



International Steel Academy Review

Fundamental Principles — Practical Knowledge

- > **Steelmaking** (MSTS 201)
- > **Steel Shaping & Treating** (MSTS 202)
- > **Advanced Aspects of AHSS Production** (MSTS 410)

Event Sponsor

TATA STEEL



Attendees of the MSTS 201: Steelmaking course.

The fifth rendition of the AIST International Steel Academy (ISA) Making, Shaping and Treating of Steel® was held 4–7 December 2017 at the Shavak Nanavati Technical Institute, Tata Steel Ltd., Jamshedpur, India. Three courses were offered as part of the ISA program — MSTS 201: Steelmaking, MSTS 202: Steel Shaping and Treating, and for the first time ever, MSTS 410: Advanced Aspects of AHSS Production. Tata Steel Ltd. was the event sponsor for the program and sent a large contingent to each course. A total of 132 delegates attended, including those from CORE Court Global Network, Essar Steel India Ltd, Hospet Steels Ltd., National Mineral Development Corp. (NMDC), JSW Steel Ltd., Rashtriya Ispat Nigam Ltd. (RINL), M.N. Dastur & Co. and MECON.

The AIST ISA was designed to provide in-depth training focused on the fundamentals and practical aspects of steel manufacturing. The unique curriculum is taught by renowned industry experts and provides efficient and affordable access to world-class steel education. The 200-level courses bring together decades of internationally recognized efforts acquired in industry and academia, reflecting the vitality and global nature of steel manufacturing innovation. Held concurrently over four and a half days, the individual courses are subdivided into the major elements required

to produce quality steel products in today's economy. To provide more advanced education, the MSTS 410 course was offered, which focused on the strength of steel products, more specifically modern high- and ultrahigh-strength steel grades, to provide a clearer understanding of the theory and fundamental aspects of various strengthening mechanisms used in steel products and translate those fundamentals into useful engineering information.

The event opened on 4 December 2017 with an inauguration ceremony. Dr. Siddhartha Misra, head of technology, Steelmaking & Casting, Tata Steel Ltd., welcomed and encouraged attendees to celebrate this occasion for learning and sharing. AIST's executive director, Ronald Ashburn, provided an overview of AIST and explained the importance of building strong networks and continuing education. Chief Guest, Mr. Uttam Singh, vice president ironmaking designate, Tata Steel Ltd., stressed the importance for attendees to make the most of the experience provided. He closed stating AIST has offered a great opportunity for attendees to engage with faculty from other regions of the world, which can open minds and offer ideas and different ways to teach.



Attendees of the MSTS 202: Steel Shaping and Treating course.



Attendees of the MSTS 410: Advanced Aspects of AHSS Production course.



The instructors for the three ISA courses were Dr. Dirk Vandersheuren, Dr.-Ing. Jürgen Cappel and Dr. Emmanuel De Moor.



MSTS 201: Steelmaking was taught by Dr.-Ing. Jürgen Cappel. While many courses focus on steel as a material, the MSTS 201 curriculum broadens the scope to include the ancillary, supporting technologies critical to steelmaking, such as environmental aspects, equipment technology, production scheduling and control systems. The course begins with the history of iron- and steelmaking from the earliest smelters of wrought iron to the modern, technological wonders in steelmaking. Today's steel technology has advanced due to a focus on sustainability and environmental awareness. Cappel described the acquisition and beneficiation of the necessary raw materials for iron- and steelmaking and gave detailed descriptions of iron production, with a focus on the utilization of lower-Fe-containing iron ore and steel production. He also described the latest technology used in continuous casting.

MSTS 202: Steel Shaping and Treating was taught by Dr. Dirk Vandersheuren. This course, first and foremost, is an introduction to the processing of steel products for industry professionals. MSTS 202 merges advanced steel metallurgy concepts and principles of state-of-the-art steel processing technologies, focusing on topics that play an essential role in current steel processing and product development. Vandersheuren provided real-life examples and case studies to support the education and to answer queries from the attendees on current issues they face.

MSTS 410: Advanced Aspects of AHSS Production, developed by Dr. Ir. Bruno C. De Cooman, was taught by Dr. Emmanuel De Moor, associate professor, Colorado School of Mines. The course recognized the vast opportunity that exists in exploiting the ability of steel to be alloyed and processed to achieve greater strengths while maintaining its toughness. De Moor began the course by providing a fundamental understanding of lattice strength and the various hardening processes that influence steel at the microcrystalline level. From the fundamental basics, the course expanded into the various steel grades that have begun to achieve the ultrahigh strengths desired by automotive manufacturers to further lightweight vehicles without losing crash resistance. Bake-hardened steels, dual-phase steels, transformation-induced plasticity and twinning-induced plasticity steels, press-hardened steels, and quench and partitioned steels were all reviewed. The course concluded with a practical exercise of selecting a dual-phase steel, determining its properties desired for the application, establishing the steel chemistry needed, and developing the rolling and treating processes necessary to achieve the final properties.



Many opportunities were provided to the attendees throughout the four days of classroom training to ask questions, network and meet new colleagues. To further enhance the value of the training, plant tours of Tata Steel – Jamshedpur were offered.

A valediction ceremony was held on 6 December 2017 to honor the attendees. The ceremony was attended by Mr. Rajiv Bhatnagar (Essar) as Chief Guest and Mr. Anand Sen (Tata Steel) as Guest of Honour. Each delegate was presented with a certificate acknowledging his/her course completion, and various dignitaries expressed their gratitude to Tata Steel, AIST and the instructors for their execution of

the event. The valediction concluded with a traditional Paika tribal war dance of the Jharkhand region.

AIST extends its sincere gratitude to Tata Steel Ltd., Anand Sen, Vinay Mahashabde and Siddhartha Misra for their support as Event Sponsor, providing the event space and catering needs for all attendees. This event would not have been possible without their generous support and tireless efforts to ensure the attendees, instructors and AIST staff had a pleasant experience. AIST would also like to thank the Ministry of Steel, Government of India, Joint Plant Committee for their role as associate sponsor. ◆