MANGANESE METAL COMPANY

Manganese Metal Company (Pty) Ltd
Registration No. 1971/006609/07

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MATERIAL SAFETY DATA SHEET

Nitrided Manganese Briquettes

1.	**IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND OF THE COMPANY**
1.1	**Identification of the substance or preparation** :
1.1.1	**Product Name** : Nitrided Manganese Briquettes, NHD98, Nitroquettes.
1.1.2	**Chemical Name** : Nitrided Metallic Manganese.
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	7439-96-5	91 - 95	Xn: Harmful	R : 10, 15, 15.1, 20, 22, 48. S : 3, 8, 9, 14.2, 14.5, 14.6, 15, 16, 20, 21, 22.
	Nitrogen (as nitrided, Mn_4N)		5 - 8	Not listed	

3.	**HAZARDS IDENTIFICATION**
3.1	Inhalation : May cause irritation to the respiratory organs.
3.2	Ingestion : Swallowing or absorption trough 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 plenty of water. Call physician.
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 :** Manganese will not ignite whilst in solid form. Finely divided Manganese may ignite in the presence of any spark or flame and present an explosion hazard when concentrated and in suspension in air. Water reacts with Manganese releasing highly flammable hydrogen gas, which may give rise to an explosion.
5.2	**Extinguishing Media :** DO NOT USE WATER, FOAM, HALOGENATED GAS OR CARBON DIOXIDE. Burning manganese should be extinguished by smothering with dry agents such as Class D dry powder extinguisher, melting flux, sand or Talc (Magnesium Trisilicate). Pressurised extinguishers, with a slow discharge rate should be used to avoid scattering burning material and spreading the fire. When applying the extinguishing medium by hand do so carefully to avoid scattering the burning material.
5.3	**Fire Prevention** : Keep Manganese particulate away from flames, sparks and sources of heat. Avoid suspension of Manganese dust or powder in the air as this may create an explosive mixture. Avoid accumulation of manganese dust by good housekeeping. Smoking should be prohibited.

6.	**ACCIDENTAL RELEASE MEASURES**
	Spilled Manganese may be collected and re-used. Spilled Manganese particulate should be promptly collected, using a natural fiber brush and non-sparking dustpan. Dry clean material can be re-used. Wet or otherwise contaminated material should be placed in a well-ventilated steel container and stored in a safe outside area physically separated from other activities. Wet Manganese particulate will oxidise, generate heat and liberate hydrogen gas, which may auto-ignite.
7.	**HANDLING AND STORAGE**
7.1	**Storage :** Keep in closed, dry container. Store in dry area, away from moisture.
7.2	**Handling :** Incompatible with acids, aqueous solutions, halogen gases, alkalis, hydrogen peroxide. Use 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. *ACGIH 1998 TLVs and BEIs Threshold Limits for Chemical Substances and Physical Agents.
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 fire proof cotton drill overalls without external pockets or flaps in which powder or dust may collect.

9.	**PHYSICAL AND CHEMICAL PROPERTIES**	
9.1	PHYSICAL STATE	: Solid.
9.2	ODOUR AND APPEARANCE	: Gray cuboids or briquettes approximately (50 X 50)mm.
9.3	ODOUR THRESHOLD	: Not listed.
9.4	DENSITY	: 7
9.5	CO-EFFICIENT OF WATER/OIL DISTRIBUTION	: Not listed.
9.6	VAPOUR PRESSURE (mm Hg)	: Not listed.
9.7	FLAMMABILITY	: Powder or dust may ignite in the presence of a flame or spark.
9.8	AUTO-FLAMMABILITY	: Wet material release hydrogen gas, which may auto-ignite.
9.9	BOILING POINT	: 1 900 °C
9.10	MELTING POINT	: 1 300 °C
9.11	PH	: Not listed.
9.12	VAPOUR DENSITY (Air = 1)	: Not listed.
9.13	EVAPORATION RATE (BuAc = 1)	: Not listed.
9.14	VOLATILES, %	: Not listed.
9.15	SOLUBILITY IN WATER	: Decomposes slowly.
10.	**STABILITY AND REACTIVITY**	
10.1	**Stability** : Stable under normal conditions. Nitrided manganese is less reactive than pure manganese.	
10.2	**Incompatible materials** : Water or steam, chloride, fluoride, hydrogen peroxide, all acids, nitrous oxide, phosphorous vapour and sulphur dioxide. All alkalis.	
10.3	**Conditions of reactivity :** Dust or powder is ignitable, dust may be pyrophoric in air and may explode when heated in carbon dioxide. Reacts with water and steam.	
10.4	**Hazardous decomposition products :** Reaction with water and steam produces hydrogen gas, a highly flammable gas. Reaction with steam produces incandescence and high temperature. Reaction with alkali (e.g. caustic soda) or water if sodium silicate binder is present will generate ammonia fumes, which are toxic, corrosive and flammable.	

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. Also possible exposure to ammonia.
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 causes chills, fever, nausea, vomiting, coughing, weakness, muscular pain and headaches.
11.4	**Skin :** Exposure causes skin irritation.
11.5	**Chronic effects :** Massive dose or long-term exposure to dust - Poisoning via blood leading to mental deficiency and nervous disorder.
11.6	**Carcinogenicity :** Not listed by IARC and ACGIH as carcinogen.
11.7	**Reproductive effects, Teratogenicity, Mutagenicity :** An experimental tumorigen and mutagen.
11.8	**Sensitisation to Product :** Not listed.
11.9	**Name of Toxicologically SYNERGISTIC Products :** Not available.
11.10	**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 **EINECS:** 2311051. **RID/ADR :** Not listed. **IATA/ICO:** Not listed.

15.	**REGULATORY INFORMATION :**
	Classification : LGK 10 - 13 Risk Phrases : 10/15/15.1/20/22/48. Safety Phrases : 2/8/9/14.2/14.5/14.6/15/16/17/20/21/22.
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, *Arch Neurol* 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, 5th Edition.
17.5	Weiss G, Hazardous Chemicals Data Book, 2nd Edition.
17.6	Hamilton & Hardy. Industrial Toxicology, 5th Edition.
17.7	MERCK Reagents, Chemicals and Diagnostics, 1996.
17.8	MERCK INDEX 12:5762.