

# Material Safety Data Sheet

## Manganese(IV) dioxide

ACC# 13610

### Section 1 - Chemical Product and Company Identification

**MSDS Name:** Manganese(IV) dioxide**Catalog Numbers:** AC193470000, AC193470050, AC203190000, AC203190030, AC203190050, AC203191000, AC203195000, AC213490000, AC213490010, AC213490250, AC222580000, AC222580050, AC222580500, AC222581000, AC222585000, AC357790000, AC357790050, AC357790500, S75734, S75737, S93297, S93298, M108-500, NC9348319, NC9353110**Synonyms:** Black manganese oxide; Manganese dioxide; Manganese(IV) oxide; Manganese peroxide; Manganese binoxide; Manganese black; Battery manganese; Manganese superoxide; occurs in nature as the mineral pyrolusite.**Company Identification:**Fisher Scientific  
1 Reagent Lane  
Fair Lawn, NJ 07410**For information, call:** 201-796-7100**Emergency Number:** 201-796-7100**For CHEMTREC assistance, call:** 800-424-9300**For International CHEMTREC assistance, call:** 703-527-3887

### Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1313-13-9	Manganese dioxide	>80	215-202-6

### Section 3 - Hazards Identification

#### EMERGENCY OVERVIEW

Appearance: black crystalline powder.

**Danger!** Strong oxidizer. Contact with other material may cause a fire. Harmful if inhaled or swallowed. May cause eye, skin, and respiratory tract irritation. May cause central nervous system effects. Inhalation of fumes may cause metal-fume fever. May cause adverse reproductive effects based upon animal studies.**Target Organs:** Central nervous system, lungs, reproductive system.**Potential Health Effects****Eye:** May cause eye irritation.**Skin:** May cause skin irritation.**Ingestion:** Harmful if swallowed. May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Ingestion of large amounts may cause CNS depression. In high doses, manganese may increase anemia

by interfering with iron absorption. Although they are poorly absorbed through the intestine, inorganic manganese salts may produce hypoglycemia and decreased calcium blood levels should absorption occur.

**Inhalation:** May cause respiratory tract irritation. Harmful if inhaled. Aspiration may cause severe pneumonia. The lowest exposure concentration of manganese at which early effects on the CNS and the lungs may occur is still unknown. However, once neurological signs are present, they tend to continue and worsen after exposure ends.

**Chronic:** Chronic inhalation or ingestion may result in manganism characterized by neurological symptoms such as headache, apathy, and weakness of the legs, followed by psychosis and neurological symptoms similar to those of Parkinson's disease. Adverse reproductive effects have been reported in animals. Other chronic effects from inhaling high amounts of manganese include an increased incidence of cough and bronchitis and susceptibility to infectious lung disease.

## Section 4 - First Aid Measures

**Eyes:** Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

**Skin:** Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

**Ingestion:** Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

**Inhalation:** Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

**Notes to Physician:** Treat symptomatically and supportively.

## Section 5 - Fire Fighting Measures

**General Information:** As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. Substance is noncombustible.

**Extinguishing Media:** Use extinguishing media most appropriate for the surrounding fire.

**Flash Point:** Not applicable.

**Autoignition Temperature:** Not available.

**Explosion Limits, Lower:** Not available.

**Upper:** Not available.

**NFPA Rating:** (estimated) Health: 2; Flammability: 0; Instability: 0; Special Hazard: OX

## Section 6 - Accidental Release Measures

**General Information:** Use proper personal protective equipment as indicated in Section 8.

**Spills/Leaks:** Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation. Keep combustibles (wood, paper, oil, etc.,) away from spilled material.

## Section 7 - Handling and Storage

**Handling:** Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Do not breathe dust, mist, or vapor. Keep container tightly closed. Do not ingest or inhale. Keep from contact with clothing and other combustible materials. Inform laundry personnel of contaminant's hazards.

**Storage:** Do not store near combustible materials. Store in a cool, dry place. Store in a tightly closed container. Keep away from reducing agents.

## Section 8 - Exposure Controls, Personal Protection

**Engineering Controls:** Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

### Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Manganese dioxide	0.2 mg/m <sup>3</sup> TWA (as Mn) (listed under Manganese, inorganic compounds).	1 mg/m <sup>3</sup> TWA (as Mn) (listed under Manganese compounds, n.o.s.).500 mg/m <sup>3</sup> IDLH (as Mn) (listed under Manganese compounds, n.o.s.).	5 mg/m <sup>3</sup> Ceiling (as Mn) (listed under Manganese compounds, n.o.s.).

**OSHA Vacated PELs:** Manganese dioxide: No OSHA Vacated PELs are listed for this chemical.

### Personal Protective Equipment

**Eyes:** Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

**Skin:** Wear appropriate protective gloves to prevent skin exposure.

**Clothing:** Wear appropriate protective clothing to prevent skin exposure.

**Respirators:** Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

## Section 9 - Physical and Chemical Properties

**Physical State:** Crystalline powder

**Appearance:** black

**Odor:** odorless

**pH:** 6.2 (1500 g/L aq.sol.)

**Vapor Pressure:** Not applicable.

**Vapor Density:** Not available.

**Evaporation Rate:**Not applicable.

**Viscosity:** Not applicable.

**Boiling Point:** Not applicable.

**Freezing/Melting Point:**535 deg C

**Decomposition Temperature:**535 deg C

**Solubility:** Insoluble.  
**Specific Gravity/Density:**5.02  
**Molecular Formula:**MnO2  
**Molecular Weight:**86.94

## Section 10 - Stability and Reactivity

**Chemical Stability:** Stable under normal temperatures and pressures.

**Conditions to Avoid:** Dust generation, excess heat.

**Incompatibilities with Other Materials:** Organic matter, azides, hydrogen peroxide, sulfur, sulfides, phosphides, hypophosphites, strong reducing agents, combustible materials, aldehydes, alcohols, acids (mineral, non-oxidizing, e.g. hydrochloric acid, hydrofluoric acid, muriatic acid, phosphoric acid), acids (organic, e.g. acetic acid, benzoic acid, formic acid, methanoic acid, oxalic acid).

**Hazardous Decomposition Products:** Oxygen, oxides of manganese.

**Hazardous Polymerization:** Has not been reported.

## Section 11 - Toxicological Information

**RTECS#:**

**CAS#** 1313-13-9: OP0350000

**LD50/LC50:**

CAS# 1313-13-9:

Oral, rat: LD50 = >3478 mg/kg;

**Carcinogenicity:**

CAS# 1313-13-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

**Epidemiology:** The U.S. EPA stated that epidemiological studies of inorganic manganese compounds in humans indicate effects on the respiratory system at levels below 1 mg/m<sup>3</sup>.

**Teratogenicity:** No information available.

**Reproductive Effects:** Men exposed to manganese dusts showed a decrease in fertility.

**Mutagenicity:** No information found

**Neurotoxicity:** Manganese is neurotoxic.

**Other Studies:**

## Section 12 - Ecological Information

**Ecotoxicity:** No data available. No information available.

**Environmental:** No information available.

**Physical:** No information available.

**Other:** Do not empty into drains.

## Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

**RCRA P-Series:** None listed.

**RCRA U-Series:** None listed.

## Section 14 - Transport Information

	US DOT	Canada TDG
<b>Shipping Name:</b>	OXIDIZING SOLID, N.O.S.	OXIDIZING SOLID NOS (MANGANESE DIOXIDE)
<b>Hazard Class:</b>	5.1	5.1
<b>UN Number:</b>	UN1479	UN1479
<b>Packing Group:</b>	II	II

## Section 15 - Regulatory Information

### US FEDERAL

#### TSCA

CAS# 1313-13-9 is listed on the TSCA inventory.

#### Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

#### Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

#### Section 12b

None of the chemicals are listed under TSCA Section 12b.

#### TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

#### CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

#### SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

#### SARA Codes

CAS # 1313-13-9: delayed, fire.

#### Section 313

This material contains Manganese dioxide (listed as Manganese compounds, n.o.s.), >80%, (CAS# 1313-13-9) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

#### Clean Air Act:

CAS# 1313-13-9 (listed as Manganese compounds, n.o.s.) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

#### Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

**OSHA:**

None of the chemicals in this product are considered highly hazardous by OSHA.

**STATE**

CAS# 1313-13-9 can be found on the following state right to know lists: California, (listed as Manganese compounds, n.o.s.), New Jersey, Pennsylvania, (listed as Manganese compounds, n.o.s.), Minnesota, (listed as Manganese compounds, n.o.s.).

**California Prop 65**

California No Significant Risk Level: None of the chemicals in this product are listed.

**European/International Regulations****European Labeling in Accordance with EC Directives****Hazard Symbols:**

XN

**Risk Phrases:**

R 20/22 Harmful by inhalation and if swallowed.

**Safety Phrases:**

S 25 Avoid contact with eyes.

**WGK (Water Danger/Protection)**

CAS# 1313-13-9: 1

**Canada - DSL/NDSL**

CAS# 1313-13-9 is listed on Canada's DSL List.

**Canada - WHMIS**

This product has a WHMIS classification of C, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

**Canadian Ingredient Disclosure List**

CAS# 1313-13-9 (listed as Manganese compounds, n.o.s.) is listed on the Canadian Ingredient Disclosure List.

<b>Section 16 - Additional Information</b>
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**MSDS Creation Date:** 5/14/1998

**Revision #5 Date:** 6/08/2007

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