



**Materials  
Processing  
Institute**



# Steelmaking & Continuous Casting Course 24th to 28th June 2019

## 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 moulds
- > 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](mailto:training@mpiuk.com)  
Website: [www.mpiuk.com/training](http://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 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 24th June 2019

- 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 25th June 2019

- 09:00 **Electric Arc Furnace** - theory & practice
- 10:10 Break
- 10:10 **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 **Compositional Control** - slag chemistry, low S & low H<sub>2</sub>, misfits
- 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 cleanliness & inclusion assessments
  - Tour of the Materials Processing Institute plant

### Wednesday 26th June 2019

- 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 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 27th June 2019

- 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 28th June 2019

- 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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