Material Safety Data Sheet
Manganese(IV) dioxide

MSDS# 13610

Section 1 - Chemical Product and Company Identification

MSDS Name:	Manganese(IV) dioxide
Catalog Numbers:	AC222585000, AC357790000, AC357790050, AC357790500, M108-500
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 One Reagent Lane Fair Lawn, NJ 07410
For information in the US, call:	201-796-7100
Emergency Number US:	201-796-7100
CHEMTREC Phone Number, US:	800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#:	1313-13-9
Chemical Name:	Manganese dioxide
%:	>80
EINECS#:	215-202-6

Hazard Symbols: XN

Risk Phrases: 20/22

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Danger! Strong oxidizer. Contact with other material may cause a fire. May cause central nervous system effects. May cause adverse reproductive effects based upon animal studies. Inhalation of fumes may cause metal-fume fever. Harmful if inhaled or swallowed. May cause eye, skin, and respiratory tract irritation. 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 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

Chronic: 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:

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.

Autoignition Temperature: Not available.

Flash Point: Not applicable.

Explosion Limits: Lower: Not available

Explosion Limits: Upper: Not available

NFPA Rating: ; instability: 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

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Manganese dioxide	0.2 mg/m3 TWA (as Mn) (listed under Manganese, inorganic compounds).	1 mg/m3 TWA (as Mn) (listed under Manganese compounds, n.o.s.).500 mg/m3 IDLH (as Mn) (listed under Manganese compounds, n.o.s.).	5 mg/m3 Ceiling (as Mn) (listed under Manganese compounds, n.o.s.).

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OSHA Vacated PELs: Manganese dioxide: None listed

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

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
Color:	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 (995.00°F)
Decomposition Temperature:	
Solubility in water:	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	Strong reducing agents, alcohols, sulfur, hydrogen peroxide, 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), hypophosphites, organic matter, azides, aldehydes, combustible materials, sulfides, phosphides.
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:	RTECS: **CAS# 1313-13-9:** Oral, rat: LD50 = >3478 mg/kg; .
Carcinogenicity:	Manganese dioxide - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.
Other:	See actual entry in RTECS for complete information.

Section 12 - Ecological Information

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Dispose of in a manner consistent with federal, state, and local regulations.

Section 14 - Transport Information

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

Section 15 - Regulatory Information

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

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

Canadian WHMIS Classifications: C, D2A

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.

CAS# 1313-13-9 is not listed on Canada's Ingredient Disclosure List.

US Federal

TSCA

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

Section 16 - Other Information

MSDS Creation Date: 5/14/1998

Revision #6 Date 7/20/2009
