

Section 4. First Aid Measures

Eye Contact	Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.
Skin Contact	In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.
Serious Skin Contact	Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.
Inhalation	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
Serious Inhalation	Not available.
Ingestion	Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.
Serious Ingestion	Not available.

Section 5. Fire and Explosion Data

Flammability of the Product	Non-flammable.
Auto-Ignition Temperature	Not applicable.
Flash Points	Not applicable.
Flammable Limits	Not applicable.
Products of Combustion	Not available.
Fire Hazards in Presence of Various Substances	Not applicable.
Explosion Hazards in Presence of Various Substances	Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.
Fire Fighting Media and Instructions	Not applicable.
Special Remarks on Fire Hazards	Contact with combustible or organic materials may cause fire.
Special Remarks on Explosion Hazards	Not available.

Section 6. Accidental Release Measures

Small Spill	Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.
Large Spill	Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7. Handling and Storage

Precautions	Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as reducing agents, combustible materials, organic materials, acids.
Storage	Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
Personal Protection	Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection in Case of a Large Spill	Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.
Exposure Limits	CEIL: 5 (mg/m ³) from OSHA (PEL) [United States] Inhalation TWA: 0.2 (mg/m ³) from ACGIH (TLV) [United States] Inhalation Consult local authorities for acceptable exposure limits.

Section 9. Physical and Chemical Properties

Physical state and appearance	Solid.	Odor	Odorless.
Molecular Weight	86.94 g/mole	Taste	Not available.
pH (1% soln/water)	Not applicable.	Color	Black to Brownish-Black
Boiling Point	Not available.		
Melting Point	535°C (995°F)		
Critical Temperature	Not available.		
Specific Gravity	5.026 (Water = 1)		
Vapor Pressure	Not applicable.		
Vapor Density	Not available.		
Volatility	Not available.		
Odor Threshold	Not available.		
Water/Oil Dist. Coeff.	Not available.		
Ionicity (in Water)	Not available.		
Dispersion Properties	Not available.		
Solubility	Insoluble in cold water, hot water.		

Section 10. Stability and Reactivity Data

Stability	The product is stable.
Instability Temperature	Not available.
Conditions of Instability	Not available.
Incompatibility with various substances	Reactive with reducing agents, combustible materials, organic materials, acids.
Corrosivity	Non-corrosive in presence of glass.
Special Remarks on Reactivity	Incompatible with easily oxidizable materials, sulfur, sulfides, phosphids, hypophosphites, chlorates, peroxides, aluminum powder, rubidium acetylide, potassium azide, chlorine trifluoride. Reacts with hydrochloric acid to form corrosive chlorine gas. Heating or rubbing with material with organic materials can cause fire hazard.
Special Remarks on Corrosivity	Not available.
Polymerization	Will not occur.

Section 11. Toxicological Information

Routes of Entry	Inhalation. Ingestion.
Toxicity to Animals	Acute oral toxicity (LD50): >3478 mg/kg [Rat].
Chronic Effects on Humans	May cause damage to the following organs: blood, the nervous system, liver, central nervous system (CNS).
Other Toxic Effects on Humans	Hazardous in case of skin contact (irritant), of ingestion, of inhalation.
Special Remarks on Toxicity to Animals	Not available.
Special Remarks on Chronic Effects on Humans	May cause adverse reproductive effects. Decrease of sperm count in human.
Special Remarks on other Toxic Effects on Humans	<p>Acute Potential Health Effects:</p> <p>Skin: Causes skin irritation.</p> <p>Eyes: Causes eye irritation from mechanical action.</p> <p>Inhalation: Inhalation manganese dioxide fume can cause "fume metal fever", a flu-like illness characterized by chills, fever, aching muscles, dryness in the mouth and throat, headache. It may irritate the respiratory tract. It may increase the incidence of upper respiratory tract and pulmonary infections. It may also cause emphysema, and acute pulmonary edema. Absorption of inorganic manganese salts through the lungs is poor, but may occur in chronic poisoning.</p> <p>Ingestion: May cause abdominal pain and nausea. Although manganese salts are poorly absorbed through the intestines, they may produce hypoglycemia, and decreased blood calcium levels could absorption occur.</p> <p>Chronic Potential Health Effects:</p> <p>Chronic exposure to Manganese dioxide can lead to manganese poisoning, called Manganism. It primarily involves the central nervous system. Early symptoms include languor, sleepiness, poor appetite, and weakness in the legs. Later effects which may include a stolid mask-like appearance of the face, muscle cramps, twitching and tremors, changes in mood and personality, emotional disturbances such as uncontrollable laughter and a spastic gait with tendency to fall while walking as well as anemia are also findings in workers exposed to the dust or fumes of manganese compounds. Later symptoms are identical to Parkinson's disease. Repeated or prolonged exposure may also damage the liver and may cause a decrease in the heart rate.</p> <p>Repeated inhalation of manganese dust may also cause Manganese Pneumonitis, bronchitis with cough, phlegm, and/or shortness breath.</p>

Section 12. Ecological Information

Ecotoxicity	Not available.
BOD5 and COD	Not available.
Products of Biodegradation	Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.
Toxicity of the Products of Biodegradation	The products of degradation are less toxic than the product itself.
Special Remarks on the Products of Biodegradation	Not available.


Section 13. Disposal Considerations

Waste Disposal	Waste must be disposed of in accordance with federal, state and local environmental control regulations.
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Section 14. Transport Information

DOT Classification	CLASS 5 OXIDIZER
Identification	OXIDIZING SOLID, N.O.S., CLASS 5.1, UN1479, PG II
Special Provisions for Transport	Manganese Dioxide was tested per IATA Oxidizer test, method 3.5.1.2.1 to determine if it should be classified as an oxidizer. This material does not meet the definition of an oxidizer according to IATA Oxidizer test, method 3.5.1.2.1

Section 15. Other Regulatory Information and Pictograms

Federal and State Regulations	Pennsylvania RTK: Manganese dioxide New Jersey: Manganese dioxide TSCA 8(b) inventory: Manganese dioxide SARA 313 toxic chemical notification and release reporting: Manganese dioxide							
California Proposition 65 Warnings	California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: No products were found. California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: No products were found.							
Other Regulations	OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.							
Other Classifications	WHMIS (Canada)	CLASS D-2B: Material causing other toxic effects (TOXIC). Manganese Dioxide was tested per IATA Oxidizer test, method 3.5.1.2.1 to determine if it should be classified as an oxidizer. This material does not meet the definition of an oxidizer according to IATA Oxidizer test, method 3.5.1.2.1						
	DSCL (EEC)	R20/22- Harmful by inhalation and if swallowed. S25- Avoid contact with eyes.						
HMIS (U.S.A.)	<table border="1"> <tr> <td>Health</td> <td>2</td> </tr> <tr> <td>Flammability</td> <td>0</td> </tr> <tr> <td>Reactivity</td> <td>0</td> </tr> </table>	Health	2	Flammability	0	Reactivity	0	National Fire Protection Association (U.S.A.) 
Health	2							
Flammability	0							
Reactivity	0							

Personal Protection

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Specific hazard

**WHMIS (Canada)
(Pictograms)**



**DSCL (Europe)
(Pictograms)**



Protective Equipment



Gloves.



Lab coat.



Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.



Splash goggles.

Section 16. Other Information

References Not available.

Other Special Considerations Not available.

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Notice to Reader

All chemicals may pose unknown hazards and should be used with caution. This Material Safety Data Sheet (MSDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this MSDS is based on technical data judged to be reliable, ProChem Chemicals Inc. assumes no responsibility for the completeness or accuracy of the information contained herein.