DISTRIBUTION CONTROL SHEET

Nº	LOCATION	TITLE
1	SHEQ Manger	SHEQ Manager (Electronic)
2	Despatch	Process Supervisor (Electronic)
3	Plant Manager's Office	Plant Manager - Platinum (Electronic)
4	Manager PMR	Manager PMR Snr (Electronic)
5	Lab Manager's Office	Laboratory Manager (Electronic)
6	Marketing	Marketing Executive Manager (Electronic)
7	Marketing	Sales Admin Superintendent (Electronic)
8	IRS	IRS Superintendent (Electronic)
9	Head Office	Group Head Investor Relations and Corporate Communications (Hardcopy)

NOTE: This quality-controlled document is available on SAP. Notification of distribution records, as sent to all parties identified, are kept.

Product code	:	Not applicable
Version	:	1
Date of issue	:	02/09/2025
Date of previous issue	:	No previous validation

SECTION 1: Identification of the substance / mixture and of the company /. undertaking

1.1. Product Identifier

Product name	:	Palladium Powder
Synonyms	:	Impala Palladium, Palladium Metal
EC number	:	Not Applicable
UK (GB) REACH Registration number	:	UK-01-8768321759-7-0001
Legal Identity	:	Not Applicable
CAS number	:	Not Applicable
Product code	:	Not Applicable
Product type	:	Palladium
Other means of identification	:	Palladium Metal

1.2. Relevant Relevant identified uses of the substance or mixture and uses advised against Specific uses

Catalytic reactions in industry, such as in hydrogenation of unsaturated hydrocarbons, as well as alloys in jewellery, dental fillings and crowns. Palladium also used as catalytic converters in car exhaust systems and as component in fuel cells.

1.3. Details of the supplier of the safety data sheet

Supplier Name : Impala Platinum Ltd – Refineries

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

Contact Person (s) :
Laboratory Manager – Jamie Welman
Tel: +27 11 360 3255
E-mail: jamie.welman@implats.co.za

:
Palladium Section Manager – Rayen Ramlugan
Tel: +27 11 360 3172
E-mail: rayen.ramlugan@implats.co.za

1.4. Emergency telephone number

See above for Refineries contacts.
South Africa Poisons Information Centre 0861-555-777 (South Africa only)

SECTION 2: Hazard Identification

2.1. Classification of the substance or mixture

Product definition : GHS Classification (SANS 10234)

Classification according to GHS (SANS10234):
Health hazards:

Acute toxicity, oral	Category 1	H303- May be harmful if swallowed.
Respiratory sensitisation	Category 1	H333 – May be harmful if inhaled.
Skin sensitisation	Category 1	H317- Prolonged skin contact may cause an allergic skin reaction.
Environmental hazards:	Category 4	H413 - May cause long lasting harmful effects in aquatic life.

Hazard Summary: Not classified for physical hazards.

Health hazards: May be harmful if swallowed and/or inhaled. May cause skin irritation during dust generation.

Environmental hazards: May cause long lasting adverse effects in aquatic environment.

Specific hazards: If dissolved, ensure adequate enclosure or ventilation; do not breathe the mists and avoid solution contact with eyes, skin and clothing – may cause sensitization or allergic reaction. If melted do not inhale furnace fumes.

2.2. Label elements

Hazard Pictograms :

Signal word : Danger

Hazard health statements :
- H303 - May be harmful if swallowed.
- H317- May cause an allergic skin reaction.
- H333- May be harmful if inhaled.

Precautionary statements Prevention :
- P201- Obtain special instruction before use.
- P202- Do not handle until all safety precautions have been read and understood.
- P261- Avoid breathing dust/fume.
- P264- Wash thoroughly after handling.
- P270- Do not eat, drink or smoke when using this Product.
- P273- Avoid release to the environment.
- P280- Wear protective gloves, protective clothing and eye protection.
- P285- In case of inadequate ventilation wear respiratory protection.

Response :
- P330- Rinse mouth.
- P363- Wash contaminated clothing before re-use.

P302+P352 – IF ON SKIN: Wash well with plenty of soap and water
P308+P313-If exposed or concerned get medical

Advice / attention.
P304+P340- IF INHALED: Remove to fresh air and keep at rest in a comfortable position for breathing.
P30+P351+P338 – IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P337+P313- If eye irritation persists get medical advice/attention.
P333+P313- If skin irritation or rash occurs get medical advice/attention.

Storage : Not applicable.

Disposal : Dispose of contents / container to hazardous or special waste collection point**.**

Supplemental label elements : None

2.3. Other Hazards

Not BPT or vPvB substance or mixture. Take care when dissolving palladium metal/powder. Ensure to get the necessary safety data for the specific salts in solution. Wear the required personal protective equipment when doing so. No other acute or chronic health impact noted.

SECTION 3: Composition / Information on Ingredients

3.1. Substances

Ingredients	:	Palladium
Formula	:	Pd
CAS Nº	:	7440-05-3
Poison Sched	:	Non allocated
Conc.Pd	:	≥99.95%
RTECS Nº	:	RT 3480500
EC No	:	231-115-6
Hazchem	:	None Allocated
UN Nº	:	None Allocated
D.G Class	:	None Allocated
PKG Group	:	None Allocated
EPG	:	None Allocated
Sub/Tert.Risk	:	None Allocated

SECTION 4: First aid measures

4.1. Description of first aid measures

Eye contact : Flush gently with running water for a minimum of 15 minutes.
Seek medical attention if irritation develops.

Inhalation : If over exposure occurs leave exposure area immediately.
If other than minor symptoms are displayed seek immediate medical attention.

Skin contact : Remove contaminated clothing and gently flush affected areas with soap and water.

Seek medical attention of irritation develops.
Launder clothing before reuse.

Ingestion : Seek immediate medical attention if ingestion occurs.
Do not induce vomiting.

First Aid Facilities: Eye was facilities should be available.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Flash Point	:	Not applicable
Flammable Limits	:	Not applicable
Auto-ignition Point	:	Not applicable
Fire Extinguishing Media	:	Non-flammable
Special Fire Fighting Procedures	:	None
Hazardous Chemical Code	:	None allocated

Note : Unlike some finely divided Palladium powder supplied by other companies, the material supplied by Impala Platinum is non-flammable and therefore DOES NOT present a fire hazard.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions : If spilt (bulk) wear goggles and PVC or rubber gloves.
Where a dust inhalation hazard exists (i.e. when used in large quantities) wear a Class P1 (particulate) respirator.

6.2. Environmental precautions

Environmental precautions : May cause long lasting harmful effects in aquatic life.
Do not flush residues to drains.
Absorb all residues.

6.3 Methods and material for containment and cleaning up

Solid Spill : Sweep up and place in sealed container.

Solution spill : Absorb with moist sand or similar and place in sealed containers for reprocessing or recovery.

SECTION 7: Handling and Storage

7.1. Precautions for safe handling

Packaging Material: : Packed in plastic bags sealed in tins which in turn are sealed in boxes.

Handling: : Before use, read the product label.
Use safe work practices to avoid eye or skin contact and inhalation of dust or fumes.
Observe good personal hygiene.
Prohibit eating, drinking and smoking in contaminated areas (e.g. if container is damaged).
Wash hands before eating or smoking.

Storage: : Store in tightly sealed containers in a cool, dry and well-ventilated area removed from formic acid, sodium borohydride, active metals (e.g. Aluminium), hydrogen peroxide, ignition sources and foodstuffs.
Ensure containers are adequately labelled, protected from physical damage and sealed when not in use.
Check regularly for leaks or spills.

Transport: : Not regulated for transport purposes.

SECTION 8: Exposure controls / personal protection

8.1. Control parameters

Occupational Exposure Limit: : ***(*ACGIH, edition 2008)**

TLV-TWA: : 10mg/m^3 (inhalable particles)
3mg/m^3 (respirable particles) based on "particulates not otherwise classified"

8.2. Exposure controls

Respiratory protection: : Use an appropriate and approved respirator for toxic dust or fume if airborne concentration is likely to exceed the occupational exposure limits.

Hand protection: : Wear suitable gloves (PVC or rubber).

Eye protection: : Wear dust-proof goggles.

Skin protection: : Safety shoes, overalls or similar full-body work clothes should be worn and laundered daily.
This protective clothing should not be worn at home.

Personal Hygiene: : Practice good housekeeping and personal hygiene procedures.
No eating, drinking or smoking in work areas.
Wash hands thoroughly before eating, drinking or smoking.
Avoid ingestion, inhalation and skin and eye contact.
Medical examinations, monitoring, record keeping and hygiene facilities are recommended.

Exposure Controls: : 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 standard.

SECTION 9: Physical and chemical properties

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

9.1. Information on basic physical and chemical properties

Appearance	:	Pale grey metallic lumps
Odour	:	Odourless
Boiling point	:	2963°C
Melting point	:	1555°C

Flammability (solid, gas)	:	Non flammable
Lower Explosion Limit	:	Not relevant
Upper Explosion Limit	:	Not relevant
Flash point	:	Not relevant
Auto-ignition temperature	:	Not relevant
Evaporation Rate	:	Not relevant
pH	:	Not relevant
% Volatiles	:	Not relevant
Specific Gravity	:	12.02
Vapour pressure	:	Not relevant
Relative density	:	2.9-3.6 (variable) g/cm^3
Solubility in water	:	Insoluble
Molecular weight	:	106.42g/mole
Pd concentration	:	≥99.95%

SECTION 10: Stability and reactivity

10.1. Reactivity

The material is stable under normal circumstances. Avoid conditions which create dust or fumes. Materials to avoid are oxidizing agents, strong acids, halogens and bases. Palladium undergoes a violent reaction with arsenic, methanol, ethanol, and alcohols.

10.2. Flammability

Non-flammable. May evolve toxic metal oxides when heated. Very fine dust may explode in very high concentrations if exposed to high energy heat or ignition sources (highly unlikely in current form). May evolve flammable – explosive hydrogen gas in contact with strong acids.

10.3. Decomposition Products

Exposure to high temperatures (>1000°C), generation of dust. Will evolve toxic metal oxides when heated to decomposition.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity – Palladium powder is non-toxic

Result	Species	Dose	Exposure
May cause irritation of the gastro-intestinal tract			

Acute toxicity – Palladium salts may be more toxic

Result	Species	Dose	Exposure
Palladium Chloride LD50 Oral	Rat	2704mg/kg	-
LD50	Rat	170mg/kg	

Irritation / Corrosion

Product / Ingredient name	Result	Species	Score	Exposure	Observation
Palladium Metal is relatively inert Low irritant	Prolonged and repeated exposure to dust/powder may result in irritation due to mechanical action	-	-	-	-

Conclusion / Summary

Serious Eye damage / Irritation : Eye irritation, lachrymation, pain, redness, conjunctivitis and possible corneal burn with prolonged contact.

Skin : **Palladium metal** is unlikely to cause irritation except as a dust.
Palladium salts are irritating to eyes, skin and mucous membranes and may cause sensitization.

Eyes : Causes serious eye damage.

Respiratory : Not classified.

Germ Cell Mutagenicity

The effects of Palladium salts have not been fully investigated.

Carcinogenicity

Palladium Salts:

Non-Carcinogenic: : Are listed as a non-carcinogenic in (all U.S)
: (i) in the National Toxicity Program (NTP) Report on Carcinogens.
: (ii) in the International Agency for Research on Cancer (IARC) monographs.
: (iii) by the Occupational Safety and Health Administration (OSHA).

Palladium chloride: : Has caused tumours in some animal studies.

Reproductive Toxicity

Palladium Salts: : Animal experiments indicate that exposure to Palladium salts may result in production of abnormal foetuses.
: Pregnant women should avoid therefore contact.

Effect: : Not fully investigated.

Specific Target Organ System Toxicity Single Exposure

Palladium Salt: : Caused bone marrow, liver and kidney damage in experimental animals.
: Interfere with the use of energy in nerves and muscles and induce lung malfunctions.

Effect: : Not fully investigated.

Specific Target Organ System Toxicity Repeated Exposure

Palladium Salt: : Caused bone marrow, liver and kidney damage in experimental animal.
: Interfere with the use of energy in nerves and muscles and induce lung malfunctions.

Effect: : Not fully investigated.

Aspiration Hazard

Inhalation: : Low irritant.
: Inhalation of dust may result in upper respiratory tract irritation.

Palladium Metal: : Low Hazard.

Palladium Salts: : Potential irritants and sensitisers.

SECTION 12: Ecological information

12.1 Toxicity

Palladium Powder: : Insoluble in water, there is low potential to aquatic life.
: Does not directly pose any ecological threat.

12.2 Persistence and degradability

Palladium Salts:
Conclusion / summary : Hazard of platinum persistency in the environment.

12.3 Bioaccumulate potential

Palladium Salts: : Hazard of palladium accumulation.

12.4 Biomagnification

Palladium Salts: : Potential hazard of palladium magnification.

12.5 Biodegradability

Palladium Salts: : No information available.

12.6 Ecotoxicity

Aquatic organisms

Result	Species	Dose	Exposure
LC50	Fish	7 mg/l	24 hours
LC50	Worm	0.24mg/l	24 hours
EC50	Algae	0.02mg/l	72 hours
EC50	Algae	0.03mg/l	24 hours

Soil organisms: : Unknown
Plants and terrestrial animals: : Unknown, no data available

12.7 Other adverse effects

Ozone depletion potential: : Does not contain ozone depleting substances
Photochemical ozone creation potential: Not applicable
Global warming potential: : Not applicable
Effects on waste water treatment plants: Unknown, no data available
The environmental effects of Palladium and its compound have not been fully evaluated.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product Methods of disposal: : Disposer must comply with state and local laws.
: The material can be metallurgically recycled by Impala Platinum, South Africa which is a pre-authorized facility for the environmentally sound recovery of metals.
Collect and re-use where possible.
: Minimise dust generation.
: Contact Impala Refineries Laboratory Manager on +27 11 360 3255 or Palladium Section Manager on +27 11 360 3172

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

SECTION 14: Transport information

14.1. Not classified as a dangerous good
Not regulated for Transport purposes

Packing:	:	In plastic bags sealed in tins which in turn are sealed in boxes.
UN-Number:	:	Not applicable.
IMDG-Code:	:	Not applicable.
ICAO / IATA:	:	Not applicable.
RID / ADR:	:	Not applicable.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

United States:	:	CERCLA Sections 102a/103 (40 CFR 302.4)
	:	Not regulated.
Canada:	:	WHMIS Classification.
	:	D2B (Toxic material).
EU/EC Classification	:	XN (Harmful).
	:	Not classified in Annex I of Directive 67/548/EEC.
	:	(will change with implementation of GHS/REACH).

Regulation (EC) No. 1907/2006 pf the European Parliament and the Council of December 2006.

SECTION 16: Other information

Abbreviations and acronyms :

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 Nº	:	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.
RTECHS	:	The Registry of Toxic Effects of Chemical Substances.
ICSC	:	International Chemical Safety Card.
EC No	:	European Commission Number.
EU	:	European Union
AUS	:	Australia

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.

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 to clearly identify how users can control the hazards and thereby reduce the risk (or likelihood) of adverse effects.

Guideline:

Colour	Type of Hazard
Green	Low
Amber	Moderate
Red	High

Whist 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.

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 3255 or +27 11 360 3172.

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 risk and apply control methods where appropriate.

The buyer assumes all risks with the use and handling of the material. The seller assumes no responsibility for injury or damage caused by use of the material even if reasonable safety procedures are followed. The information contained in this sheet is developed from what is believed to be accurate and reliable sources, but the seller makes no warranties, either expressed or implied, and assumes no responsibility for the accuracy or completeness of the data contained herein.

Hazard Information References:

RTECS:

: Registry of toxic effects of Chemical Substances, NIOSH, edition January 1999
: Sax's Dangerous Properties of Industrial Materials (8th edition), R J Lewis Sr.
: Material Safety Data Sheet: Platinum Standard Solution National Institute of Standards and Technology (USA) August 2006.
: Screening of Platinum Group Metals; Pt, Rh, Pd SWECO VIAK Screening Report 2007:2 (For Swedish Environmental Protection Agency)
: ECOTOX database; http://cfpub.epa.gov/ecotox
: ENVIRONMENTAL HEALTH CRITERIA 226
: Palladium WHO;
https://www.inchem.org/documents/ehc/ehc/ehc226.htm.htm

Report Status:

Impala Platinum Ltd. Have exercised reasonable are in the preparation 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. Sinc 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.