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# International Seminars 2020

Seminars for the steel industry  
and related sectors



Steel Institute  
VDEh





## Electrical Engineering of Arc Furnaces

State of the art, future developments and economic aspects

[more](#)

9 to 11 March 2020 | Cologne, Germany

### Aim:

Leading experts will present basic principles and new technologies of electric steelmaking for maintenance and operating personnel, supervisors responsible for plant and unit operations and managers. Steel shop installers, third party inspectors and contract maintenance personnel will particularly benefit from detailed discussions on new developments and techniques

### Content

Physics of furnace-arcs | Equivalent circuit-diagram of AC-furnaces | Short circuit and operating reactance | Circle diagram of AC-furnaces | Power supply and requirements of the supply network | Furnace transformers | Design of the high-current system for AC-furnaces | Electrical layout of electric arc furnaces | Energy balance of the electric arc and the arc furnace | Graphite electrodes for EAF | Static var control | Power control of AC-furnaces | Electric principles of DC-furnaces | Energetic modelling of the electrical arc furnace process | Foaming slag control | Tutorial: calculation of circle diagrams of participant's EAF | electrical engineering of ladle furnace



## Cokemaking

Modern Processes and Methods in Cokemaking

[more](#)

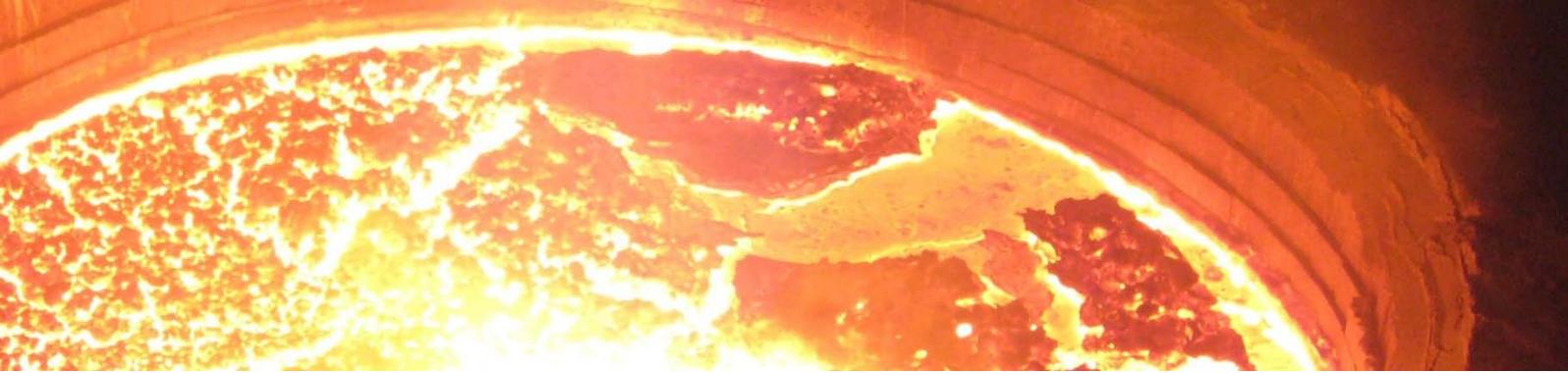
20 to 23 April 2020 | Duisburg, Germany

### Aim:

The seminar places the emphasis on quality of raw materials and on modern processes and methods in coke making. Lectures on iron and steel making, environmental aspects, refractories and by-products complement the programme

### Content:

The production of iron and steel | Blast furnace process | Coal formation, mining, beneficiation | Coal quality | Coal blending | Coal to coke transformation | Coke quality | Coke oven machine management | Battery heating | Coke quenching | Coke oven life prolongation | Refractory technology – coke oven lining | Shut down principles | Team work: shut down your coking plant! | By product plant operation | Future aspects of coke making | Coking plant tour



## Refractory Technology Refractory applications, wear mechanism, failures

[more](#)

26 to 29 April 2020 | Cologne, Germany

### Aim:

This seminar is intended for operating engineers of the iron and steel industry, the manufacturer and the user industries as well as employees of purchasing departments who wish to use the experience of manufacturers and users for their own activities.

### Content:

Steel manufacturing process | General overview of wear mechanisms | Economics in refractory usage | Failure case studies | Refractory lining concepts of the following aggregates: blast furnace, tap hole and runners, oxygen blowing converter, AC and DC electric arc furnaces, steel teeming ladle, continuous casting machine



## Refractory Technology Steel Ladle Lining

[more](#)

25 to 27 May 2020 | Dortmund, Germany

### Aim:

The wear of refractory materials in the secondary metallurgy is particularly high. These high wear mechanisms are complex, but mainly caused by slags. High temperatures, long-term treatment and turbulences of stirring gas are also important factors for wear and failures.

Maintenance and operating personnel, supervisors responsible for plant and unit operations, and managers responsible for decisions on refractory problems will learn about new materials and installation methods.

### Content:

Trends in clean steel technology and steel ladle lining | Demands on refractories for secondary metallurgy | Improvements of the steel ladle linings | Neutral steel ladle lining for flat steel production | Ladle lining for quality and engineering steels | Lining design for tank degassing operation | Monolithic lining in a 3-converter-shop | Ladle lining for flat steel production | Flexibility of refractory lining for varying operating conditions | Team work: optimization of economics in refractories



## Converter Seminar Oxygen Steelmaking

[more](#)

22 to 24 June 2020 | Dortmund, Germany

### Aim:

Although oxygen steelmaking is a well-known process there are a lot of current challenges for the operating engineer: the quality of raw materials, process control, different operating practices, modelling, CFD and Industry 4.0. Next to these new questions the seminar programme also includes the important basics thermodynamics, chemical reactions kinetics, heat and mass balance and a lecture on tramp elements.

Our target groups are: Steel shop operating staff, Employees in R&D, supervisors responsible for decisions on metallurgy, energy, purchasing, environmental protection and raw material staff

### Content:

History, developments and types of oxygen converters | Thermodynamic and kinetic basics in the converter process | Tramp elements | hot-metal pretreatment | Design and construction of modern oxygen converters | Computational fluid dynamics in the converter | Chemical reactions kinetics: refining reactions and slag forming in the BOF process | Mass balance and heat balance | Converter process modelling | Resources and qualities of raw materials | Comparison of different converter operation practices: US – Europe – Japan | Practical approaches of 2- and 3-converter shops | Environmental aspects: de-dusting | Steel panel on raw materials and operation practices



## Continuous Casting of Steel

Practical and scientific approaches

[more](#)

31 August to 3 September 2020 | Cologne, Germany

### Aim:

This continuous casting course is prepared to train persons in continuous casting of steel. In half a week the essential topics of CC are explained in detail. The lectures are supported by exercises to intensify learning. The course is suitable to give an overview to newcomers and to train operating engineers in theoretical fundamentals. Also within the group many possibilities of fruitful discussions are given and realized.

### Content:

Introduction to metallurgy of solidification | Technology of continuous casting of steel | Cooling systems | Strand guiding | Mechanical stress | Heat transfer in continuous casting | Development of as-cast structure | Fluid flow in mold and SEN | Performance of casting flux in the mold | Surface defects | Coupling of casting and rolling | Visit of the continuous casting section of a steel plant



## Preview on 2021

### Ironmaking

Modern processes and methods in ironmaking

Spring 2021 | Germany

#### Aim:

The seminar offers a wide range of ironmaking aspects (raw materials, chemistry, operation practice, modelling, environment, energy, direct reduction et al.) and completes the theory with a practical steel plant tour

#### Content

Materials chemistry | Production of iron and steel | Types and characteristics of iron ore | Agglomeration of fines: sintering and pelletizing | Coal for cokemaking | Cokemaking technology | Chemical and physical processes in the blast furnace | Application of reducing agents | Blast furnace performance | Blast furnace operation practice | Hearth and deadman dynamics | Operational challenges | Modelling and simulation | Energy network in integrated iron and steel works | Quality and use of blast furnace slags | Direct reduction and smelting reduction | Environmental protection | Exercise: Various BF operation practices | Iron and Steel plant tour



## Information and Registration

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The Steel Academy is the leading institution for advanced professional trainings on metallurgy and material technology. The Academy has now been in existence for more than 40 years as the cross-company training arm of the German steel industry and related sectors.