



Iron Oxide 1 S (Green Sand) SAFETY DATA SHEET

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1. General Information

Use of the Substance/Preparation:
Chemical Name:

Removal of Heavy metals and Sulfur Compounds from Water
Granular Manganese Dioxide

Health	2
Flammability	0
Reactivity	1

0-minimal; 1-slight; 2-moderate; 3-serious; 4-severe

2. Composition

Ingredient	Concentration	CAS #
Manganese Dioxide (MnO ₂)	3.2-4.8%	1313-13-9
Quartz (SiO ₂)	96-98%	14808-60-7

3. Hazard Identification

Component	CAS#	%	OSHA PEL (mg/m ²)	OSHA ceiling (mg/m ²)	ACGIH TLV (mg/m ²)	ACGIH STEL (mg/m ²)	Listed Carcinogen (Yes/No)		
MnO ₂	1313-13-9	3.2-4.8	N/A	5F (as Mn)	0.2 (as Mn)	N/A	No	No	No
Quartz (SiO ₂)	14808-60-7	96-98	10/(% SiO ₂ +2)	N/A	10T; 5R	N/A	No	No	No

1. Exposure limits listed for each ingredient, is for exposure to dust that may be generated during product transfer and handling.
2. Solid Manganese Dioxide (MnO₂)-0.30-0.35 mm is formulated for use in water purification. Health effects resulting from the product being used for any other purpose or process is not addressed in this MSDS.
3. NTP Class 2A: Reasonably anticipated to be a carcinogen, limited evidence of carcinogenicity from studies in humans.
4. IARC Group 2A: Probably carcinogenic to humans.

4. Emergency Overview

Not a fire or spill hazard. Low toxicity, dry dust is a nuisance particulate. Generally, health effects are provided for exposure to dust that may be generated during product transfer and handling.

5. Potential Health Effects

Primary Route of Exposure:

Inhalation

Eye Contact:

Contact with particulate may cause slight to moderate eye irritation. Abrasive action of dust particulate can damage eye.

Skin Contact:

Prolonged or repeated contact may cause slight to moderate skin irritation.

Inhalation:

Overexposure by inhalation of airborne particulate, dust or fumes is irritating to the nose, throat, and respiratory tract. Inhalation of excessive levels of dust or fumes may be harmful.

Ingestion:

Ingestion is an unlikely route of exposure; no hazard in normal industrial use. Small amounts (<tablespoon) swallowed during normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury. If ingested quantity, may cause gastrointestinal disturbances. Symptoms may include irritation, nausea, vomiting, abdominal pain, and diarrhea.

Target Organs:

Respiratory system, eyes, central nervous system.

Acute Effects of Exposure:

Excessive, short-term exposure to airborne mineral dusts and particulate may cause upper respiratory and eye irritation. Exposure via inhalation to high concentration of dusts containing manganese compounds for as little as three months have affected the central nervous system.

Chronic Effects of Exposure:

Excessive, long-term, inhalation of airborne mineral dusts and particulate may contribute to the development of bronchitis, reduced breathing capacity and may lead to the increased susceptibility to lung disease.

Manganese poisoning:

The excessive, chronic inhalation of manganese compounds usually begins with complaints of languor and sleepiness. This is followed by weakness in the legs and the development of stolid, mask-like faces. The patient speaks with a slow monotonous voice. Then muscular twitching appears, varying from a fine tremor of the hands to coarse, rhythmical movements of the arms, legs and trunk. There is a slight increase in tendon reflexes, ankle and patellar clonus and a typical Parkinsonian slapping gate.

Signs and Symptoms of Exposure:

(Dust) tearing of eyes, burning sensation in the throat, cough, and chest discomfort.

Medical Conditions Aggravated:

The excessive inhalation of mineral dust may aggravate pre-existing chronic lung conditions such as, but not limited to, bronchitis, emphysema and asthma.

6. Environmental Effects

Derived from natural ores; no adverse environment effects known. However, prevent spilled product from entering streams, water bodies, and waste water systems. This material is used as an agricultural product.

7. First Aid Measures

Eye Contact:

Remove material by immediately flushing eyes with clean, flowing, lukewarm water (low pressure) for at least 15 minutes. Get medical attention if pain or irritation persists.

Skin Contact:

Immediately wash affected area with mild soap and water to remove any dust adhering to the skin. Get medical attention if irritation develops or persists.

Inhalation:

If exposed to excessive levels of dusts or fumes, remove to fresh air and get medical attention if cough or other symptoms develop. If not breathing, give artificial respiration or give oxygen by trained personnel, and get medical attention.

Ingestion:

Ingestion is an unlikely route of exposure. If ingested in sufficient quantity and victim is conscious, give 1-2 glasses of water or milk. Never give anything by mouth to an unconscious person. Leave decision to induce vomiting to qualified medical personnel, since particles may be aspirated into the lungs.

8. Fire-Fighting Measures

Flammable Properties:

Material will not burn. Although not combustible, this material is a strong oxidizing agent, which liberates oxygen during thermal decomposition. It may increase the burning rate of combustibles with a flare-burning effect. It may cause re-ignition after a fire is extinguished.

Extinguishing Media:

Use dry chemical or CO₂ to extinguish fires involving this material.

Protection for Firefighters:

Material should be kept out of eyes and skin. As in any fire, wear self-contained breathing apparatus pressure-demand. MSHA/NIOSH (approved or equivalent) and full protective gear. Do not release runoff from fire control methods to sewers or waterways.

9. Accidental release Measures

Containment:

Product is a dry solid (granular or powder) and not readily soluble in water. However, prevent spilled product from entering streams, water bodies, and waste water systems.

Clean-up:

Vacuum or sweep up dry material and place in a container for reuse. Avoid creating excessive airborne dust. Clean-up personnel need to wear approved respiratory protection (air-purifying or air-supply), gloves, long sleeved clothing and goggles to prevent irritation from contact and inhalation.

Collection:

If possible, collect and reuse spilled product.

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10. Handling and Storage

Handling:

Minimize dust generation and accumulation. Avoid breathing dust. Avoid contact with skin and eyes.

Storage:

Store product in a cool, dry area. Keep container closed when not in use. Product or component is a powerful oxidizer; hence it should not be stored near organic matter or other easily oxidizable substances, i.e., sulfur, sulfides, phosphides, hypophosphides, etc. or incompatible materials such as hydrogen peroxide and sodium peroxide.

11. Personal Protection

Engineering Controls:

If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limits.

Personal Protective Equipment

Eye and Face:

Corrosive to eyes. Wear protective safety goggles when dust generation is likely.

Skin Protection:

Wear clothing sufficient to cover the skin, safety shoes, and leather gloves for hand protection against dry material.

Respiratory Protection:

Use NIOSH/MSHA approved respiratory protection (air-purifying or air-supplying) when concentrations are above exposure limit value. A respiratory protection program that meets OSHA 29 CFR part 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant the use of a respirator.

General Hygiene:

Wash thoroughly after using product. Wash contaminated clothing. Wash hands before eating, drinking or use of tobacco products.

12. Physical and Chemical Properties

Appearance:	Uniform brownish-black granule
Odor:	Odorless
Bulk Density:	1.4 g/ml
Freeze Point:	Solid at STP
% Volatile by Volume:	1 - 2% H ₂ O
Water Solubility:	Slight
Melting Point:	>2800° F (1538° C)
Vapor Density:	N/A
pH (10% aqueous slurry):	6.4 – 7.0
Boiling Point:	N/A
Vapor Pressure:	N/A

13. Stability and Reactivity

Stability:

Stable under normal conditions of storage

Conditions to Avoid:

None under normal conditions.

Materials to Avoid:

Manganese Dioxide (MnO₂) is a powerful oxidizer, hence it should not be heated or rubbed with organic matter or other easily oxidized substances. Material is flammable by chemical reaction. Incompatible with hydrogen peroxide and sodium peroxide. Keep away from heat and flammable materials.

14. Toxicological Properties

Component	CAS#	RTECS Toxicity Data
Manganese dioxide (MnO ₂)	1313-13-9	Acute Dermal: Mouse LD 50, Route: Subcutaneous, Dose: 422 mg/kg Chronic (Multiple Dose) Inhalation: Rate Dose: 1800 ug/m ³ /24H/35D-C; Toxic Effects: Brain and coverings – Recordings from specific areas of CNS; Blood – Charges in serum composition; Biochemical – True cholinesterase. Reproductive: Mouse Route: Inhalation; Dose: 49 mg/m ³ /7H; Duration: female 75D prior to mating Effects on newborn – Growth statistics; behavioral
Quartz (SiO ₂)	14808-60-7	Acute Inhalation: Human LC Low Dose: 300 ug/m ³ /10Y-1; Toxic Effects: Liver – Other changes; Human TC Low Dose: 16 mppcf/*H/17,9Y-1; Toxic Effects: Lungs, Thorax of respiration – Fibrosis, focal (pneumoconiosis); Lungs, Thorax of respiration – Cough; Lungs, Thorax of Respiration Dyspnea Chronic) Multiple Dose) Inhalation: Rat Dose 80 mg/m ³ /28W-1; Toxic Effects: Lungs, Thorax or Respiration – Fibrosis, focal

15. Ecological Information

Derived from mineral ores. No data on any adverse effects of this material on the environment

16. Disposal Considerations

RCRA:

This product as manufactured, is not an RCRA, listed hazardous waste and does not exhibit any characteristics of a hazardous waste, including toxicity (by EPA TCLP method).

Disposal Method:

This product is generally suitable for landfill disposal. Follow all applicable Federal, State and local laws, rules and regulations regarding the proper disposal of this material. If this product has been altered or contaminated with other hazardous materials, appropriate waste analysis may be necessary to determine proper method for disposal. A qualified environmental professional should determine waste characterization, disposal, and treatment methods for this material in accordance with applicable Federal, State and local regulations.

17. Transportation Information

USDOT:

This product is not regulated by USDOT as a hazardous material (49 CFR part 172.101). No UN code assigned. No placard required for transportation

18. Regulatory Information

Components Listed in Federal Regulations and State "Right-To-Know" Laws

Component	CAS#	RCRA	CERCLA	SARA	SARA EHS	TSCA	PA	NJ	MA	CA
MnO ₂	1313-13-9	No	Yes ¹	Yes (as a Compound)	No	Yes	No	No	No	No
SiO ₂	14808-80-7	No	No	No	No	Yes	Yes	No	Yes	No

1. Listed as Compound per CAA Section 112.
2. Listed per CWA Section 307(a) RQ: 10 lb (4.535 kg).
3. Listed as compound.

The information provided in this MSDS is based on current knowledge about the product as well as current legal requirements and standards. It relates specifically to health, safety and environmental requirements and standards, may not identify all hazards associated with the product or its uses. It does not signify any warranty with regard to the properties of the product and only applies when the product is used for the purposes indicated. This product is not sold as suitable for any other purposes and such other usage or misuse of the product may cause risks not mentioned in this MSDS.