



MATERIAL SAFETY DATA SHEET Manganomanganic Oxide

1.	IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND OF THE COMPANY				
1.1	Identification of the substance or preparation :				
1.1.1	Product Name : Manganomanganic Oxide, MM12.				
1.1.2	Chemical Name : Manganese Oxide, Mn ₃ O ₄ .				
1.2	Manufacturer : MANGANESE METAL COMPANY (PTY) LTD P O Box 323 NELSPRUIT. 1200 REPUBLIC OF SOUTH AFRICA Phone : (27) 013 7594600				
1.3	Emergency Telephone No. : (27) 013 7594600				
2.	COMPOSITION / INFORMATION ON INGREDIENTS :				
2.1	Components :	CAS No.	Weight %	Danger symbol	R and S-phrases
	Manganese Oxide	7439-96-5	71.1 - 71.9	Xn: Harmful	R : 20, 22, 48. S : 20, 22, 26.

THE FIRST CHOICE IN PURE MANGANESE

Directors: P D Beaven (Chairman), L J Arthur (Managing Director),
 P C Hechter, C Jacobs, B M Katomba, B R Wright, T G Atkinson (USA)



3.	HAZARDS IDENTIFICATION
3.1	Inhalation : May cause irritation to the respiratory organs.
3.2	Ingestion : Swallowing or absorption through the skin can cause acute or chronic damage to health. All contact with the human body must be avoided.
3.3	Chronic exposure to high concentrations of manganese may lead to Manganism, a disease of the central nervous system.
3.4	Possibility of skin irritation by sensitive persons.
3.5	May cause eye irritation.
4.	FIRST AID MEASURES
4.1	Inhalation : If inhaled, remove to fresh air. Gargle with water and clean nasal cavity. If difficulty with breathing is experienced, give oxygen and seek medical attention.
4.2	Eyes : Immediately irrigate eyes with 0.9% w/w sterile solution of sodium chloride or clean water. If foreign body cannot be removed by flushing or if irritation persists, seek medical attention.
4.3	Skin : Flush skin with water and wash thoroughly with soap or mild detergent and water, consult physician if irritation persists.
4.4	Ingestion : If swallowed, give large quantities of water or milk. Call physician. Chelation with calcium sodium ethylenediamine tetraacetic acid has been shown to reduce some of the neurological effects of manganism (Cook, Fahn, Brait, 1974).
5.	FIRE FIGHTING MEASURES
5.1	Fire and Explosion Characteristics : Not listed.
5.2	Extinguishing Media : Use extinguishing media suitable for the type of fire.
5.3	Fire Prevention : Not listed.
6.	ACCIDENTAL RELEASE MEASURES
	Spilled MM12 may be collected and re-used. Spilled MM12 particulate should be promptly collected taking care not to generate the suspension of dust. Dry clean material can be re-used. Contaminated material should be disposed off as described in section 13.
7.	HANDLING AND STORAGE
7.1	Storage : Keep in closed, dry container. Store in dry area, away from moisture.

7.2	Handling : Soluble in concentrated mineral acids and in dilute acids in the presence of reducing agents. Use in well-ventilated area to keep dust below exposure limits. Do not allow dust or powder to accumulate on equipment or building surfaces.	
8.	EXPOSURE CONTROLS / PERSONAL PROTECTION	
8.1	Exposure Controls : Manganese OES 8 hr TLV-TWA 0.2 mg/m ³ .* Where it is possible that the Occupational Exposure Standard may be exceeded local exhaust ventilation must be provided. <div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: fit-content;"> <p>*ACGIH 1998 TLVs and BEIs: Threshold Limit Values for Chemical Substances and Physical Agents.</p> </div>	
8.2	Respiratory Protection : Any dust and mist respirator except single-use and quarter-mask respirators for concentrations up to 10 mg/m ³ . Any supplied-air respirator for concentrations up to 25 mg/ m ³ . Any air-purifying, full-facepiece respirator with high-efficiency particulate filter for concentrations up to 50 mg/ m ³ . Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure demand or other positive-pressure mode for concentration up to 500 mg/m ³ .	
8.3	Hand Protection : Gloves suitable for the application.	
8.4	Eye Protection : Use safety spectacles to BS2091. During foundry operations goggles or Face Shield to BS2091 1 M should be used.	
8.5	Skin Protection : Wear flame and fireproof cotton drill overalls.	
9.	PHYSICAL AND CHEMICAL PROPERTIES	
9.1	PHYSICAL STATE	: Solid powder (fine).
9.2	ODOUR AND APPEARANCE	: No odour. Brown.
9.3	ODOUR THRESHOLD	: Not listed.
9.4	DENSITY	: 4.5
9.5	CO-EFFICIENT OF WATER/OIL DISTRIBUTION	: Not listed.
9.6	VAPOUR PRESSURE (mm Hg)	: Not listed.
9.7	FLAMMABILITY	: Not listed.

9.8	AUTO-FLAMMABILITY	: Not listed.
9.9	BOILING POINT	: Not listed.
9.10	MELTING POINT	: Not listed.
9.11	pH	: Not listed.
9.12	VAPOUR DENSITY (Air = 1)	: Not listed.
9.13	EVAPORATION RATE (BuAc = 1)	: Not applicable.
9.14	VOLATILES, %	: Not applicable.
9.15	SOLUBILITY IN WATER	: < 10 ⁻² g/l.
10.	STABILITY AND REACTIVITY	
10.1	Stability : Stable under normal conditions. Decomposes to MnO in N ₂ at 1500 °C. Oxidises to MnO ₃ in air at 600 °C (Kinetically slow).	
10.2	Incompatible materials : Not listed.	
10.3	Conditions of reactivity : Soluble in concentrated mineral acids and dilute acids in the presence of reducing agents (SO ₂ and H ₂ O ₂). Soluble in HCl with evolution of chlorine.	
10.4	Hazardous decomposition products : Decomposes to MnO in N ₂ at 1500 °C. Oxidises to MnO ₃ in air at 600 °C (Kinetically slow).	
10.5	Hazardous polymerization : Will not occur.	
11.	TOXICITY INFORMATION :	
11.1	Exposure limit : TLV-TWA of dust and compounds is 0,2 mg/m ³ .	
11.2	Irritancy of Product : Exposure via inhalation, ingestion and contamination of the skin and eyes may cause irritation of the respective organs.	
11.3	Inhalation : Inhalation of fumes or dust causes chills, fever, nausea, vomiting, coughing, weakness, muscular pain and headaches.	
11.4	Skin : Exposure causes skin irritation.	
11.5	Ingestion : Harmful if swallowed.	
11.6	Chronic effects : Massive dose or long-term exposure to dust - Poisoning via blood leading to mental deficiency and nervous disorder.	

11.7	Carcinogenicity : Not listed by IARC and ACGIH as carcinogen.
11.8	Reproductive effects, Teratogenicity, Mutagenicity : Not listed.
11.9	Sensitisation to Product : Not listed.
11.10	Name of Toxicologically SYNERGISTIC Products : Not listed.
11.11	Restrictive Medical Conditions : Eye, skin, respiratory kidney or liver diseases or disorders would be aggravated by repeated or prolonged exposure to this chemical. Persons with history of alcoholism, psychiatric, neurological or liver dysfunction would be expected to be at increased risk from exposure.
12.	ECOLOGICAL INFORMATION :
	Highly water polluting substance, classification because of a lack of data. WGK = 3*
13.	DISPOSAL CONSIDERATIONS :
13.1	Residues containing valuable recoverable metals and should be forwarded for recycling. The waste container should be labeled H. Alternatively the waste should be disposed of in a permitted chemical waste facility in accordance with the requirements of federal, provincial and local government.
14.	TRANSPORT INFORMATION :
	UN No: Not listed. RID/ADR : Not listed. IATA/ICO: Not listed. EINECS: Not listed.
15.	REGULATORY INFORMATION :
	Classification : Not classified in the C.P.L. Approved List Risk Phrases : 20/22/48. Safety Phrases : 20/22/26.
16.	OTHER INFORMATION :
	Prepared by : Manganese Metal Company (Pty) Ltd. Telephone : +27 013 7594600 Preparation date : August 2003.

17	REFERENCES :
17.1	Cook DG, Fahn S, Brait KA: Chronic manganese intoxication, <i>Arch Neurol</i> 30: 59-64,1974.
17.2	ACGIH, 1998 TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents.
17.3	NIOSH Pocket Guide to Chemical Hazards 1994.
17.4	Luxon SG, Hazards in the Chemical Laboratory, 5 th Edition.
17.5	Weiss G, Hazardous Chemicals Data Book, 2 nd Edition.
17.6	Hamilton & Hardy. Industrial Toxicology, 5 th Edition.
17.7	MERCK Reagents, Chemicals and Diagnostics, 1996.
17.8	MERCK INDEX 12: 5776.

Notice to the Reader

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