



**Materials
Processing
Institute**



Continuous Casting Course

19th to 22nd March 2018

COURSE OVERVIEW

The Continuous Casting Course provides a comprehensive understanding of slab, bloom and billet casting. The course includes both PRACTICAL and THEORETICAL aspects of continuous casting OPERATION. The course combines 2 days of classroom based learning and 2 days of practical activities in the Institute's plant and laboratories.

COURSE ORGANISERS

David Stamp – Over 35 years of working in the steel industry; in both R&D and plant technical roles. Very experienced in both quality control and technical developments on both bloom and slab casters.

David Bruce – Over 45 years of working in the steel industry in both R&D and manufacturing steel/casting plants. Laterly Slab Caster Technical Manager at the Teesside Steelworks, with extensive knowledge and experience in all aspects of continuous casting and production.

WHO SHOULD ATTEND

- > Manufacturing team leaders/supervisors
- > Process & plant engineers
- > Metallurgists, technologists
- > Research & development personnel
- > Equipment & material suppliers - sales and technical support
- > PhD/EngDoc students

CONTENT

THEORY AND OPERATION

- > Continuous caster designs & operations
- > Recent technology developments: slab, bloom and billet
- > Fluid modelling for process improvement
- > Refractories
- > Caster metallurgy
- > Steel cleanliness
- > Casting defects
- > Casting mould powders
- > Thin slab and direct strip casting

PRACTICAL ACTIVITIES

- > 'Live' Cast Demonstration on the Plant Casting Machine
- > Physical Modelling: Design of Tundish and Casting Tube
- > Design of a Casting Machine: Roll Design, Secondary Cooling Waters, Soft Reduction
- > Plant Caster: Design and Operation/ Melt
- > Refractory Test Work
- > Met Lab: Typical Casting Defects and Steel Cleanness Assessments
- > Mould Powder and XRF Lab

LEARNING OUTCOMES

This course provides with an in-depth overview of continuous casting, including typical operational issues and solutions. After the course you will have an understanding of the fundamental science of all the continuous casting processes.

ORGANISATION / REGISTRATION

Materials Processing Institute
Eston Road
Middlesbrough, TS6 6US
United Kingdom
Tel: + 44 (0)1642 382000
email: training@mpiuk.com
Website: www.mpiuk.com/training

COURSE VENUE & FACILITIES

The course will be held at the Materials Processing Institute, Middlesbrough, United Kingdom.

COURSE PRICE

£995.00 + VAT / Subject to availability.
This price includes lunches and refreshments.

Continuous Casting Course

COURSE PROGRAMME

SPEAKERS:

The course will be delivered by very experienced personnel from operational, technical and R&D backgrounds; selected from the Materials Processing Institute, steel producers, suppliers and steelmaking & casting consultancies.

Monday 19th March 2018 - Theory & Operation

- 09:00 Introduction to Course and Facilities
 09:10 **Overview of BOS & Secondary Steelmaking**
 09:40 **Continuous Caster Design & Operation** - tundish, mould and strand
 10:15 Break
 10:30 **Caster Design & Operation** - requirements to produce high value-added products
 12:15 Break
 13:00 **Caster Design & Operation** - recent technological developments, including new slab, bloom and billet casters
 14:00 Break
 14:15 **Fluid Modelling for Process Improvement** – tundish and mould
 15:30 Break
 16:15 **Refractories** - tundish and mould, wear mechanisms, maintenance, steel grade requirements, value in use, new developments
 17:15 Discussion
 17:30 End of Day 1

Tuesday 20th March 2018 - Practical Activities

- 09:00 **Physical Modelling Lab** - design of tundish and casting tube
 10:15 Break
 10:30 **Overview of Pilot Plant** - EAF, Tank Degasser, Caster, Ingot Casting
 11:20 Break
 11:30 **Refractory Lab**
 12:15 Lunch
 13:00 **Plant Caster** - design and operation (tundish, mould, strand), new process and product developments
 16:20 **Mould Powder and XRF Lab** - mineralogy & melting characteristics, X-ray diffraction (Hot XRD) and fluorescence (XRF) equipment
 17:15 Discussion
 17:30 End of Day 2

Wednesday 21st March 2018 - Theory & Operation

- 09:00 **Caster Metallurgy** - solidification structures, phase diagrams, liquidus determination, sulphur prints
 10:10 Break
 10:20 **Steel Cleanness** - basics, tundish (removal of inclusions), casting mould, strand, determination of cleanness
 11:30 Break
 11:40 **Casting Mould Powders** - properties, types, selection criteria, determining performance
 12:15 Lunch
 13:00 **Casting Defects** - surface and internal: slab, bloom and billet - types, causes and solutions
 14:30 Break
 14:45 **Thin Slab and Direct Strip Casting** - pros, cons, costs, energy and grades
 16:15 Discussion
 17:30 End of Day 3

Thursday 22nd March 2018 - Practical Activities

- 09:00 **Met Lab** - billet, bloom, slab, plate and strip defects
 10:15 Break
 10:30 **Met Lab & SEM** - forensic metallurgy; methodology and practical examples
 12:15 Lunch
 13:00 **Plant** - direct strip caster
 14:00 Break
 14:15 **Caster Instrumentation** - current and new measurement method - improving process control including flow, temperature, clogging, defects
 15:15 Break
 16:00 **Caster Instrumentation** - part 2
 16:45 Discussion
 17:15 **Course Review & Feedback**
 17:30 End of Course

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