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REVISION N°.: 9	*SAFETY DATA SHEET – NICKEL POWDER	
	DOCUMENT N°.: MAN-HDS-003	

DISTRIBUTION CONTROL SHEET

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1. **IDENTIFICATION OF THE MATERIAL AND SUPPLIER**

1.1 **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

Private Bag x18

NORTHLANDS

2116

Gauteng

Republic of South Africa

Tel.: +27 11 731 9000

Fax.: +27 11 731 9254

1.2 **Contact Persons:**

Refineries - Manager, BMR

Head Office - Marketing Executive

1.3 **Emergency Contact Information:** For emergency information – see above for contacts.

1.4 **Product Description:** Nickel Powder

1.5 **Synonyms:** 994 Nickel Powder, Impala Nickel Powder.

1.6 **Use(s):** Catalyst, Printing Industry, Metal Alloys, Nickel Plating, Ceramic Manufacture, Process Chemical, Industrial Application.

2. **HAZARDS IDENTIFICATION**

CLASSIFIED AS HAZARDOUS

NOT CLASSIFIED AS A DANGEROUS GOOD

Risk and Safety Phrases: Risk and Safety Phrases are standardised phrases allocated to Hazardous Substances. Risk phrases convey a general description of the physicochemical, environmental and health hazard of a substance. Safety phrases provide information on safe storage, handling, disposal, personal protection and first aid.

RISK PHRASES

Xn EU Symbol for harmful substances.

R40 Limited evidence of a carcinogenic effect.

R43 May cause sensitisation by skin contact.

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SAFETY PHRASES

- S2 Keep out of reach of children.
S22 Do not breathe dust.
S36 Wear suitable protective clothing.

Health Hazard Summary: Moderate Toxicity. Use safe work practices to avoid eye-skin contact and dust inhalation. Nickel is classified as possibly carcinogenic to humans (IARC Group 2B). Skin and respiratory sensitizer. Those individuals with pre-existing lung or skin sensitivities – disease are advised to avoid exposure.

- 2.1 **Eye:** Irritant. Contact may result in lacrimation, irritation, pain, redness and conjunctivitis. Prolonged contact – corneal burns and possible permanent damage.
- 2.2 **Inhalation:** Irritant – slightly corrosive. Over exposure to dusts may result in respiratory mucous membrane irritation. At high levels toxic systemic effects may occur. Nickel salts have been shown to cause an increased incidence of asthma and bronchitis, decreased pulmonary function and increased incidence of lung and nasal cancers (cancer with only insoluble nickel salts formed by chemical changes to the Nickel Powder).
- 2.3 **Skin:** Slightly corrosive – irritant. Repeated contact may result in irritation, dermatitis with severe itching and possible sensitisation.
- 2.4 **Ingestion:** Slightly toxic – slightly corrosive. Ingestion may result in gastric irritation, ulceration and burns to the mouth and throat with nausea, vomiting and abdominal pain. Nickel is poorly absorbed through the stomach.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient	:	Nickel
Formula	:	Ni
CAS N^o.	:	7440-02-0
Poison Sched.	:	None Allocated
Conc.	:	>99.80%
RTECS#	:	QR5950000
EC#	:	028-002-00-7
ICSC#	:	0062

4. FIRST AID MEASURES

- 4.1 **Eye:** Flush gently with running water, holding eyelids open for a minimum of 15 minutes. Seek immediate medical attention. **Keep patient calm.*
- 4.2 **Inhalation:** If over exposure occurs leave exposure area immediately. If minor symptoms are displayed seek immediate medical attention.
- 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:** If poisoning occurs, contact a Doctor or the Poisons Information Centre on +27 11 642 2417 or 0800 113911 (South Africa).
- 4.5 **Advice to Doctor:** Treat patient symptomatically.

5. FIRE FIGHTING MEASURES

- 5.1 **Flammability:** Non flammable. Will evolve toxic metal oxides when heated to decomposition. Dust may explode if exposed to high energy heat or ignition sources. May evolve flammable explosive hydrogen gas in contact with strong acids.

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- 5.2 **Fire and Explosion:** Non flammable. Fine dust may explode if very high levels are airborne and exposed to ignition source. Evacuate area and contact emergency services. Toxic fumes (nickel fume/nickel oxides) may be evolved. Remain upwind and notify those downwind or hazard. Wear full protective equipment (see 6.1) including Self Contained Breathing Apparatus (SCBA) when combating fire. Use water fog to cool intact containers and nearby storage areas.
- 5.3 **Extinguishing:** Non flammable. Prevent contamination of drains or waterways; absorb runoff with sand or similar (**NOT** carbon dioxide or water.)
- 5.4 **Hazchem Code:** None allocated.

6. **ACCIDENTAL RELEASE MEASURES**

- 6.1 **Spillage:** If spilt (bulk), wear dust-proof goggles, PVC/rubber gloves, a Class P2 (Particulate) respirator (or Class P3 at high dust levels) and overalls. Collect spill and place in sealable containers for disposal. Avoid generating dust. Toxic to aquatic organisms in very low concentrations. Do not flush residues to sewer. Absorbent residues
- 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.

7. **HANDLING AND STORAGE**

- 7.1 **Packaging Material:** Packed in brown 250kg drums and loaded in 1000kg lots on a pallet. Each drum sealed with a security seal
- 7.2 **Handling:** Before use, carefully read the product label. Use safe work practices to avoid eye or skin contact and inhalation. Observe good personal hygiene. Prohibit eating drinking and smoking in contaminated areas. **(e.g. if container is damaged) Wash hands before eating *or smoking.*
- 7.3 **Storage:** Store in cool, dry, well ventilated area, removed from oxidising agents (e.g. hypochlorites), acids (sulfuric acid), heat sources and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use. Large storage areas should have appropriate ventilation systems.
- 7.4 **Transport:** Not regulated for transport purposes.

8. **EXPOSURE CONTROLS / PERSONAL PROTECTION**

- 8.1 **Ventilation:** Do not inhale dust / powder. Use with adequate natural ventilation. Where a dust inhalation hazard exists, mechanical extraction ventilation is recommended. Maintain dust / fume levels below the recommended exposure limit.

8.2 **Occupational Exposure Limits:**

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

*ICS0062:
 Ni soluble = 0.1 mg/m³
 Ni insoluble = 0.2 mg/m³
 Ni metal = 1.5 mg/m³
 A5 (*not suspected as a human carcinogen) *
this conflicts with IARC below

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*IARC Group 213:

Possible carcinogen to humans – this conflicts with ICS0062 above & EU below.

EU Hazard Classification from the 30th ATP:

Acute oral:	None
Acute inhalation:	None
Skin irritation:	None
Eye irritation:	None
Skin sensitisation:	R43 = concentration limit based on release rate of 0.5µg Ni/cm ² /week
Respiratory sensitisation:	None
Chronic toxicity:	T:R48/23 = 1% concentration limit; toxic/danger of serious damage to health by prolonged exposure through inhalation
Reproductive toxicity:	None
Mutagenity:	None
Carcinogenity:	Cat3:R40 = limited evidence of a carcinogenic effect
Aquatic toxicity:	None

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8.3 **PPE:** Wear overalls, dust-proof goggles and PVC or rubber gloves. Where an inhalation risk exists, wear a Class P2 (Particulate) respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Grey/Silver Powder
Odour	:	Odourless
Flammability	:	Non Flammable
Flash Point	:	Not Relevant
Boiling Point	:	2730 °C
Melting Point	:	1455 °C
Exposure Standard (TWA)	:	1.5 mg/m ³ (*Nickel Metal)
Evaporation Rate	:	Not Relevant
pH	:	Not Relevant
%Volatiles	:	Not Relevant
Specific Gravity	:	8.90
Vapour Pressure	:	Not Relevant
Solubility (water)	:	Insoluble
Lower Explosion Limit	:	Not Relevant
Upper Explosion Limit	:	Not Relevant
Auto Ignition Temperature	:	Not Relevant
Molecular Weight	:	58.71
Ni concentration	:	>=99.80%

10. STABILITY AND REACTIVITY

10.1 **Flammability:** Non flammable. Will evolve toxic metal oxides when heated. Dusts may explode in very high concentrations if exposed to high energy heat or ignition sources. May evolve flammable – explosive hydrogen gas in contact with strong acids.

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10.2 **Reactivity:** Incompatible with oxidising agents (e.g. hypochlorites, peroxide, ammonium nitrate) and acids (e.g. sulfuric acid, hydrochloric acid) reacts slowly with non oxidising acids and more rapidly with oxidising acids. Also incompatible with nitrates, sulfur, selenium, Halogens, Halogen-Halogen Compounds, nitril compounds and organic solvents. Reacts violently in powder form with titanium powder and potassium perchlorate.

10.3 **Decomposition Products:** Will evolve toxic metal oxides when heated to decomposition.

11. TOXICOLOGICAL INFORMATION

Health Hazards Summary: Moderate Toxicity. Use safe work practices to avoid eye-skin contact and dust inhalation. Nickel is classified as possibly carcinogenic to humans (IARC Group 2B). Skin and respiratory sensitizer. Those individuals with pre-existing lung or skin sensitivities – disease are advised to avoid exposure.

11.1 **Eye:** Irritant. Contact may result in lacrimation, irritation, pain redness and conjunctivitis. Prolonged contact – corneal burns and possible permanent damage.

11.2 **Inhalation:** Irritant – slightly corrosive. Over exposure to dust may result in respiratory mucous membrane irritation and sensitisation. At high levels toxic systemic effects may occur. Nickel salts have been shown to cause an increased incidence of asthma and bronchitis, decreased pulmonary function and increased incidence of lung and nasal cancers.

11.3 **Skin:** Slightly corrosive – irritant. Repeated contact may result in irritation, dermatitis with severe itching and possible sensitisation.

11.4 **Ingestion:** Moderately toxic – slightly corrosive. Ingestion may result in gastric irritation, ulceration and burns to the mouth and throat with nausea, vomiting and abdominal pain. Nickel is poorly absorbed through the stomach.

11.5 **Toxicity Data:** NICKEL (7440-02-0), Carcinogenicity: A5 not suspected as a human carcinogen (ACGIH 2004).

12. ECOLOGICAL INFORMATION

Environment: AQUATIC - Mobility of nickel is controlled by various sorbents which scavenge it from solution. In pristine environments, hydrous oxides of iron and manganese control its mobility via sorption and 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 – 200 ppm.

13. DISPOSAL CONSIDERATIONS

13.1 **Waste Disposal:** Reuse where possible, or return to the manufacturer or supplier. Alternatively, dispose of at an approved landfill site. Contact the manufacturer for additional information.

13.2 **Legislation:** Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

Not classified as a Dangerous Good.

Hazchem. Code	:	None Allocated
U.N. #	:	None Allocated
D Class	:	None Allocated
PKG Group	:	None Allocated
EPG	:	None Allocated
Sub/Tert. Risk	:	None Allocated

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15. REGULATORY INFORMATION

15.1 **AICS:** Symbol : Xn.
R-Phrases : 40-43.
S-Phrases : (2)22-36.

15.2 **Poison Schedule:** A poison schedule number has not been allocated to this product.

16. OTHER INFORMATION

16.1 **Nickel Exposure 1:** NIOSH-USA recommended that workers exposed to Nickel and inorganic nickel compounds should have an initial medical exam covering.

1. Comprehensive medical and work history with emphasis on skin conditions, allergies, upper and lower respiratory tract illnesses and smoking.
2. Complete physical exam with emphasis on upper respiratory tract and skin.
3. Specific clinical tests such as X-ray, pulmonary function and indicated sputum cytology and urine nickel analysis.

16.2 **Nickel:** Reported and potential adverse health effects associated with occupational exposure to Nickel metal and inorganic compounds include; an increased risk of nasal, lung and possibly laryngeal cancer in nickel refinery workers; increased risk of gastric cancer; increased risk of sarcoma (cancer arising from connective tissue); severe irritation of the upper respiratory tract; pulmonary irritation and fibrosis; pneumoconiosis; bronchial asthma; increased susceptibility to respiratory infections; and dermatitis.

16.3 **Respirators:** In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

16.4 **Colour Rating System:** Amber. Chem Alert reports are assigned a colour rating of Green, Amber or Red for the purpose of providing users with a quick and easy means of determining the hazardous nature of a product. Safe handling recommendations are provided in all Chem Alert reports so as to clearly identify how users can control the hazards and thereby reduce the risk (or likelihood) of adverse effects. As a general guideline a Green colour rating indicates a low hazard, and Amber colour rating indicates a moderate hazard and a Red colour indicates a high hazard.

Whilst all due care has been taken in the preparation of the Colour Rating System, it is intended as a guide only and does not provide any warranty in relation to the accuracy of the Colour Rating System. As far as is lawfully possible, Impala accepts no liability or responsibility whatsoever for the actions or omissions of any person in reliance on the Colour Rating System.

16.5 **Personal Protective Equipment Guidelines:** The recommendation for protective equipment contained within this Chem Alert report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made. Information provided by Risk Management Technologies is summarised for ease of use. Additional technical information is available by calling +27 11 360 3377.

16.6 **Health Effects from Exposure:** It should be noted that the effects from exposure to this will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a Chem Alert report which encompasses all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

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- 16.7 **Abbreviations:** mg/m³ – Milligrams per cubic metre.
ppm – Parts Per Million.
TWA/ES – Time Weighted Average of Exposure Standard.
pH – Relates to hydrogen ion concentration - this value will relate to a scale of 0 – 14, where 0 is highly acidic and 14 is highly alkaline.
CAS# - Chemical Abstract Service number – used to uniquely identify chemical compounds.
M – Moles per litre, a unit of concentration.
IARC – International Agency for Research on Cancer.
RTECS – The Registry of Toxic Effects of Chemical Substances
ICSC – International Chemical Safety Card.
EC – Enzyme commission
EU – European Union

Report Reviewed: *14 March 2009.

- 16.8 **Report Status:** Impala Platinum Ltd. have exercised reasonable care in the preparation of the information contained in this SDS, however, it assumes no responsibility or liability to the accuracy and suitability of such information, for application to the Buyer's intended purposes or consequences of its use. As regulatory standards and guideline recommendations are revised from time to time, Impala gives no assurance that the information contained in this SDS will be current at the time that the SDS is used. It is the responsibility of the Buyer/User to ensure that the most recent version of this document is available.

The data in this SDS relates only to the specific material designated herein and does not relate to use in combination with other materials and in any process. Impala assumes no responsibility for any physical or chemical changes, which the Buyer/User may make to the material designated in this SDS. Since use of this SDS information and the opinions and conditions of the use of the product are not within the control of Impala Platinum Ltd., the Buyer/User is obligated to determine the conditions of safe use of the product.