestion, seek immediate medical attention.

Section 5: Fire-fighting Measures

5.1 Extinguishing Media

- **Suitable Extinguishing Media:** Use water spray, alcohol-resistant foam, dry chemical, or carbon dioxide.
- **Unsuitable Extinguishing Media:** No information available.

5.2 Special Hazards Arising from the Substance or Mixture

- Non-combustible. However, ambient fire may liberate hazardous vapors/fumes. Hazardous combustion products include manganese/manganese oxides [1]. Reacts violently with combustible and reducing materials, generating fire and explosion hazards [3].

5.3 Advice for Firefighters

- Wear self-contained breathing apparatus for firefighting if necessary. Use personal protective equipment.

Section 6: Accidental Release Measures

6.1 Personal Precautions, Protective Equipment and Emergency Procedures

- Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist, or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

6.2 Environmental Precautions

- Do not let product enter drains. Do not allow to enter into soil/subsoil. Do not contaminate surface water or groundwater.

6.3 Methods and Materials for Containment and 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

- 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

- Store in a cool, dry, well-ventilated place. Keep container tightly closed. Store away from incompatible materials (e.g., strong acids, combustible materials, reducing agents) [3]. Maintain consistent powder flow and performance by storing in properly sealed containers.

7.3 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:**
 - **Manganese (as Mn), inhalable fraction:**
 - ACGIH TLV: 0.02 mg/m³ (TWA, respirable fraction); 0.1 mg/m³ (TWA, inhalable fraction) [4]
 - OSHA PEL: 5 mg/m³ (Ceiling) [4]
 - NIOSH REL: 1 mg/m³ (TWA); 3 mg/m³ (STEL) [4]

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 the workday. Use local exhaust ventilation to keep airborne concentrations below the occupational 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.
 - **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. Recommended glove materials: Nitrile rubber, Neoprene, PVC.
 - **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).
 - **Control of Environmental Exposure:** Do not let product enter drains.

Section 9: Physical and Chemical Properties

9.1 Information on Basic Physical and Chemical Properties

- **Appearance:** Black powder [Product Information]
- **Odor:** Odorless
- **Odor Threshold:** Not applicable
- **pH:** Not available (typically neutral to slightly alkaline in aqueous suspension)
- **Melting Point/Freezing Point:** ~535 °C (decomposes) [5]
- **Initial Boiling Point and Boiling Range:** Not applicable (decomposes before boiling)
- **Flash Point:** Not applicable
- **Evaporation Rate:** Not applicable
- **Flammability (solid, gas):** Non-flammable
- **Upper/Lower Flammability or Explosive Limits:** Not applicable
- **Vapor Pressure:** Not applicable
- **Vapor Density:** Not applicable
- **Relative Density:** 5.026 g/cm³ (at 25 °C) [5]
- **Bulk Density:** 0.6–0.9 g/cm³ [Product Information]
- **Water Solubility:** Insoluble in water [5]
- **Partition Coefficient: n-octanol/water:** Not applicable
- **Auto-ignition Temperature:** Not applicable
- **Decomposition Temperature:** >535 °C [5]
- **Viscosity:** Not applicable (solid)
- **Explosive Properties:** Not explosive
- **Oxidizing Properties:** Oxidizing agent, especially at high temperatures [3]
- **Particle Size (D50):** 2–8 μm [Product Information]
- **Surface Area:** 25–60 m²/g [Product Information]
- **Moisture:** ≤1.5% [Product Information]
- **Crystal Phase:** Mainly γ-MnO₂ [Product Information]

9.2 Other Information

- No additional information available.

Section 10: Stability and Reactivity

10.1 Reactivity

- Reacts violently with combustible and reducing materials [3].

10.2 Chemical Stability

- Stable under recommended storage conditions.

10.3 Possibility of Hazardous Reactions

- Reacts with aluminum on heating [3]. Strong oxidizing agent, especially at high temperatures.

10.4 Conditions to Avoid

- Heat, incompatible materials, moisture.

10.5 Incompatible Materials

- Strong acids, strong reducing agents, combustible materials, aluminum [3].

10.6 Hazardous Decomposition Products

- Hazardous decomposition products formed under fire conditions: Manganese/manganese oxides [1]. Other decomposition products: No data available.

Section 11: Toxicological Information

11.1 Information on Toxicological Effects

- **Acute Toxicity:**
 - **Oral LD50:** >2000 mg/kg (rat) [1]
 - **Inhalation LC50:** >5.06 mg/L (rat, 4h) [1]
 - **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 Sensitization:** Not classified as a 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 (manganism) [1] [2].
- **Aspiration Hazard:** Not an aspiration hazard.
- **Synergistic Effects:** No data available.
- **Additional Information:** RTECS: OO9000000

Section 12: Ecological Information

12.1 Toxicity

- **Toxicity to fish:** LC50 - *Oncorhynchus mykiss* (rainbow trout) - 2.7 mg/L - 96 h [1]
- **Toxicity to daphnia and other aquatic invertebrates:** EC50 - *Daphnia magna* (Water flea) - 13.5 mg/L - 48 h [1]
- **Toxicity to algae:** EC50 - *Pseudokirchneriella subcapitata* (green algae) - 4.5 mg/L - 72 h [1]

12.2 Persistence and Degradability

- The methods for determining biodegradability are not applicable to inorganic substances.

12.3 Bioaccumulative Potential

- Manganese is an essential trace element, but excessive exposure can lead to accumulation in tissues. Bioaccumulation factor (BCF): No data available.

12.4 Mobility in Soil

- Insoluble in water, low mobility in soil.

12.5 Results of PBT and vPvB Assessment

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

12.6 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. Dispose of in accordance with local, regional, national, and international regulations.
- **Contaminated Packaging:** Dispose of as unused product.

Section 14: Transport Information

14.1 UN Number

- Not regulated as a hazardous material for transport.

14.2 UN Proper Shipping Name

- Not applicable.

14.3 Transport Hazard Class(es)

- Not applicable.

14.4 Packing Group

- Not applicable.

14.5 Environmental Hazards

- Not a marine pollutant.

14.6 Special Precautions for User

- No special precautions required.

14.7 Transport in Bulk According to Annex II of MARPOL ⁷³/₇₈ and the IBC Code

- Not applicable.

Section 15: Regulatory Information

15.1 Safety, Health and Environmental Regulations/Legislation Specific for the Substance or Mixture

- **USA Federal Regulations:**
 - **SARA 302 Components:** No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.
 - **SARA 313 Components:** The following components are subject to reporting levels established by SARA Title III, Section 313:
 - Manganese compounds (CAS No. 1313-13-9) - Concentration: 90-95%
 - **SARA ³¹¹/₃₁₂ Hazards:** Acute Health Hazard, Chronic Health Hazard.
 - **Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List:** Manganese compounds are listed as HAPs.
 - **OSHA Process Safety Management (PSM) 29 CFR 1910.119:** Not regulated.
 - **CERCLA Reportable Quantity (RQ):** Not applicable.
- **California Proposition 65:** This product does not contain any chemicals known to the State of California to cause cancer, birth defects, or any other reproductive harm.
- **EU Regulations:**
 - **REACH Regulation (EC) No ¹⁹⁰⁷/₂₀₀₆:** This substance is registered under REACH.
 - **Candidate List of Substances of Very High Concern (SVHC):** Not listed.
 - **Authorisation List (Annex XIV of REACH):** Not listed.
 - **Restriction List (Annex XVII of REACH):** Not listed.
- **International Inventories:**
 - **TSCA (USA):** Listed.
 - **DSL/NDSL (Canada):** Listed.

- **ENCS (Japan):** Listed.
- **IECSC (China):** Listed.
- **KECL (Korea):** Listed.
- **PICCS (Philippines):** Listed.
- **AICS (Australia):** Listed.
- **NZIoC (New Zealand):** Listed.

15.2 Chemical Safety Assessment

- For this product, a chemical safety assessment has not been carried out.

Section 16: Other Information

16.1 Date of Preparation/Last Revision

- **Date of Preparation:** March 11, 2026
- **Version:** 1.0

16.2 Key to Abbreviations and Acronyms

- **CAS:** Chemical Abstracts Service
- **EC:** European Community
- **GHS:** Globally Harmonized System of Classification and Labelling of Chemicals
- **CLP:** Classification, Labelling and Packaging (Regulation)
- **LD50:** Lethal Dose, 50%
- **LC50:** Lethal Concentration, 50%
- **EC50:** Effective Concentration, 50%
- **STOT:** Specific Target Organ Toxicity
- **PBT:** Persistent, Bioaccumulative and Toxic
- **vPvB:** very Persistent and very Bioaccumulative
- **REACH:** Registration, Evaluation, Authorisation and Restriction of Chemicals
- **SARA:** Superfund Amendments and Reauthorization Act
- **TSCA:** Toxic Substances Control Act
- **ACGIH:** American Conference of Governmental Industrial Hygienists

- **OSHA:** Occupational Safety and Health Administration
- **NIOSH:** National Institute for Occupational Safety and Health
- **PEL:** Permissible Exposure Limit
- **TLV:** Threshold Limit Value
- **TWA:** Time-Weighted Average
- **STEL:** Short-Term Exposure Limit

16.3 References [1] Sigma-Aldrich. (2025, November 6). *Safety Data Sheet: Manganese(IV) oxide*. Retrieved from <https://www.sigmaaldrich.com/US/en/sds/aldrich/529664> [2] Fisher Scientific. *Safety Data Sheet: Manganese Dioxide*. Retrieved from <https://www.fishersci.com/store/msds?partNumber=S25420A> [3] International Chemical Safety Cards (ICSC). *ICSC 0175 - MANGANESE DIOXIDE*. Retrieved from https://chemicalsafety.ilo.org/dyn/icsc/showcard.display?p_lang=en&p_card_id=0175 [4] CDC. (2022, May 2). *Manganese*. Retrieved from <https://www.cdc.gov/niosh/npg/npgd0383.html> [5] PubChem. *Manganese dioxide | MnO2 / CID 14801*. Retrieved from <https://pubchem.ncbi.nlm.nih.gov/compound/Manganese-dioxide>

16.4 Disclaimer The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.