Materials Processing Institute



# Steelmaking & Continuous Casting Course 8th to 12th June 2020

### **COURSE OVERVIEW**

The Steelmaking & Continuous Casting course provides a comprehensive understanding of primary steelmaking, secondary steelmaking and continuous casting. The presentations combine both **practical** and **theoretical** aspects of steelmaking and casting, including laboratory activities and a tour of the Materials Processing Institute Plant.

#### **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 & technical support
- > Phd / Eng Doc students

#### CONTENT

- > Overview of world steel production
- > BOS Process theory & practice
- > Electric Arc Furnace Steelmaking
- > Clean Steel theory & practice
- > Sampling and Sensors for improved process control
- > Compositional Control theory & practice, misfits
- > Caster Metallurgy
- > Casting of difficult steel grades
- > Operation & design of Casting Machines
- > Casting defects (surface & internal), Scarfing
- > Casting Mould Powders

#### CONTENT

- > Fluid Modelling for process improvement
- > Steelmaking and Casting Refractories
- > Alternative casting technologies
- > Customer perspective

#### LEARNING OUTCOMES

This course provides an in-depth knowledge of both steelmaking and continuous casting, including typical operational issues and solutions. After the course you will have an understanding of the fundamental science of both the steelmaking and 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.

## Steelmaking & Continuous Casting

**Course** INDICATIVE 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 companies, suppliers and steelmaking & casting consultancies.

#### Monday 8th June 2020

12:45	Arrival, reception and refreshments
13:15	Introduction to course and facilities
13:30	World Steel Production - output statistics, challenges, profitable steel companies
14:15	Break
14:30	BOS Process - theory & practice
15:45	Break
16:00	Practical Steelmaking considerations
17:15	Discussion
17:15	End of Day 1

#### Tuesday 9th June 2020

09:00	Electric Arc Furnace - theory & practice
10:10	Break
1010	Electric Arc Furnace & BOS - which is best?
11:20	Break
11:30	Secondary Steelmaking - theory & practice
12:15	Lunch
13:00	Project Activities
15:00	<b>Compositional Control</b> - <i>slag chemistry,</i> <i>low S &amp; low H2, misfits</i>
16:10	Break
16:20	Temperature and Analytical Techniques
17:10	Discussion

17:30 End of Day 2

#### **PROJECT ACTIVITIES**

Delegates will be involved in projects including:

- Physical modelling: tundish and casting tube
- Design of a casting machine (roll design, secondary cooling waters, soft reduction)
- Examination of typical casting defects
- Steel cleanness & inclusion assessments
- Tour of the Materials Processing Institute plant

#### Wednesday 10th June 2020

- 09:00 **Caster Metallurgy** solidification structures, phase diagrams, sulphur prints, forensic metallurgy
- 10:15 Break
- 10:25 Casting of difficult steel grades machine design & condition, effect of steel composition, new technologies
  11:40 Break
- 11:50 **Tour of Norma** 
  - 1:50 **Tour of Normanton Plant**
- 12:20 Lunch
- 13:00 Project Activities
- 15:00 **Caster Instrumentation** *current and new measurement methods to improve process control*
- 16:20 Break
- 16:30 **Continuous Casting Defects** *internal quality types, causes and solutions*
- 17:20 Discussion
- 17:30 End of Day 3

#### Thursday 11th June 2020

- 09:00 **Casting Mould Powders** functions, properties, selection criteria, determining performance
- 10:20 Break
- 10:30 Fluid Modelling for Process Improvement BOS furnace, tundish & casting mould
- 11:40 Break
- 11:50 Projects Activities
- 12:30 Lunch
- 13:10 Continuous Casting Defects surface quality & scarfing
- 14:00 Project Activities
- 15:00 Break
- 15:10 Clean steel theory & practice, determination
- 16:15 Project Activities
- 17:30 End of Day 4

#### Friday 12th June 2020

- 08:45 Alternative casting technologies thin slab, direct strip, 3D printing
- 10:00 Break
- 10:10 **Overview of Steelmaking & Casting Refractories**
- 11:20 **Project Presentations**
- 12:00 Course Review and Feedback
- 12:30 Lunch/ End of Course

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