

13<sup>th</sup> international seminar  
including steel plant tour

# Steel Ladle Lining

Refractory concepts for a complex reactor

14 - 16 May 2024  
Düsseldorf, Germany



## DIRECTED BY

Dr. Andreas Buhr  
Dr. Helmut Lachmund

## TARGET GROUP

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-terming 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.

## VENUE / SEMINAR HOTEL

NH Hotel Düsseldorf City  
Kölner Str. 186-188 • 40227 Düsseldorf, Germany  
[www.nh-hotels.com/en/hotel/nh-duesseldorf-city](http://www.nh-hotels.com/en/hotel/nh-duesseldorf-city)

The Steel Academy will automatically make a room booking for the participants at the NH Hotel Düsseldorf City from 14-16 May 2024 for a special rate of EUR 209 together for both nights incl. breakfast. The hotel room bill will be settled by you upon departure. Please advise at your registration, if you do not need a reservation or whether you would like to stay longer in the hotel.

## ORGANISATION / REGISTRATION

Steel Academy • Steel Institute VDEh  
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## CONTENT

- Trends in clean steel technology and steel ladle lining
- Demands on refractories for secondary metallurgy
- Salzgitter Flachstahl: Improvements of the steel ladle linings
- DEW: Refractory lining for varying operating conditions
- thyssenkrupp Steel: Improvement of lining for a 400 mt steel ladle
- Tata Steel Port Talbot: Thermal efficiency of teeming ladles
- Tata Steel Ijmuiden: Steel ladle lining for flat steel production
- SSAB Finland: Monolithic lining in a 3-converter-shop
- PAHAGE: Purging plugs in steel ladles
- **Exercise:** Optimization of economics in refractories
- **Teamwork:** The digitalized steel ladle
- **Steel plant and refractory tour at thyssenkrupp Steel Europe**

## REGISTRATION FEE

EUR 990,00\* registration fee VAT-free plus  
EUR 268,50 conference package (total EUR 1.258,50\*)

EUR 1190,00 registration fee VAT-free plus  
EUR 268,50 conference package (total EUR 1.458,50)

\* for employees of member companies and individual members of the Steel Institute VDEh. Scientific staff of universities gets a 50 % off

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

The conference package includes food and beverages during the seminar (incl. 19 % VAT). The catering included in the seminar fee starts with a welcome coffee on 14 May and ends with lunch on 16 May. This fee does not include the hotel room.

A free withdrawal from the seminar is possible until two weeks prior to the start. Then, 25% of the seminar fee must be paid. The total registration amount will be charged for no show or cancellation from the first day of the event. The participant also has to bear the cancellation costs of the seminar hotel.

# PROGRAMME

## Tuesday, 14 May 2024

- 2.00 p.m. **Introduction – Trends in clean steel technology and steel ladle lining**  
Andus Buhr, Almatís  
Trends in secondary metallurgy and steel ladle lining / Dream ladle lining
- 3.30 p.m. **Demands on refractories for secondary metallurgy**  
Helmut Lachmund, former Dillinger  
Increased tapping temperature / Longer residence time of steel in the ladle / Metal-slag reactions / Recarburisation by refractory material / Reaction steel and refractory materials
- 4.30 p.m. coffee break
- 5.00 p.m. **Improvements of steel ladle lining**  
Jens Pischke, Salzgitter Flachstahl  
Ladle logistics and secondary metallurgy / Lining concept, wear lining and safety lining / Precast components / Refractory maintenance / Refractory improvements
- 6.00 p.m. **Flexibility of refractory lining for varying operating conditions**  
Matthias Schwarz, DEW  
Balanced lining for various tapping weights and a wide range of steel grades / Ladles for operation in LF, RH and VOD / Dolomite lining / Low carbon stainless steels: Carbon pick up  
=> afterwards: common dinner

## Wednesday, 15 May 2024

- 8.30 a.m. **Improvement of lining for a 400 mt steel ladle**  
Kai Werner, thyssenkrupp Steel Europe  
Increase of tapping weight / Simplified lining concept
- 9.30 a.m. **Exercise**  
**Optimization of ECONOMICS IN REFRACTORIES, Part I**  
Rinus Siebring, Tata Steel Europe, IJmuiden  
Presentation of a model on refractory optimization
- 10:30 a.m. coffee break
- 11.00 a.m. **Exercise**  
**Optimization of ECONOMICS IN REFRACTORIES, Part II**  
Exercises and team work on refractory optimization

- 12.45 p.m. common lunch
- 2.00 p.m. bus departure to  
**thyssenkrupp Steel, Duisburg**
- 3.00 p.m. **Steel works and refractory tour**
- 7.00 p.m. arrival back in Düsseldorf  
=> afterwards: common dinner

## Thursday, 16 May 2024

- 8.30 a.m. **Thermal efficiency and management of teeming ladles**  
Matthew Davies, Tata Steel PortTalbot  
Thermal modelling and measurements, ladle campaign prediction, thermal stability of insulating materials
- 9.30 a.m. **Neutral steel ladle lining for flat steel production**  
Marcel Peekel, Tata Steel IJmuiden  
Overview of current steel ladle construction, ladle operation and impact of refractories performance / Recent developments
- 10.30 a.m. coffee break
- 11.00 a.m. **Monolithic ladle lining in a 3-converter shop**  
Jukka Vatanen, SSAB Finland  
Refractory materials for steel ladle / Installation of monolithic-brick combined lining / Reduction of specific refractory consumption / Ladle injuries
- 12.00 a.m. common lunch
- 1.00 p.m. **Purging plugs in steel ladles – important factors for reliable performance**  
Stephan Clasen, PAHAGE  
Interaction refractory material and quality, purging plug's geometry and gas channel system
- 2.00 p.m. **Teamwork**  
**The digitalised steel ladle**  
Rinus Siebring  
Opportunities / Cooperation between steel plants and suppliers / Threats / Current status / Tools
- 3.00 p.m. **Summary**  
Andus Buhr
- 4.00 p.m. **End of seminar**

**SPEAKERS** Dr. rer. nat. Andreas Buhr, Almatís GmbH, Frankfurt ▪ Dr.-Ing. Stephan Clasen, PAHAGE Feuerfeste Erzeugnisse GmbH, Viersen ▪ Matthew Davies, Tata Steel Port Talbot ▪ Dr.-Ing. Helmut Lachmund, Dillingen ▪ Dr. Annika Mertke, Salzgitter Flachstahl GmbH, Salzgitter ▪ Marcel Peekel, Tata Steel Europe IJmuiden ▪ Jens Pischke, Salzgitter Flachstahl, Salzgitter ▪ Dr.-Ing. Matthias Schwarz, Deutsche Edelstahlwerke Specialty Steel, Siegen ▪ Rinus Siebring, Tata Steel Europe, IJmuiden ▪ Jukka Vatanen, SSAB Europe Oy, Raahen ▪ Kai Werner, thyssenkrupp Steel Europe, Duisburg ▪ Organisation: Peter Schmieding, Steel Academy, Steel Institute VDEh, Duesseldorf