

Material Safety Data Sheet (MSDS / SDS)

Manganese Ore - All Grades (Indian 30-32% and Imported Zambian 46% Grade)

SECTION 1: Identification

Product Name	Manganese Ore, Natural Mineral (Primarily Manganese Oxides)
Synonyms	Manganese Ore, Pyrolusite, Psilomelane, Manganese Oxide Ore
CAS No.	1313-13-9 (Manganese Dioxide/MnO ₂ , principal component); natural mineral mixture
Recommended Use	Ferro-manganese and silico-manganese production; steelmaking deoxidiser/alloying raw material
Manufacturer / Supplier	Ochnology Solution Pvt. Ltd., B-153, Sector-4 Defence Colony, Dehradun, Uttarakhand, India – 248001
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SECTION 2: Hazard(s) Identification

GHS Classification: Not classified as hazardous under GHS for acute health or environmental hazards based on available data. May contain crystalline silica; nuisance dust; chronic manganese dust/fume inhalation is a recognised occupational neurotoxicity concern.

Signal Word: None (not classified) – general dust-handling precautions apply; chronic manganese exposure caution applies (see below)

Hazard Statements:

- Not classified as a hazardous substance or mixture under GHS/CLP for acute health or environmental hazards based on available data
- May contain crystalline silica (SiO₂ content typically 5–25%, grade dependent) – prolonged inhalation of respirable crystalline silica dust is associated with silicosis and is classified by IARC as Group 1 (carcinogenic to humans)
- Chronic occupational inhalation of manganese-containing dust/fume is a well-documented cause of manganese-induced neurotoxicity (“manganism”), a recognised

parkinsonism-like occupational neurological condition historically documented in miners, ferro-alloy workers and welders with sustained high exposure

Precautionary Statements:

- P260 – Do not breathe dust
- P264 – Wash hands thoroughly after handling
- P271 – Use only outdoors or in a well-ventilated area
- P280 – Wear protective gloves/eye protection
- P284 – Wear respiratory protection where dust generation is significant (e.g. crushing, dry screening, transfer)

SECTION 3: Composition / Information on Ingredients

Component	CAS No.	Concentration (w/w)
Manganese Oxides (MnO ₂ /pyrolusite/psilomelane, natural mineral)	1313-13-9	30 – 65% Mn-equivalent oxide content (grade dependent, see TDS)
Silica (SiO ₂), Alumina (Al ₂ O ₃), Iron Oxide (Fe ₂ O ₃) and other gangue minerals (natural, residual)	–	Balance (grade dependent, see TDS)

SECTION 4: First-Aid Measures**Eye Contact**

Rinse with plenty of water for several minutes to remove dust particles. Seek medical attention if irritation persists.

Skin Contact

Wash with soap and water. Generally non-irritating; seek medical attention if irritation develops.

Inhalation

Move to fresh air. If coughing or respiratory discomfort from dust persists, seek medical attention. Workers with sustained occupational exposure to manganese ore dust should be included in a medical surveillance programme given the recognised risk of chronic manganese neurotoxicity.

Ingestion

Rinse mouth with water. Not expected to be acutely harmful in small amounts; seek medical attention if a large quantity is ingested or discomfort occurs.

SECTION 5: Fire-Fighting Measures

- Non-flammable, non-combustible natural mineral; does not itself burn or support combustion
- No specific fire or explosion hazard associated with this product under normal handling
- Suitable extinguishing media: use media appropriate to the surrounding fire

SECTION 6: Accidental Release Measures

- Avoid generating dust during clean-up; use wet suppression or vacuum with HEPA filtration where practical
- Sweep or vacuum into suitable containers for reuse or disposal
- Spilled material can create a slip hazard on hard floors – clean promptly
- Wear appropriate PPE (dust mask, goggles) during clean-up of large spills

SECTION 7: Handling and Storage

- Avoid generating and inhaling dust; use wet suppression or local exhaust ventilation at dust-generating points (crushing, screening, transfer)
- Where this product is dry-processed, crushed or ground by the buyer, follow applicable respirable crystalline silica exposure regulations given the SiO₂ content of this product
- Facilities with sustained manganese ore dust exposure should implement a manganese exposure monitoring/medical surveillance programme consistent with occupational health best practice
- Store in a covered or designated open stockyard away from contamination

SECTION 8: Exposure Controls / Personal Protection

Occupational Exposure Limits

OSHA PEL for manganese compounds (as Mn): 5 mg/m³ ceiling (fume), 5 mg/m³ (dust); ACGIH TLV: 0.02 mg/m³ (respirable), 0.1 mg/m³ (inhalable), 8-hr TWA – note the ACGIH TLV has been significantly tightened over the years specifically in response to accumulating neurotoxicity evidence; confirm current jurisdiction-specific limit. If respirable crystalline silica is

Engineering Controls	confirmed present, the applicable silica PEL takes precedence Wet suppression and/or local exhaust ventilation at all dust-generating process steps, particularly crushing and screening
Eye/Face Protection	Safety glasses or goggles recommended in dusty conditions
Hand Protection	General-purpose work gloves sufficient for routine handling
Respiratory Protection	Dust mask (N95 or equivalent) recommended in dusty conditions; higher-grade respiratory protection (e.g. P100) recommended for dry crushing/grinding operations given the combined crystalline silica and manganese neurotoxicity considerations

SECTION 9: Physical and Chemical Properties

Property	Unit	Value
Appearance	–	Black to dark grey/brown lumps, fines or powder (colour varies with Mn/Fe content and origin)
Odour	–	Odourless
Density	g/cm ³	≈ 3.7 – 4.7 (grade/mineralogy dependent)
Solubility in Water	–	Insoluble
Flash Point	–	Not applicable (non-combustible inorganic solid)

SECTION 10: Stability and Reactivity

- Stable under normal conditions of storage, handling and use
- Chemically inert under ambient conditions; manganese dioxide (MnO₂) component can act as a mild oxidiser at the pure-compound level, but natural ore – being a mixed mineral matrix with substantial silicate/iron content – is not classified as an oxidising solid in standard trade handling
- Incompatible materials: strong reducing agents, strong acids (can generate heat/reaction with concentrated acids)

SECTION 11: Toxicological Information

- Low acute oral and dermal toxicity based on published data for manganese oxide minerals
- Chronic occupational inhalation of manganese-containing dust or fume is a well-established cause of manganese neurotoxicity (“manganism”) – a recognised, parkinsonism-like neurological condition documented in manganese miners, ferro-alloy workers and welders with sustained high exposure over years. This is a genuine, well-characterised occupational health concern distinct from typical inert mineral dust exposure, and is the basis for the specific, relatively low ACGIH/OSHA manganese exposure limits noted in Section 8
- May contain crystalline silica (see Section 2); relevant primarily where the buyer dry-crushes, grinds, or otherwise generates significant respirable dust from this material
- Not classified as carcinogenic or mutagenic based on available information for manganese ore itself

SECTION 12: Ecological Information

- Not classified as hazardous to aquatic organisms under GHS criteria based on available data; manganese oxide minerals are largely insoluble and chemically stable
- May increase turbidity/sedimentation if released to waterways in bulk
- No significant bioaccumulation potential expected for the mineral form

SECTION 13: Disposal Considerations

- Dispose of product in accordance with local, state and national regulations
- Not classified as hazardous waste under standard criteria
- Recoverable material – typically reused/recycled given its value as a manganese unit source

SECTION 14: Transport Information

UN Number

Not applicable – not classified as Dangerous Goods for chemical

	hazard purposes
IMSBC Code Classification	Confirm current classification with carrier/freight forwarder – manganese ore fines with elevated moisture content may be subject to IMSBC Group A (liquefaction) assessment depending on moisture level and particle size distribution, similar to iron ore fines
Proper Shipping Name	Manganese Ore (bulk solid cargo)
Packing Group	Not applicable (bulk cargo)
Environmental Hazards	None identified under standard transport classification criteria

SECTION 15: Regulatory Information

- Manganese oxide is widely listed on major chemical inventories (TSCA, REACH, ECL, etc.) as an existing/registered substance
- Given the recognised occupational neurotoxicity profile of manganese dust/fume, several jurisdictions maintain specific, relatively conservative manganese exposure limits (see Section 8) – buyers with processing/handling facilities should confirm current limits and implement appropriate monitoring
- Maritime transport: as with iron ore fines, manganese ore fines shipped with elevated moisture content may be subject to IMSBC Group A cargo liquefaction assessment – confirm current classification and, where applicable, verify moisture content against the Transportable Moisture Limit (TML) before loading
- This SDS covers both grades referenced in the accompanying TDS documents (Indian 30-32% and imported Zambian ~46% grade) – the hazard profile does not materially change between these grades, only the Mn/Fe/SiO₂ ratios and corresponding trace impurity levels differ

SECTION 16: Other Information

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This SDS has been compiled based on general industry data and knowledge for Manganese Ore products of this type as commercially supplied, covering Indian 30-32% grade and imported Zambian ~46% grade. It is intended as a general handling and safety guide and does not replace a shipment-specific SDS, moisture/TML testing certificate (where applicable), or a professional occupational health and IMSBC Code compliance review, particularly regarding manganese exposure monitoring at any processing/handling facility.

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