



## 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](mailto:apply@aaticd.co.za) · Website: [www.aaticd.co.za](http://www.aaticd.co.za)

### COURSE BROCHURE

# Vertical Converter Slag Magnetite Content Control Training

Manufacturing, Engineering and Technology / Fabrication and Extraction

Unit Standard 110120 · NQF Level 3 · 7 Credits · 4 Days

## COURSE OVERVIEW

This course equips learners with the knowledge and skills to control magnetite content in vertical converter slag during steelmaking. It focuses on monitoring, adjusting, and optimizing slag chemistry to improve process efficiency, reduce waste, and ensure compliance with safety and environmental standards.

|                 |                                           |
|-----------------|-------------------------------------------|
| Category        | Manufacturing, Engineering and Technology |
| Subfield        | Fabrication and Extraction                |
| Unit Standard   | 110120                                    |
| Accreditation   | SAQA Accredited · NQF Level 3 · 7 Credits |
| Duration        | 4 days                                    |
| Training Method | Online, On-Campus, In-House               |
| Certificate     | Issued via AATICD LMS – verifiable online |

## LEARNING OUTCOMES

- Apply principles of slag chemistry to monitor magnetite content in vertical converter operations.
- Analyze slag samples using standard testing methods to determine magnetite levels.
- Evaluate process variables affecting magnetite formation and implement corrective actions.
- Implement control measures to maintain magnetite content within specified limits.
- Demonstrate adherence to safety protocols during slag handling and sampling procedures.
- Document and report magnetite content data for process optimization and compliance.

## WHO SHOULD ATTEND

- Process controllers, metallurgical technicians, and production supervisors working in steel manufacturing or smelting operations who are responsible for slag management and quality control.

## COURSE OUTLINE

### Day 1: Fundamentals of Slag Magnetite and Converter Operations

- Introduction to converter slag: composition, functions, and importance.
- Magnetite ( $\text{Fe}_3\text{O}_4$ ) in slag: sources, formation mechanisms, and effects.
- Overview of converter process stages and slag generation.
- Factors affecting magnetite content: oxygen potential, temperature, and slag basicity.
- Basic slag sampling techniques and safety considerations.
- Visual assessment of slag: colour, texture, and magnetite indicators.
- Introduction to slag handling and environmental considerations.

### Day 2: Measurement and Analysis of Magnetite Content

- Laboratory analysis techniques: XRF, XRD, and chemical titration for magnetite.
- Calibration and use of handheld magnetite meters and magnetic susceptibility devices.
- Sampling protocols: representative sampling, sample preparation, and chain of custody.
- Data interpretation: correlating magnetite content with slag viscosity and foaming.
- Quality control: duplicate samples, blank tests, and proficiency testing.
- Troubleshooting measurement discrepancies and instrument maintenance.
- Case study: analysing slag samples from different converter heats.

### Day 3: Control Strategies for Magnetite Content Optimisation

- Process control parameters: oxygen flow rate, lance height, and blowing time.
- Flux management: types of fluxes (lime, dolomite, fluorspar) and their effect on magnetite.
- Slag conditioning: use of carbonaceous materials and reductants.
- Real-time monitoring: temperature, slag splashing, and slag foaming indicators.
- Optimising slag basicity and  $\text{FeO}$  content for magnetite control.
- Impact of magnetite on refractory wear and slag carryover.
- Practical exercises: adjusting process parameters in a simulated environment.
- Standard operating procedures for magnetite content control.

### Day 4: Advanced Applications and Process Integration

- Advanced data analytics: trend analysis, statistical process control (SPC) for magnetite.
- Integration with downstream processes: ladle treatment and continuous casting.
- Environmental and safety aspects: slag disposal, dust control, and spill prevention.
- Troubleshooting common problems: high magnetite, slag foaming, and refractory wear.
- Continuous improvement: Kaizen, root cause analysis, and corrective action plans.
- Assessment: practical demonstration of sampling, measurement, and control techniques.
- Review of key learnings and final Q&A session.
- 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 **7 NQF credits** at **NQF Level 3**.

## PRICING (PER DELEGATE, EX-VAT)

| Delegates | Training Method      | Price per Delegate | Total       |
|-----------|----------------------|--------------------|-------------|
| 1         | Online               | R 20,500.00        | R 20,500.00 |
| 1         | In-House             | R 26,600.00        | R 26,600.00 |
| 1         | On-Campus (Pretoria) | R 30,800.00        | R 30,800.00 |

## UPCOMING SESSIONS

| Start       | End         | Method    | Venue                      |
|-------------|-------------|-----------|----------------------------|
| 03 Aug 2026 | 06 Aug 2026 | On-Campus | Pretoria, South Africa     |
| 03 Aug 2026 | 06 Aug 2026 | On-Campus | Cape Town, South Africa    |
| 03 Aug 2026 | 06 Aug 2026 | On-Campus | Johannesburg, South Africa |
| 04 Aug 2026 | 07 Aug 2026 | On-Campus | Dubai, UAE                 |
| 04 Aug 2026 | 07 Aug 2026 | On-Campus | Mauritius                  |
| 04 Aug 2026 | 07 Aug 2026 | On-Campus | Lagos, Nigeria             |
| 10 Aug 2026 | 13 Aug 2026 | On-Campus | Mauritius                  |
| 10 Aug 2026 | 13 Aug 2026 | On-Campus | Dubai, UAE                 |

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](http://www.aaticd.co.za), open the page for this course (Unit Standard 110120) 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](mailto: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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