



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

P O Box 323 Nelspruit 1200
 Republic of South Africa
 Telephone (013) 759-4600
 Telefax (013) 752-7657
 Website www.mmc.co.za

MATERIAL SAFETY DATA SHEET Aluminum Chrome Briquettes

| | | | | | |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|----------------------|-------------------------------|
| 1. | IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND OF THE COMPANY | | | | |
| 1.1 | Identification of the substance or preparation : | | | | |
| 1.1.1 | Product Name : Aluminum Chrome Briquettes. | | | | |
| 1.1.2 | Chemical Name : Metallic chromium and aluminum. | | | | |
| 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 |
| | Chromium | 7440-47-3 | 75 | None | None |
| | Aluminum | 7429-90-5 | 25 | F: Highly flammable | R : 10 -15. S : 7, 8, 43.6 |

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 | Possibility of skin irritation by sensitive persons. |
| 3.4 | May cause eye irritation. |
| 3.5 | Can be a fire hazard when in a finely divided form. |
| 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. |
| 5. | FIRE FIGHTING MEASURES |
| 5.1 | Fire and Explosion Characteristics : Aluminum will ignite in the presence of an open flame. |
| 5.2 | Extinguishing Media : DO NOT USE WATER, FOAM, HALOGENATED GAS OR CARBON DIOXIDE. Burning aluminum 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. Keep containers cool and beware of re-ignition. |
| 5.3 | Fire Prevention : Keep aluminum particulate away from flames, sparks and sources of heat. Avoid accumulation of aluminum dust by good housekeeping. Smoking should be prohibited. |
| 6. | ACCIDENTAL RELEASE MEASURES |
| | Spilled briquettes may be collected and re-used. Spilled briquette 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. |

| | | |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| 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 : Aluminum OES 8 hr TLV-TWA 10 mg/ m ³ .* Where it is possible that the Occupational Exposure Standard may be exceeded local exhaust ventilation must be provided. Chromium is harmful in large quantities. | |
| | <div style="border: 1px solid black; padding: 10px; width: fit-content; margin: 0 auto;"> <p>*ACGIH TLVs and BEIs Threshold Limits for Chemical Substances and Physical Agents.</p> </div> | |
| 8.2 | Respiratory Protection : Where dusty atmospheres are experienced dust masks to EN149 FFP2 may be used. | |
| 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 | : Steel-grey cuboids or briquettes approximately (50 X 50)mm. |
| 9.3 | ODOUR THRESHOLD | : Not applicable |
| 9.4 | DENSITY | : 7.20 g/cm ² . |
| 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 | : Not listed. |
| 9.9 | BOILING POINT | : 2 672 °C |
| 9.10 | MELTING POINT | : 1 857 °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 | : Insoluble. |
| 10. | STABILITY AND REACTIVITY | |
| 10.1 | Stability : Stable under normal conditions. | |
| 10.2 | Incompatible materials : Chromium is very resistant to oxidation but will dissolve in non-oxidising acids and reacts with oxygen, halogens, S etc. Aluminum is almost not attacked by water but traces of impurity induce corrosion. Corroded by sodium chloride and dissolved by acids. Reacts with caustic soda. | |
| 10.3 | Conditions of reactivity : Aluminum will ignite in the presence of an open flame. | |
| 10.4 | Hazardous decomposition products : None. | |
| 10.5 | Hazardous polymerization : Will not occur. | |
| 11. | TOXICITY INFORMATION : | |
| 11.1 | Exposure limit : TLV-TWA of aluminum is 10 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 : | |
| 11.4 | Skin : Exposure causes skin irritation. | |
| 11.5 | Chronic effects : Finely divided aluminum powder can cause pulmonary fibrosis. | |
| 11.6 | Carcinogenicity : Not listed by IARC and ACGIH as carcinogen. | |

| | |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11.7 | Reproductive effects, Teratogenicity, Mutagenicity : Aluminum - Reproductive poisoning on mouse : inhalation TCL 49 mg/m ³ .* <div style="border: 1px solid black; padding: 5px; margin: 5px 0;">* REFERENCE, Experimental Biology V1 - 46 (1942 -87)</div> |
| 11.8 | Sensitisation to Product : Not listed. |
| 11.9 | Name of Toxicologically SYNERGISTIC Products : Not listed. |
| 11.10 | Restrictive Medical Conditions : |
| 12. | ECOLOGICAL INFORMATION : |
| | Chromium - Non-water-polluting substance. WGK = 0. Aluminum - Non-water-polluting substance. WGK = 0. |
| 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: 1396 EINECS: 2311575. RID/ADR : 4.3/13 b IATA/ICO: 4.3 UN 1396 PAX 415 CAO 417. |
| 15. | REGULATORY INFORMATION : |
| | Classification : LGK 10 - 13. Risk Phrases : 15/17 Safety Phrases : 7/8/43.6 |
| 16. | OTHER INFORMATION : |
| | Prepared by : Manganese Metal Company (Pty) Ltd. Telephone : +27 013 7594600 Preparation date : August 2003. |
| 17. | REFERENCES : |
| 17.1 | ACGIH, 1998 TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents. |
| 17.2 | NIOSH Pocket Guide to Chemical Hazards 1994. |
| 17.3 | Luxon SG, Hazards in the Chemical Laboratory, 5 th Edition. |
| 17.4 | Weiss G, Hazardous Chemicals Data Book, 2 nd Edition. |
| 17.5 | Hamilton & Hardy. Industrial Toxicology, 5 th Edition. |

| | |
|------|--------------------------------------------------|
| 17.6 | MERCK Reagents, Chemicals and Diagnostics, 1996. |
| 17.7 | MERCK INDEX 12:331. |
| 17.8 | Experimental Biology V1 - 46 (1942 -87) |

Notice to the Reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability for the emergency or completeness of the information described herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.