



MINING AND MINERALS TRAINING

Smelting and Pyrometallurgical Operations

5 day course

Classroom, online or in-house

Course overview

A smelter converts energy and reductant into metal and slag, and the difference between a good and a bad operation is usually control of the slag rather than anything done to the metal. This course concentrates there. Delegates work through the thermodynamic basis in practical terms: oxidation states, reduction and the conditions under which a metal reports to matte, metal or slag. Furnace types are covered across submerged arc, blast, flash and converter operations, with the duties each suits. Feed preparation, blending and moisture control follow. Slag chemistry is addressed in detail, including basicity, viscosity, liquidus and the tapping behaviour each produces. Refractory wear and furnace integrity are covered, since a run out is the worst outcome available. Tapping, casting and handling of molten material are addressed with their specific hazards. Off gas, dust and sulphur capture follow. Energy consumption per tonne is treated as the central economic measure. The course closes on recovery accounting and on furnace shutdown and relining.

What you will learn

- Explain in practical terms where a metal reports under given conditions
- Match furnace type to duty across arc, blast, flash and converter routes
- Prepare, blend and control moisture in feed
- Control slag basicity, viscosity and tapping behaviour
- Monitor refractory wear and protect furnace integrity
- Tap, cast and handle molten material safely
- Capture off gas and sulphur, and control energy per tonne

Who should attend

- Smelter operators and furnace controllers
- Pyrometallurgists and process engineers
- Production supervisors at smelters and refineries
- Maintenance staff on furnace assets
- Safety staff responsible for molten material areas

Course outline

- 01 Control the slag, not the metal
- 02 Practical thermodynamics of reduction
- 03 Submerged arc, blast, flash and converters
- 04 Feed preparation and blending
- 05 Slag basicity, viscosity and liquidus
- 06 Refractory wear and run out risk
- 07 Tapping, casting and molten material hazards
- 08 Off gas capture, energy per tonne and relining

Upcoming dates



Dates	Venue	Format	Fee per delegate
21 to 25 September 2026	Lagos, Nigeria	Classroom	USD 1,325
16 to 20 November 2026	Kigali, Rwanda	Classroom	USD 1,325
7 to 11 December 2026	Windhoek, Namibia	Classroom	R19,950
21 to 25 December 2026	Online	Online	R8,500

Fees and how to register

This 5 day course is **R8,500** per delegate online, **R19,950** in the classroom in South Africa, Botswana, Namibia, Lesotho and Eswatini, and **USD 1,325** in the classroom elsewhere in Africa. In-house training is quotation on request. Book 2 or more delegates on this course and save 10%.

To register or request an in-house proposal, visit www.afrisciencegroup.com, email info@afriScience.co.za, or WhatsApp us on **+27 63 479 1136**.

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