

Online seminar | Live-Stream

Continuous Casting of Steel

Basic Course

Established by Professor Klaus Schwerdtfeger

August 17th to 18th, 2021



AIM

Steel is the no 1 material in the world of technology. About 96% of all the total steel production is cast continuously. Automobiles, machines and countless parts of daily life are made of steel. New and innovative high-performance steel grades are created and combine several properties on a high level of quality. Plant design and casting processes are continuously developed.

This seminar introduces continuous casting technology. It provides the basic understanding of the process, its components and its metallurgy. Target Group: Engineers, operating personnel, planning and construction, quality department, students, machine suppliers. Also suitable for non-metallurgists

Advanced Courses are planned.

CHAIRMAN

Professor Dr.-Ing. Dr. h.c. Dieter Senk

REGISTRATION FEE

EUR 590, -* registration fee VAT-free

EUR 640, - registration fee VAT-free

* for employees of member companies and individual members of the VDEh. scientific staff of universities gets a 50 % off. Also 50 % discount for each additional participant from the same company location.

+++ as part of the VDEh youth development sponsorship also young engineers (up to 35 years) of member companies receive a 50% discount +++

A double discount is excluded.

Advanced courses are planned for 2022

Micro- and nanostructure, precipitates, steel grade related strand behavior, special cooling and heating technologies, soft reduction, design of guiding rolls, unwanted heat losses, fluid dynamics, shrinkage mechanisms, scale formation

More information will follow

CONTENT

Basic Concepts / Technology of Continuous Casting / Solidification and Temperatures / Micro-Structure / Macro-Segregation / Cleanness/Inclusions / Strand Mechanics / Casting Fluxes / Refractories / Automation

REGISTRATION

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THE LIVE STREAM

The Steel Academy attaches great importance to the audiovisual quality of its online seminars. The seminar will be broadcast as a live-stream from Steel Academy's film studio in Dusseldorf – with high quality camera, microphone and lighting. A moderator leads through the lectures.

In a moderated text-based chat, you can address your questions directly to the speaker.

Online seminar - how does it work?

2-3 days before seminar's starting you receive an e-mail with a link and a password, the link leads you to the streaming platform vimeo.com where you can log-in to the seminar.

Seminar handouts

Before seminar's starting the participant can download the presentations as pdf files.

Technical requirements

Windows or Mac computer, (tablet PC or smartphone also possible), current Internet browser.

Stable internet connection (preferably broadband)

We recommend a headset for better audio quality. The discussion takes place via chat, a microphone is not required.

Further details on the system requirements can be found on the help page of the online-seminar platform (www.vimeo.de).

PROGRAMME

Tuesday, 17th August 2021

- 09:00 **Introduction to Course**
- 09:15 **Basic Concepts**
Dieter Senk
General approach, Crash course. Fundamentals
- 09:45 Questions and answers
- 10:00 **Technology of Continuous Casting (Part 1)**
Jochen Wans
Principles of CC technology | Machine types and components
- 10:45 Coffee break
- 11:00 **Technology of Continuous Casting (Part 2)**
Jochen Wans
- 11:30 Questions and answers
- 11:45 **Solidification, Heat flux, Temperatures**
Karl-Hermann Tacke
Shell growth, crater end | Simplified models with applications | Thermal modelling | Heat extraction
- 12:45 Questions and answers / Coffee break
- 13:00 **Micro-Structure**
Dieter Senk
As-cast structure | Dendrites | Micro-segregation | Models.
- 14:00 Questions and answers

Wednesday, 18th August 2021

- 09:00 **Macro-Segregation**
Dieter Senk
Mechanisms of macro-segregation | Cooling effects.
- 10:00 Questions and answers
- 10:15 **Cleanness and Inclusions**
Karl-Hermann Tacke
Non-metallic inclusions | Fluid flow of steel and removal of inclusions
- 11:15 Questions and answers / Coffee break
- 11:30 **Strand Mechanics**
Karl-Hermann Tacke
Mechanical loads and cracks | Ductility, creep | Thermal stresses | Unbending | Bulging
- 12:30 Questions and answers / Coffee break
- 12:45 **Casting Fluxes**
Dieter Senk
Task of fluxes | Mineral composition | Melting mechanisms | Powder consumption
- 12:30 Questions and answers
- 12:45 **Refractories**
Dieter Senk
Use of refractories in CC | Ceramic composition | Melt and flux attack
- 13:15 Questions and answers
- 13:30 **Automation**
Jochen Wans
Automation levels | Sensors, actuators | Algorithms, models
- 14:15 Questions and answers

SPEAKERS

University Professor Dr.-Ing. Dr. h. c. Dieter Senk is responsible for the Chair of Iron and Steel Making at Dept. of Ferrous Metallurgy of RWTH Aachen University. Since nearly 40 years in steelmaking industry and university he is involved with numerous research and development projects to improve CC.

Professor Dr.-Ing. Karl-Hermann Tacke worked at Concast Zurich, was Head of the Department of Metallurgy at Max-Planck-Institut für Eisenforschung and Director of Research and Development at Dillinger Hüttenwerke. He is now an independent researcher and teaches continuous casting at Technical University Berlin.

Dr.-Ing. Jochen Wans worked as a metallurgist in the steelmaking industry before he changed his career to a plant manufacturer in the same business. Within numerous projects he is focused to connect material and process development in the field of CC. A major part of his sphere of action is dedicated to near-net-shape casting. Today he is Vice President Continuous Casting for SMS group GmbH.

ABOUT THE ORIGINATOR

University Professor Dr.-Ing. Klaus Schwerdtfeger worked a lifetime in the field of metallurgy, particularly in metallurgy of solidification. After leading the Metallurgical Dept. of Max-Planck-Institute at Düsseldorf he chaired the Dept. of General Metallurgy at TU Clausthal University. He hosted the Seminar from 1974 to 2017. The current course follows the spirit of the original seminar. The content is continuously updated.