SAIMM PYROMETALLURGY
INTERNATIONAL CONFERENCE 2026
Foundations of Competitiveness and Sustainability

25 MAY 2026
TIME: 08:30-16:30
CSIR INTERNATIONAL CONVENTION CENTRE, PRETORIA, SOUTH AFRICA

Registration Fees:
Member: R4 200
Non-member:5 000
Student:850

ECSA and SACNASP Validated CPD Activity Credits = 0.1 per hour attended

SAIMM
THE SOUTHERN AFRICAN INSTITUTE OF MINING AND METALLURGY

WORKSHOP

Advanced Refractory Materials and their role in Furnace Integrity/Furnace Containment

BACKGROUND

Advanced refractory materials form the primary defence system in high intensity pyrometallurgical furnaces, where they must maintain structural integrity under severe thermal gradients, corrosive slags, high mechanical loads, and fluctuating process conditions. Modern refractory oxide systems—such as alumina, magnesia, chromia, and their complex spinel or carbon bonded variants—are engineered to deliver optimised thermochemical stability, controlled thermal conductivity, and predictable wear behaviour across different smelting environments. Their performance directly influences furnace campaign life, tapping efficiency, energy consumption, and overall operational reliability. Tailored refractory solutions for critical zones—particularly tapholes, hearths, sidewalls, and tapping channels—require precise material selection, robust quality control, and continuous monitoring to mitigate wear mechanisms such as chemical dissolution, thermal shock, and mechanical erosion. As furnace technologies evolve toward higher throughput and more aggressive slag chemistries, the role of advanced refractories becomes increasingly strategic in ensuring safe containment, minimising downtime, and enabling consistent metallurgical performance.

TOPICS

Refractory materials

- Classification of refractory oxide systems for various smelting operations
- Performance benefits and challenges of refractory oxide systems

Tap hole refractory materials – taphole clay

- Classification of clay for various smelting operations
- Binders for taphole clays
- Testing of taphole clays
  - Product development
  - Quality control
- Taphole processes – process monitoring for optimal furnace efficiency

Refractory Installation

- Maintenance installation of tapping channel and surrounding tapping area refractories

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FOR FURTHER INFORMATION, CONTACT:
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ABOUT THE FACILITATORS

Andrie Garbers-Craig

Andrie holds an SM (Metallurgy) from the Massachusetts Institute of Technology (MIT) and a PhD (Metallurgy) from the University of Pretoria. She began her career at Mintek, South Africa, where she was involved in both fundamental and applied pyrometallurgical research. In 1995, she joined the R&D division of Iscor (Iron and Steel Corporation of South Africa) before transitioning to academia in 1999. She is currently a full professor in the Department of Materials Science and Metallurgical Engineering at the University of Pretoria, where her research focuses on pyrometallurgical processes and refractory materials. She holds the Valterra Platinum Chair in Pyrometallurgy.

Izak Cameron

Izak Cameron is a Research and Development Scientist at Elkem ASA, focusing on refractory solutions for pyrometallurgical processes. He earned his PhD in Metallurgical Engineering from the University of Pretoria, specializing in taphole clay behavior and binder systems. With extensive experience in refractory product development and process optimization, Izak drives innovation through microsilica-based technologies and sustainable high-temperature solutions. He is passionate about knowledge transfer and translating research into practical applications that enhance performance and efficiency in the metals industry.

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