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Revision N°.: 3	HAZARD DATA SHEET – NICKEL BRIQUETTES
Effective Date: 01/07/00	Document N°.: MAN-HDS-004 Software file: g:\quality\sheq\hds\004
REVISED BY: S FINNEY/ S ENGELBRECHT	APPROVED BY: Ni OPERATIONS MANAGER – BMR



1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product Description

Nickel Briquettes

1.2 Supplier Details

Impala Platinum Ltd – Refineries

Base Metals Refinery
P.O. Box 222
SPRINGS
1560
GAUTENG
Republic of South Africa

Tel.: +27 11 360 3777
Fax.: +27 11 360 3495

Head Office

Implats
P.O. Box 61386
MARSHALLTOWN
2107
GAUTENG
Republic of South Africa

Tel.: +27 11 481 3911
Fax.: +27 11 484 0340
Cell.: +27 82 445 2228

1.3 Contact Persons

Refineries - Senior Operations Manager Base Metals Refinery
Head Office - Senior Manager Worldwide Marketing

1.4 Emergency Contact Information

For emergency information – see above for contacts

2. COMPOSITION / INFORMATION ON INGREDIENTS

- 2.1 **Ingredient:** Nickel
2.2 **Formula:** Ni
2.3 **CAS N°:** 7440-02-0

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4. **Synonyms:** Ni ingots.

2.5 **Use(s):** Printing Industry, Metal Alloys, Nickel Plating, Ceramic Manufacture.

2.6 **Poison Sched.:** None Allocated
Hazchem.: None Allocated
U.N. # : None Allocated
D.G Class: None Allocated
PKG Group: None Allocated
EPG: None Allocated
Sub/Tert. Risk: None Allocated

3. **HAZARDS IDENTIFICATION**

Health Hazard Summary

Moderate Toxicity. Due to product form an inhalation hazard is not anticipated unless dust is produced. Use safe work practices to avoid skin contact and dust generation. Insoluble nickel is classified as possibly carcinogenic to humans (IARC Group 2B). Skin and respiratory sensitiser. Those individuals with pre-existing lung or skin sensitivities – disease are advised to avoid exposure.

3.1 **Eye**

Not applicable. Product may only present a hazard if dust or fumes are generated (e.g. when crushed or ground).

3.2 **Inhalation**

Not applicable. Due to product form an inhalation hazard is not anticipated. Product may only present a hazard if dust or fumes are generated. Over exposure to dusts or fumes may result in mucous membrane irritation of the respiratory tract.

3.3 **Skin**

Irritant. Repeated contact may result in irritation, dermatitis with severe itching and possible sensitisation.

3.4 **Ingestion**

Not applicable. Product may only present a hazard if dust is generated. Ingestion of dust may result in gastric irritation, ulceration and burns to the mouth and throat. Nickel is poorly absorbed through the stomach.

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4. **FIRST AID MEASURES**

4.1 **Eye**

Not applicable.

4.2 **Inhalation**

Not applicable. Due to product form, acute inhalation symptoms are not anticipated.

4.3 **Skin**

Remove contaminated clothing and gently flush affected areas with soap and water. Seek medical attention if irritation develops. Launder clothing before reuse.

4.4 **Ingestion**

Due to product form and application, ingestion is considered highly unlikely.

5. **FIRE FIGHTING MEASURES**

5.1 **Fire and Explosion**

Non flammable. No fire or explosion hazard exists.

5.2 **Extinguishing**

Non flammable.

6. **ACCIDENTAL RELEASE MEASURES**

6.1 **Spillage**

Not applicable.

6.2 **Environment**

AQUATIC: Mobility of nickel is controlled by various sorbents which scavenge it from solution. In pristine environments, hydrous oxides of iron & manganese control its mobility via sorption & co-precipitation. In polluted environments, the most abundant organic material will keep nickel soluble. Nickel is one of the most mobile heavy metals in aquatic environments and can persist indefinitely in natural waters. It is toxic to plants at 50-200ppm.

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7. HANDLING AND STORAGE

7.1 Packaging Material

Sintered Briquettes: Packed in black 250kg drums and loaded in 1000kg lots on a pallet. Each drum sealed with a plastic numbered seal and a lead seal.

Unsintered Briquettes: Packed in bags and loaded in 1000kg lots on a pallet.

Air Sintered Briquettes: Packed in bags and loaded in 1000kg lots on a pallet. Bulk product emptied into a tipper.

7.2 Storage

Store in cool, dry, well ventilated area, removed from oxidising agents, acids, and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use.

7.3 Transport

Not regulated for transport purposes.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Occupational Exposure Limits

SA Legislation according to the OHS Act: Ni soluble = 0.1 mg/m³
Ni insoluble = 0.5 mg/m³
Ni metal = 0.5 mg/m³

ACGIH 1999/00 legislation: Ni soluble = 0.1 mg/m³
Ni insoluble = 0.2 mg/m³
Ni metal = 1.5 mg/m³

8.2 PPE

Wear coveralls and rubber or leather gloves. Where a dust risk or in an industrial situation, wear dust-proof goggles. Where a dust inhalation exists, wear a Class P2 (Particulate) respirator.

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9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Small silver-grey ingots or briquettes
Odour	:	Odourless
Flammability	:	Non Flammable
Flash Point	:	Not Relevant
Boiling Point	:	2730 °C
Melting Point	:	1455 °C
Exposure Standard (TWA)	:	0.5 mg/m ³ (insoluble nickel)
Evaporation Rate	:	Not Relevant
pH	:	Not Relevant
% Volatiles	:	Not Relevant
Specific Gravity	:	8.9
Vapour Pressure	:	Not Relevant
Solubility	:	Insoluble
Lower Explosion Limit	:	Not Relevant
Upper Explosion Limit	:	Not Relevant
Molecular Weight	:	58.71
Ni concentration – sintered	:	>=99.80%
Ni concentration – unsintered	:	>=99.70%
Ni concentration – airsintered	:	>=99.70%

10. STABILITY AND REACTIVITY

10.1 Flammability

Non flammable. Will evolve toxic metal oxides when heated to decomposition.

10.2 Reactivity

Incompatible with oxidising agents (e.g. hypochlorites, peroxides) and acids (e.g. sulfuric acid).

10.3 Ventilation

No special precautions are required unless dust or fumes are generated. When dust or fumes generation occurs, mechanical extraction ventilation is recommended.

11. TOXICOLOGICAL INFORMATION

Nickel is classified as possibly carcinogenic to humans (IARC Group 2B), however insoluble nickel is classified as Carcinogenic to humans (IARC Group 1). Skin irritation may occur some 7 days before skin eruptions appear. The skin may become blotchy with inflamed hair follicles. Recovery from dermatitis usually occurs within 7 days although this may be delayed. Early inhalation symptoms include nausea, giddiness, weakness, non productive cough, followed by breathing difficulties, pulmonary oedema and interstitial fibrosis. Half life in the body: 667 days.

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11.1 Health Hazards - Ingestion

Large doses, 1-3 mg/kg of nickel compounds have been reported to have caused intestinal disorders, convulsions & asphyxia in dogs.

TDL_o (Ingestion) : 158 mg/kg (rat – foetotoxic)
LDL_o (Ingestion) : 5 mg/kg (guinea pig)

11.2 Health Hazards - Inhalation

Nickel is classified as possibly carcinogenic to humans (IARC Group 2B) and nickel compounds are carcinogenic to humans (IARC Group 1). Heart, brain, liver and kidney damage reported in animals. Exposure to dust / fumes may result in asthma and pneumonitis. Mutagen.

TWA : 0.5mg/m³ (nickel metal)
TCL_o (Inhalation) : 15 mg/m³/91W-I (guinea pig – tumours)

11.3 Health Hazards – Toxicity Data

LD₅₀ (Intraperitoneal) : 250 mg/kg (rat)
LDL_o (Subcutaneous) : 7.5 mg/kg (rabbit)

12. ECOLOGICAL INFORMATION

12.1 Atmosphere

Contributions to atmospheric loading come from both natural sources and anthropogenic (human) activity. 0.03% of the particulate matter in the atmosphere. Removed by dry and wet precipitation processes.

12.2 Soil

Abundance in earth's crust 0.018%.

12.3 Biological

Aquatic toxicity LC₅₀ (fathead minnow) = 27-32 ppm/96 hours,
LC₅₀ (prawn) = 13.9 ppm/48 hours.
Toxic to citrus plants.

13. DISPOSAL CONSIDERATION

Reuse where possible, or return to the manufacturer or supplier. Alternatively, dispose of to an approved land site. Contact Impala Refineries on +27 11 360 3777 for additional specific information

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14. **TRANSPORT INFORMATION**

Not regulated for transport purposes.

15. **REGULATORY INFORMATION**

Symbol: Xn
R-Phrases: 40-43
S-Phrases: (2)22-36

16. **OTHER INFORMATION**

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