

Online-Seminar / Live Stream

Electrical Engineering of Arc Furnaces

24 - 26 August 2020
at 8.30 a.m. till 1 p.m. CET



Siemens Pressebilder

CHAIRMAN

Prof. Dr.-Ing. Klaus Krüger, Max Aicher GmbH & Co. KG

ONLINE SEMINAR ORGANISATION

Technical quality:

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

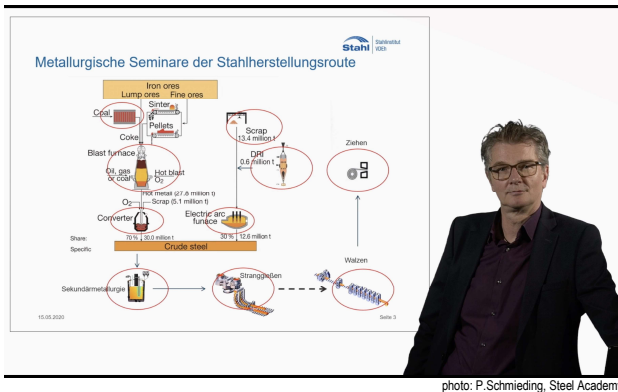


photo: P.Schmieding, Steel Academy

Online seminar - how does it work?

- after seminar registration you receive an e-mail with a link and a pass word
- at seminar's starting the link leads you to the streaming platform vimeo.com
- you log in with the pass word
- you need just a PC / laptop / tablet / mobile phone
⇒ no special program or software is required.

Schedule:

3 days, 4,5 hours in the morning 8.30 a.m. till 1 p.m.

Seminar handouts:

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

PROGRAMME

- Physics of Furnace-Arcs
- Equivalent Circuit-Diagram of AC-Furnaces
- Short Circuit and Operating Reactance
- Circle Diagram of AC-Furnaces
- Design of the High-current System for AC-Furnaces
- Electrical Layout of Electric Arc Furnaces
- Energy Balance of the Electric Arc and of the Furnace
- Energetic Modelling of the EAF process
- Closed Loop Power Control of AC Arc Furnaces
- Power Supply for Electric Arc Furnaces
- Electric Principles of DC-Furnaces // Comparison AC - DC

TARGET GROUP

Leading experts will present basic principles and new technologies of electric steelmaking for:

- EAF operating staff
- EAF maintenance staff
- steel shop operation managers
- steel shop installers

REGISTRATION

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PRICE

€ 750,00* // € 850,00 VAT-free

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

WEBINAR PROGRAMME

MONDAY, 24th of August, 2020

- 08:30 **Welcoming and Introduction**
Peter Schmieding
- 08:45 **Physics of AC and DC Arcs**
Klaus Krüger
Arc length and diameter / Steel bath impression / Arc characteristic / Instantaneous voltage and current / Arc deflection
- 09:45 [questions and answers / break](#)
- 10:00 **Equivalent Circuit-Diagram of AC-Furnaces**
Klaus Krüger
Single phase and three phase circuit-diagram / Application of complex variables / Vector diagrams / Short circuit reactance
- 11:00 [questions and answers / break](#)
- 11:15 **Short Circuit and Operating Reactance**
Klaus Krüger
Two and three phase short circuit test / Shift of the neutral point / Model and effect of the arc reactance
- 12:00 [questions and answers / break](#)
- 12:15 **Design of the high-current System for AC Furnaces**
Markus Abel
Transformer pins / Flex-strips / Connection through transformer wall / Power cables / Electrode arms
- 13:00 [questions and answers](#)
- 13:15 [end of 1st day](#)

TUESDAY, 25th of August, 2020

- 08:30 **Circle and Furnace Power Diagram of AC-Furnaces**
Klaus Krüger
Calculation of circle and furnace power diagram
- 09:30 [questions and answers / break](#)
- 09:45 **Electrical Layout of AC Furnaces**
Markus Abel
Different electrical designs for various charge materials (scrap, hot metal, DRI) and for various grades of steel (carbon/stainless)
- 10:45 [questions and answers / break](#)

- 11:00 **Energy Balance of the Electric Arc**
Thomas Echterhof
Electrical efficiency / Heat transfer from the arc to the melt / Energy balance of the electric arc / Parameters of the heat transfer / Fluid flow in slag and melt
- 11:45 [questions and answers / break](#)
- 12:00 **Energy Balance of the Electric Arc Furnace**
Thomas Echterhof
Energy consumption / Efficiency / Sankey diagram of the EAF / Energy recovery / Scrap preheating
- 12:45 [questions and answers](#)
- 13:00 [end of 2nd day](#)

WEDNESDAY, 26th of August, 2020

- 08:30 **Energetic Modelling of the Electrical Arc Furnace Process**
Bernd Kleimt
Model-based analysis of the energetic efficiency of Electric Arc Furnaces / Dynamic modelling of energy and mass balance / Online calculation of the melt temperature
- 09:15 [questions and answers / break](#)
- 09:30 **Closed Loop Power Control of AC-Furnaces**
Klaus Krüger
Control variables and control strategies of electrode position controls / Thermal based power control / Closed-loop reactor control
- 10:30 [questions and answers / break](#)
- 10:45 **Power Supply of Electric Arc Furnaces and Requirements of the Supply Network**
Detmar Arlt
Influence of the power supply network of arc furnaces / Network disturbances / Reactive power compensation
- 11:30 [questions and answers / break](#)
- 11:45 **Electric Principles of DC-Furnaces // Comparison AC – DC**
Klaus Krüger
System design / Rectification / Power diagram / Closed-loop current and voltage control / Arc deflection
- 12:45 [questions and answers](#)
- 13:00 [end of seminar](#)

SPEAKERS Dipl.-Ing. Markus Abel, tripleS GbR, Durbach ▪ Prof. Dr.-Ing. Detmar Art, University of Applied Sciences Duesseldorf
▪ Dr.-Ing. Thomas Echterhof, RWTH Aachen University ▪ Dr.-Ing. Bernd Kleimt, VDEh-Betriebsforschungsinstitut BFI, Duesseldorf ▪
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