



Accredited Africa Training Institute for Capacity Development

Unit FO409, Hatfield Plaza · 1122 Burnett St, Hatfield 0028 · Pretoria, Gauteng · South Africa

Tel: +27 12 004 8389 · Mobile: +27 65 077 6310

Email: apply@aaticd.co.za · Website: www.aaticd.co.za

COURSE BROCHURE

Platinum Group Metals Sponge Production Process Control Training

Manufacturing, Engineering and Technology / Fabrication and Extraction

Unit Standard 110374 · NQF Level 4 · 22 Credits · 19 Days

COURSE OVERVIEW

This course equips learners with the knowledge and skills to control the production process for platinum group metals (PGMs) sponge, ensuring consistent quality, safety, and efficiency. Participants will gain the ability to monitor and adjust process parameters, interpret production data, and apply corrective actions in compliance with industry standards.

Category	Manufacturing, Engineering and Technology
Subfield	Fabrication and Extraction
Unit Standard	110374
Accreditation	SAQA Accredited · NQF Level 4 · 22 Credits
Duration	19 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Apply process control principles to monitor and adjust PGM sponge production parameters.
- Analyze production data to identify deviations and implement corrective actions.
- Evaluate process efficiency and product quality against specified standards.
- Implement safety and environmental procedures relevant to PGM sponge production.
- Demonstrate effective communication and reporting within the production team.
- Design process improvements to optimize yield and reduce waste.

WHO SHOULD ATTEND

- This training is designed for process controllers, production supervisors, and metallurgical technicians working in PGM refineries or smelters who are responsible for sponge production operations.

COURSE OUTLINE

Day 1: Introduction to PGM Sponge Production and Process Control

- Overview of platinum group metals and their applications
- PGM refining process: from ore to sponge
- Introduction to unit processes in sponge production
- Basic principles of process control
- Safety and environmental considerations

Day 2: Raw Materials and Feedstock Preparation

- Sources of PGMs: primary ores, recyclates, intermediates
- Feedstock characterization: assay, moisture, particle size
- Blending strategies for consistent feed
- Sampling protocols and sample preparation
- Quality control of incoming materials

Day 3: Leaching – Process Fundamentals

- Chemistry of PGM dissolution
- Types of leaching: atmospheric, pressure, oxidative
- Key parameters: pH, temperature, redox potential, residence time
- Reagents: acids, oxidants, complexing agents
- Leaching kinetics and mass transfer

Day 4: Leaching – Process Control and Optimization

- Control strategies: feed-forward, feedback, cascade
- Instrumentation: pH, ORP, flow, temperature sensors
- Reagent dosing control
- Data logging and trend analysis
- Yield optimization and troubleshooting

Day 5: Solution Purification – Precipitation and Solvent Extraction

- Impurities in leach solutions: base metals, non-metals
- Selective precipitation: pH control, sulfide precipitation
- Solvent extraction: extractants, stripping, phase separation
- Ion exchange as an alternative
- Process control parameters: flow ratios, pH, temperature

Day 6: PGM Recovery – Precipitation of Platinum and Palladium

- Precipitation of platinum as ammonium hexachloroplatinate
- Precipitation of palladium as diammine dichloride
- Key variables: concentration, temperature, reductants
- Filtration and washing
- Yield and purity trade-offs

Day 7: PGM Recovery – Rhodium, Iridium, Ruthenium, Osmium

- Rhodium recovery: precipitation, ion exchange
- Iridium recovery: oxidation state control
- Ruthenium and osmium: oxidative distillation
- Process control for distillation columns

- Safety considerations for toxic compounds

Day 8: Calcination and Sponge Formation

- Thermal decomposition of PGM salts
- Calcination furnaces: rotary, static, belt
- Parameters: temperature profile, atmosphere, residence time
- Sponge properties: specific surface area, bulk density
- Quality control tests: XRD, BET, Leco

Day 9: Process Control Systems and Instrumentation

- Distributed control systems (DCS) vs PLC/SCADA
- Sensors: temperature, pressure, flow, level, pH, ORP
- Control loop components: transmitter, controller, final element
- P&ID; symbols and process control narratives
- Alarm management and interlock systems

Day 10: Statistical Process Control (SPC) in PGM Production

- Introduction to SPC: variation, common vs special causes
- Control charts: X-bar, R, individual/moving range
- Process capability: Cp, Cpk
- Sampling strategies for SPC
- Corrective actions based on SPC signals

Day 11: Quality Assurance and Product Testing

- Quality management principles
- Sampling techniques for bulk solids
- Analytical methods: ICP, XRF, fire assay
- Product specifications: purity, particle size, impurities
- Non-conformance handling and root cause analysis

Day 12: Process Safety and Hazard Management

- Process hazards: chemical, thermal, pressure
- HAZOP methodology
- Layers of protection analysis (LOPA)
- Safe handling of acids, oxidizers, toxic gases
- Emergency response and spill containment

Day 13: Environmental Management and Waste Treatment

- Environmental legislation: NEMA, water use licenses
- Effluent treatment: neutralization, metal recovery
- Air emissions: scrubbers, filters
- Solid waste management: tailings, sludges
- Water recycling and zero liquid discharge

Day 14: Advanced Process Control – Model Predictive Control

- MPC fundamentals: prediction, optimization, receding horizon
- MPC vs PID control
- Applications: leaching, precipitation, calcination
- Implementation considerations
- Performance monitoring and tuning

Day 15: Automation and Digitalization in PGM Plants

- Automation pyramid: field level to enterprise
- Digital twins: modeling and simulation
- Data analytics: dashboards, trend analysis
- Machine learning for predictive maintenance
- Cybersecurity in industrial control systems

Day 16: Process Economics and Production Planning

- Cost components: raw materials, energy, labor
- Yield calculations and mass balances
- Production scheduling: campaigns, bottlenecks
- Lean tools: 5S, Kaizen, value stream mapping
- Metal accounting: inventory, reconciliation

Day 17: Troubleshooting and Root Cause Analysis

- Problem-solving methodologies: DMAIC, PDCA
- Root cause analysis tools
- Case studies: low yield, off-spec product, equipment failure
- Systematic approach: data collection, hypothesis testing
- Documentation and change management

Day 18: Integration and Case Studies

- Integrated process control scenarios
- Case study 1: feed variability and its impact
- Case study 2: impurity excursion and recovery
- Case study 3: calcination temperature upset
- Group presentations and peer review

Day 19: Assessment and Course Review

- Written assessment (knowledge)
- Practical assessment (simulation or plant)
- Review of unit standard outcomes
- Questions and answers
- Course evaluation and certification

ASSESSMENT & CERTIFICATION

Delegates are assessed through exercises and a final test. A mark of **50% or above** earns an **AATICD Certificate of Completion**, issued digitally with a unique verification code. This course carries **22 NQF credits** at **NQF Level 4**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 58,900.00	R 58,900.00
1	In-House	R 76,600.00	R 76,600.00
1	On-Campus (Pretoria)	R 88,400.00	R 88,400.00

UPCOMING SESSIONS

Start	End	Method	Venue
31 Jul 2026	26 Aug 2026	On-Campus	Dar es Salaam, Tanzania
03 Aug 2026	27 Aug 2026	On-Campus	Johannesburg, South Africa
04 Aug 2026	28 Aug 2026	On-Campus	Mauritius
05 Aug 2026	31 Aug 2026	On-Campus	Cape Town, South Africa
06 Aug 2026	01 Sep 2026	On-Campus	Dubai, UAE
07 Aug 2026	02 Sep 2026	On-Campus	Pretoria, South Africa
07 Aug 2026	02 Sep 2026	On-Campus	Lagos, Nigeria
10 Aug 2026	03 Sep 2026	On-Campus	Mauritius

Contact us if no suitable date is listed – on-demand sessions can be arranged for groups.

HOW TO GET A QUOTE OR APPLY

- 1. Get an instant quotation online:** visit www.aaticd.co.za, open the page for this course (Unit Standard 110374) and click **Get A Quote / Apply**. Select your training method and number of delegates – your quotation is generated immediately and emailed to you with the course brochure attached.
- 2. Apply by email:** send the course title, your preferred training method (Online, In-House or On-Campus Pretoria), the number of delegates and your preferred dates to apply@aaticd.co.za – our team will reply with a formal quotation.
- 3. Apply by phone or WhatsApp:** call +27 12 004 8389 or WhatsApp +27 65 077 6310 and we will prepare your quotation and reserve your seats.
- 4. Confirm your booking:** accept the quotation and settle the invoice. As soon as payment is confirmed your delegates are enrolled and receive their AATICD LMS login details by email, along with joining instructions for their chosen training method.

Group discounts apply automatically – the more delegates you enrol, the lower the price per delegate. No payment is required to request a quotation.

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