

# Third School on Manganese Ferroalloy Production – Chairman's report

The Third School on the Production of Manganese Ferroalloys was planned as an in-person event hosted by the SAIMM at the Sishen Country Club in Kathu in the Northern Cape Province. The event was scheduled for 24 and 25 June 2020.

Then COVID-19 struck. On 15 March 2020, President Cyril Ramaphosa declared a national state of disaster, prohibiting gatherings of more than 100 people. On 26 March the country went into a 21-day national lockdown, which was subsequently extended a number of times, with severe restrictions on people's mobility.

The SAIMM responded to the nationwide lockdown by introducing short, Zoom-based webinars as a platform for dissemination of information in lieu of in-person events. After a successful webinar presentation entitled 'The PreMa Project Within the Context of Manganese Ferroalloy Production in South Africa', presented by Eli Ringdalen of SINTEF in Norway and me on 23 April, it was decided to convert the Third School on Manganese Ferroalloy Production into a series of webinars. The event was hosted over 5 days from 24 to 28 August.

The School, which followed on the first and second manganese ferroalloy schools hosted in South Africa in 2012 and 2016 respectively, was hosted in partnership with the PreMa project. The PreMa project is funded by the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 820561, and European (Eramet, Ferroglobe, OFZ, and Outotec) and South African (Transalloys) industrial partners. The seed for the PreMa project was planted during the workshop associated with the Second School on Manganese Ferroalloy Production in 2016.

The main topics covered during the webinars were:

1. Commercial production processes, including overviews of manganese production in South Africa and in Europe as well as introductions to potential new projects.
2. Process fundamentals, including fundamental thermodynamics, slag fundamentals, and reaction kinetics
3. Operational aspects, including raw materials, prereluction zone, coke bed zone, lining concepts, energy consumption, electrical current paths and resistance in furnace, and environmental considerations.

In total, 14 presenters participated in the event. The webinars consisted of 18 hours of contact time in total, of which 11 hours included some material from the PreMa project, presented by nine active members of the PreMa consortium. The sessions were facilitated by Dr Ringdalen and me.

As the methodology followed was unfamiliar, I will describe it in more detail. The first two days consisted of three individual presentations scheduled every hour from 09:00 to 12:00 South African time. The third day included a fourth presentation and was therefore scheduled from 09:00 to 13:00. On each day the facilitator introduced the presenter by reading his/her short biography at the beginning of each presentation. The presenter gave a talk of about 15–45 minutes (25–30 minutes was proposed). The webinar version of Zoom included a question and answer (Q&A) tool where delegates could type in their questions. After the presentation, the facilitator would read the question and allow the presenter to answer orally until 50 minutes into the hour. Delegates then took a 10-minute break before the next presentation started. If any questions remained, the presenter answered them in writing using the Q&A tool.

Aloys d'Harambure of the International Manganese Institute in France gave the market perspective on manganese ferroalloy production. The geology and mining of the Kalahari and Comilog orebodies in South Africa and Gabon were presented by Desh Chetty of Mintek (South Africa) and Simon Blancher of Eramet Ideas (France). Overviews of manganese ferroalloy production in South Africa and Slovakia were presented by Kobus Sutherland of Transalloys and Musa Cele of Assmang in South Africa and Denys Gryshan of OFZ in Slovakia. Lina Hockaday of Mintek discussed the sintering of manganese ores, and Noémie Julia of Eramet the preheating of manganese in a pilot-scale rotary kiln. Working at Mintek, I discussed the furnace containment philosophies in manganese ferroalloy production. Hanlie Kotzé of Consensi in South Africa discussed mineral wool production from waste silicomanganese slags.

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The fourth and fifth days consisted of two workshops, each with two presenters. Merete Tangstad and Eli Ringdalen introduced the PreMa project and discussed the fundamentals of producing manganese ferroalloys using submerged arc furnace smelting technology. On the final day, Markus Reuter and Timur Kazdal utilized high-carbon ferromanganese production as a case study to illustrate the use of simulation-based mass and energy balance, exergy calculations, and life cycle analysis footprinting of systems.

On these days, the facilitator introduced both presenters by reading their short biographies, after which the presenters determined the schedule of break intervals (10 minutes each) and the rhythm at which questions were addressed.

Presenters were asked for copies of their slides, which were distributed to delegates via e-mail by the SAIMM after permission was granted by presenters. Presentations were also recorded and will be distributed to delegates once the recordings have been processed.

In total, 90 people registered to attend the webinars. The majority of delegates were from South Africa (63%), with Norway representing 18%, France and Germany both 6%, China 3%, Brazil 2%, and the UK and Slovakia 1% each. The majority of delegates were from research institutions (66%), 16% were from operations, 7% from engineering companies, and 12% from other companies or self-employed. Research institutions were based in South Africa (3), Norway (2), France (1), Germany (1), and China (1) and included universities from Norway (1), Germany (1), South Africa (2), and China (1). Operations were based in South Africa (3, including two smelters and one mine), Brazil (1), China (1), Norway (1), and Slovakia (1). Engineering houses were European (2) or South African with European ties (1). Mintek registered the most delegates (42%). Mintek is training a significant number of interns on behalf of the Mining Qualifications Authority and the National Research Foundation, and these interns were all offered the opportunity to register for the event for free. After their internships, the interns will typically be employed in the South African mining and metallurgical industry, with the result that the knowledge they gain will be further disseminated into the community.

Converting the School from its conventional in-person format to an on-line event turned out to be a useful experience. While the webinar format lacked opportunities for personal interaction between presenters and audience and for networking, it did offer opportunities for the dissemination of information during a time when international travel was prohibited. The SAIMM and PreMa project were probably able to attract more delegates from a wider range of countries and a diverse group of companies than would have been possible with an in-person event. Lastly, the format enabled a repository of recorded presentations to be available after the event. A future event will probably be a hybrid version, where an in-person event is combined with a webinar series should travel restrictions be lifted.

In conclusion, the organizing committee would like to thank METIX, which sponsored the Third School on Manganese Ferroalloy Production. The SAIMM looks forward to hosting the Fourth School on Manganese Ferroalloy Production in 2022, again in collaboration with the PreMa project.

### References

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