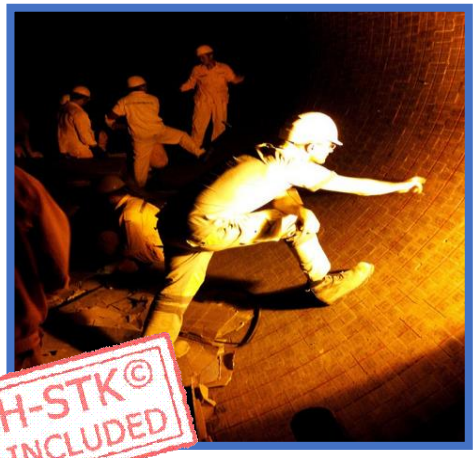
COURSE OVERVIEW FE0853
Refractory Technology & Applications in Steel Making Plants

Course Title
Refractory Technology & Applications in Steel Making Plants



Course Date/Venue
Session 1: February 16-20, 2025/Crowne Meeting Room, Crowne Plaza Al Khobar, KSA
Session 2: December 07-11, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

Course Reference
FE0853

Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

Course Description

This practical and highly-interactive course includes real-life case studies and exercises where participants will be engaged in a series of interactive small groups and class workshops.

Refractory technology has changed significantly in recent years as new monolithic materials have replaced brick in many industries. Vibratable and pumpable castables with superior properties, as well as significantly improved brick, ceramic fiber products, and other items, make optimum refractory selection complex. Advanced construction methods must be utilized if these improved materials are to achieve their maximum service life.

This course is designed to provide participants with a detailed and up-to-date overview of refractory technology and applications in steel making plants. It covers the identification and classification of various types of refractory; the thermal, chemical and mechanical properties of refractory; the refractory application in steel making plant; the refractory behavior in SMP working condition; the special shapes of refractory used in SMP; and the refractory installation and thermal stability of refractory in SMP.

During this interactive course, participants will learn the refractory with slag contact in EAF & LRF; the criteria of refractory selection in SMP; the contamination of steel by refractory; the refractory manufacturing and reduction decomposition of Mg0 and Si02; and the factors affecting corrosion resistance including quality and cost-control.

Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Apply and gain an in-depth knowledge on refractory technology and application in steel making plants
- Identify and classify the various types of refractory
- Discuss the thermal, chemical and mechanical properties of refractory
- Carryout refractory application in steel making plant and describe the refractory behavior in SMP working condition
- Recognize the special shapes of refractory used in SMP and apply refractory installation
- Describe the thermal stability of refractory in SMP including the refractory attack with slag contact in EAF and LRF
- Identify the criteria of refractory selection in SMP and the contamination of steel by refractory
- Apply refractory manufacturing and reduction-decomposition of Mg0 and Si02
- Identify the factors affecting corrosion resistance including the quality and cost-control

Exclusive Smart Training Kit - H-STK®

*Participants of this course will receive the exclusive "Haward Smart Training Kit" (**H-STK®**). The **H-STK®** consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of refractory technology and applications in steel making plants for those who are responsible for refractory material design, application, installation and inspection.

Course Fee

US$ 10,000 per Delegate + **VAT**. This rate includes Participants Pack (Folder, Manual, Hand-outs, etc.), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations: -

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

- The International Accreditors for Continuing Education and Training (IACET - USA)

Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:

Mr. Michael Linck, MBA, BBA, is a **Senior Piping & Mechanical Engineer** with over **30 years** of practical experience in the **Oil**, **Gas**, **Petrochemical** and **Power** industries. His expertise covers **Refractory Inspection**, **ASME Post Construction Code**, **Inspection Planning**, **Fitness-for-Service**, **Damage Mechanisms & Repair of Vessels**, **Tanks**, **Piping & Process Equipment**, **Pipeline Pigging**, **Pipeline Integrity Assessment**, **Corrosion Monitoring**, **Control**, **Prevention** and **Inspection**, **Screw Compressors**, **Building & Facilities Maintenance Management**, **Maintenance Planning**, **Maintenance Auditing & Benchmarking**, **Risk Management Program** (**RMP**), **Reliability**, **Availability & Maintability** (**RAM**), **Material Cataloguing**, **planning** and **implementation** of small to large **boiler projects**, **insulation**, **scaffolding**, installation, operation and inspection of steel, cement, petrochemical and power industries, both new installations and aftermarket service projects. Currently, he is the **VP of Operations** for **Refractory Repair Services** as well as the **President** of **LINCK REFRACTORY INTERNATIONAL SERVICES**, taking full charge of all refractory and mechanical maintenance related operations.

Earlier in his career life, Mr. Linck held numerous significant and challenging positions as the **Commissioning Specialist**, **Maintenance Specialist**, **Contract Specialist**, **Site Manager**, **General Manager**, **Project Manager**, **Branch Manager**, **Construction Manager**, **Manager** and **Contract Site Service Representative** in several international companies such as **Foster Wheeler**, **NV Gouda Vuurvast**, **Insultec Ltd**., **National Refractories Clay Alumina Specialties**, **Thermo Tech**, **Turnaround Maintenance Inc**., **Solar Industries** and **Anco Industries**.

Mr. Linck has a **Master's** and **Bachelor's** degree in **Engineering** from the **North Texas University** and **University of Dallas** respectively. He is **certified** as an **API 936 Refractory Personnel, a Certified API 982 Refractory Inspector** early in 2003 as well as holds or has held state contracting licenses related to heavy construction and engineering in West Virginia, Mississippi, Louisiana, Oklahoma and Arizona

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

30% Lectures
20% Practical Workshops & Work Presentations
30% Hands-on Practical Exercises & Case Studies
20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Introduction***
0930 – 0945	*Break*
0945 – 1045	***Refractory Concepts Identification***
1045 – 1200	***Refractory Classification & Types of Refractories***
1200 – 1215	*Break*
1215 – 1300	***Refractory Properties (Thermal Properties)***
1300 – 1420	***Refractory Properties (Chemical & Mechanical)***
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0930	***Refractory Application in Steel Making Plant (SMP)***
0930 – 0945	*Break*
0945 – 1045	***Refractory Behaviour in SMP Working Condition***
1045 – 1200	***Special Shapes of Refractory Used in SMP***
1200 – 1215	*Break*
1215 – 1420	***Refractory Installation (Practice & Theory)***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0930	***Thermal Stability of Refractory in SMP***
0930 – 0945	*Break*
0945 – 1045	***Thermal Stability of Refractory in SMP (cont'd)***
1045 – 1200	***Refractory Attack with Slag Contact in EAF***
1200 – 1215	*Break*
1215 – 1420	***Refractory Attack with Slag Contact in LRF***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

0730 – 0930	***Criteria of Refractory Selection in SMP***
0930 – 0945	*Break*
0945 – 1045	***Criteria of Refractory Selection in SMP (cont'd)***
1045 – 1200	***Contamination of Steel by Refractory in Tundish***
1200 – 1215	*Break*
1215 – 1420	***Notes on Refractory Manufacturing***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5

0730 – 0930	***Reduction-Decomposition of Mg0 and Si02***
0930 – 0945	*Break*
0945 – 1045	***Factors Affecting on Corrosion Resistance***
1045 – 1200	***Quality & Cost Control***
1200 – 1215	*Break*
1215 – 1300	***Free Discussion***
1300 – 1400	***Course Conclusion***
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Practical Sessions

This practical and highly-interactive course includes real-life case studies and exercises:-

Course Coordinator

Mari Nakintu, Tel: +971 2 30 91 714, Email: mari1@haward.org