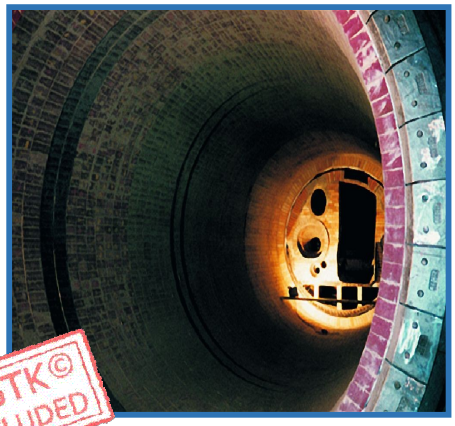
COURSE OVERVIEW FE0851(GA2)
Fireproofing

Course Title
Fireproofing

Course Date/Venue
Session 1: January 20-24, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
Session 2: August 17-21, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE



Course Reference
FE0851(GA2)

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

Course Description

This practical and highly-interactive course includes various practical sessions and. Theory learned will be applied using our state-of-the-art equipment.

The aim of this course is to provide sufficient information and proper techniques for senior civil engineers, managers and those who are responsible for the design and inspection of refractory and fireproofing materials in gas plant and refineries. It covers the burnpits including its general arrangement, types and suitable application of refractory bricks/tiles, monolithics and castable; refractory design, installation, inspection and repair based on international codes and standards as well as the details dealt in related to DEPs and other industrial codes.

The course will also cover the fireproofing procedure for steel structures and vessels skirting; the global sources of castables, refractories, fireproofing materials; the details and specifications of related materials like refractory mortars, ceramic fibre blankets, refractory bricks standard sizes, properties and fixing accessoriess; and the materials certification requirement for refractory and fireproofing materials.

At the end of the course, participants will be able to use of refractories in refineries, furnace linings and other areas; define thermal shocks, max temperature of different refractory materials and reinforcement of castables; conduct heat loss calculations through refractories and metallic pipe encasements using castables; and identify the refractory interface with metal/concrete and the thickness determination for each of applications/materials.

Course Objectives

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

- Design and inspect refractory and other fireproofing materials in gas plants and refinery
- Explain burnpits including its general arrangement, types and suitable application of refractory bricks/tiles, monolithics and castable, etc
- Discuss refractory design, installation, inspection and repair based on international codes and standards as well as the details dealt in related to DEPs and other industrial codes
- Explain the fireproofing procedure for steel structures and vessels skirting
- Recognize the global sources of castables, refractories, fireproofing materials, etc
- Classify the details and specifications of related materials like refractory mortars, ceramic fibre blankets, refractory bricks standard sizes, properties, fixing accessories, etc
- Recognize the materials certification requirement for refractory and fireproofing materials
- Describe the use of refractories in refineries, furnace linings and other areas
- Define thermal shocks, max temperature of different refractory materials and reinforcement of castables
- Conduct heat loss calculations through refractories and metallic pipe encasements using castables
- Determine the refractory interface with metal/concrete and the thickness determination for each of applications/materials

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 the refractory and fireproofing materials in gas plant and refineries in gas plants/refinery for senior civil engineers, managers and those who are responsible for the design and inspection of refractory/fireproofing materials in gas plants.

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. Mohamed Kader, BSc, PgDip, PMI-PMP, NDT, CSWIP, API is a **Senior Mechanical & Inspection Engineer** with over **20 years** of practical experience within the **Oil & Gas**, **Petrochemical** and **Refinery industries**. His expertise widely covers in the areas of **Pressure Vessel** Design & Analysis, **Tank & Vessels** Inspection, Repair & Modification, **Pressure Vessels** Inspection, **Steam & Gas Turbine**, **High Pressure Boiler** Operation, **Compressors** Operation & Maintenance, **Pipe** Maintenance & Repair, **Centrifugal & Positive Displacement Pump**, **Rotating Machinery, Tank Repairs**, **Design**, **Fabrication**, **Construction**, **Installation**, **Commissioning**, **Inspection & Maintenance** of **Process Equipment**, **Aboveground Storage** Tank Inspection, **Tank Repair**, **Alteration & Reconstruction**, **Steam Generator** Repair, **Boilers**, **Piping** Systems, **Pipeline** Operation & Maintenance, **Pipeline** Systems, **Pipeline** Design & Construction, **Pipeline** Inspection & Rehabilitation, **Corrosion**, Fitness for Service (**FFS**), Risk Based Inspection (**RBI**), **Integrity** Management, **Pipeline** Rehabilitation & Repair, **Pipeline** Design & Maintenance, **Pipeline Integrity** Assessment, **Corrosion Monitoring & Cathodic Protection**, **Pressure & Leak** Testing, Piping Inspection, Pipe Lines, Piping Fabrication, Pipe Flow, Gas Pipe Line, Non-Destructive Testing & Engineering Materials, NDT Methods & Application, Magnetic Particle Inspection & Testing, Radiographic Inspection & Testing, Visual Inspection, Leak Testing, Cathodic Protection, Welding Inspection, Welding Technology, Welding & Fabrication, Welding Defects Analysis, Welding Engineering, Welding Procedure Specification, Welding Quality & Control, Damage Mechanisms, Pressure Vessels, Tanks, Heat Exchangers, RT Films Interpretation, Fire Heaters Revamping, Waste Water Heater, Distillation Towers, Crude Oil Tank, Steam Power Plant, Spherical Tanks and Asset Integrity Management. Further, he is also well-versed in **Contract** Management & Administration, **Project** Management, **Project** Scheduling & Cost Control, **Project** Supervision, **Project** Reporting, **Project Investment** & **Risk Analysis**, **Project** Delivery & Governance Framework, **Project Risk** Management, **Risk** Identification Tools & Techniques, **Project** Life Cycle, **Project Stakeholder** & **Governance**, **Project Time** Management, **Project Cost** Management, **Project Quality** Management and **Quality** Assurance. He is currently the **Project Manager** of SOPCO wherein he is managing the project team, evaluating projects and ensuring that the projects meet the quality standards.

During his career life, Mr. Mohamed occupied several significant positions and dedication as the **Projects Engineer**, **Mechanical Engineer**, **Piping & QC Leader**, **Piping Engineer**, **QA/QC Engineer** and **Senior Trainer/Instructor** for various international companies like the Gulf of Suez Petroleum Company (GUPCO), Khalda Petroleum Company (KPC), ADMA-OPCO, Kahalda Petroleum Company, East Gas and MASSA Inspection and Consultation Company.

Mr. Mohamed has a **Bachelor's** degree in **Mechanical Power Engineering** and a **Postgraduate Diploma** in **Welding Science & Technology**. Further, he is a **Certified Instructor/Trainer**, a **Certified Project Management Professional** (**PMI-PMP**), a **Certified Senior Welding Inspector** (**CSWIP 3.1**), a **Certified API 510 Pressure Vessel Inspector**, a **Certified API 570 Piping Inspector**, a **Certified API 653 Tank Inspector** and a **Certified NDT Level II Inspector** in Radiographic Testing (**RT**), Ultrasonic Testing (**UT**), Magnetic Particle Testing (**MT**) and liquid Penetrant Testing (**PT**). He has further delivered numerous trainings, courses, seminars, conferences and workshops internationally.

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.

Accommodation

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

Course Fee

US$ 5,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

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 to Refractories***
0930 – 0945	*Break*
0945 – 1100	***Burnpits*** *General Arrangement ● Identifying Critical Parameters and some Recommended Configurations (Peak Liquid Discharge Rate, Regression Rate, Limited Liquid Quantity, Peak Vapor Inflow, Burner Size, Shape of the Burn Pool, Flame Size and Prevailing Wind)*
1100 – 1230	***Burnpits (cont'd)*** *Refractory Design, Installation, Inspection & Repair Based on International Codes & Standards (Primary Materials, Concrete and Flexible Membrane Liners) ● Several Types of Refractory Bricks/Tiles and Suitable Application for each Type (Brick Burn Pit, Gunned or Wet Gunned, Crushed Stone and Earthen Berm)*
1230 – 1245	*Break*

1245 – 1420	***Burnpits (cont'd)*** *Types & Recommended Applications of Monolithics & Castables As Applicable (Refractory Brick Medium Duty Firebrick using the following specifications: Porosity ≥ 25%, Fe2O3 ≤ 0.5%, Operating Temperature ≥ 1260, Al2O3 Content ≥ 40%, Density ≥ 1925kg/m3, Modulus of rupture ≥ 5.5 Mpa and Cold Crushing Strength ≥ 14 Mpa) ● Details Dealt in Related DEPs & Other Industrial Codes (ASTM Refractory Codes, DIN and ISO)*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day One*

Day 2

0730 – 0830	***Fireproofing of Steel Structures & Vessels Skirting*** *Materials Types & Specifications (Cementitious, Intumescent Coatings and Blanket)*
0930 – 0945	*Break*
0945 – 1115	***Fireproofing of Steel Structures & Vessels Skirting (cont'd)*** *Behavior of Different Materials to Fire Exposure/Temperature Variation*
1115 – 1230	***Fireproofing of Steel Structures & Vessels Skirting (cont'd)*** *Design, Installation, Inspection & Repair Based on International Codes & Standards (EAPFP (European Association for Passive Fire Protection), NFPA 30, 2008. 2008 Edition, Flammable and Combustible Liquids Code, API 2218 2nd Edition, 1999, Fireproofing Practices in Petroleum and Petrochemical Processing Plants, BS 476-20, 1987, Fire Tests on Building Materials and Structures, ASTM E1529, 2010, Standard Test Methods for Determining Effects of Large Hydrocarbon Pool Fires, On Structural Members and Assemblies and ASTM E84, 2011, Standard Test Method for Surface Burning Characteristics of Building Materials) ● Details Dealt in Related DEPs & Other Industrial Codes*
1230 – 1245	*Break*
1245 – 1420	***Global Sources of Castables, Refractories, Fireproofing Materials, etc*** *USA Materials and Suppliers ● European Materials and Suppliers ● Asian Materials and Suppliers ● Australia Materials and Suppliers*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Two*

Day 3

0730 – 0830	***Details & Specifications of Related Materials*** *Refractory Mortars (Insulation Mortars, Super duty Mortars and Specialty Mortars) ● Ceramic Fibre Blankets (Ceramic and AES (Alkaline Earth Silica's), Blankets, Ropes, Paper, Felt, Boards and Micro Porous)*
0930 – 0945	*Break*
0945 – 1115	***Details & Specifications of Related Materials (cont'd)*** *Refractory Bricks Standard Sizes, Properties (IFB – 2100, 2300, 2600, 3000 IFB, Medium Duty, Super Duty, High Abrasion and Specialty) ● Fixing Accessories (Anchors, Metallic Grades, Ceramic Anchors and Brick Tie Backs) ● etc*

1115 – 1230	***Materials Certification Requirement (e.g. UL, etc.)***
1230 – 1245	*Break*
1245 – 1420	***Brief Description of Use Of Refractory in Refineries, Furnace Linings & at Other Areas*** *Industry Uses of Refractory ● Refineries ● Cement ● Steel ● Power Plants*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Three*

Day 4

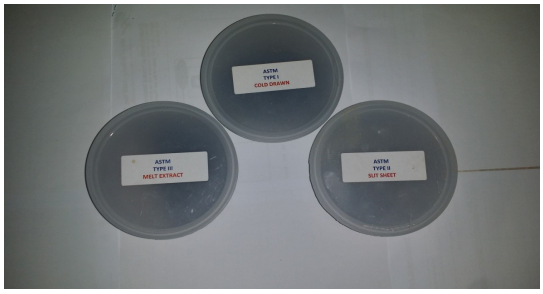
0730 – 0830	***Thermal Shocks*** *What is Thermal Shock ● What causes Thermal Shock*
0930 – 0945	*Break*
0945 – 1115	***Thermal Shocks (cont'd)*** *What Material to Use for Thermal Shock ● Tests to Substantiate Thermal Shock*
1115 – 1230	***Max Temperature of Different Refractory Materials*** *Determining Maximum Operation Temperatures for Refractory Materials ● Testing for Temperatures in Refractories*
1230 – 1245	*Break*
1245 – 1420	***Reinforcement of Castables*** *Metallic Fibres ● Why they are Used ● Where they are Used*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Four*

Day 5

0730 – 0830	***Heat Loss Calculations through Refractories*** *Heat Loss Calculation ● Programs ● Variables ● Issues with Heat Loss ● Insulation Values of Refractories ● Testing for Heat Loss ● Use of IR Camera and Field Evaluation*
0930 – 0945	*Break*
0945 – 1115	***Metallic Pipe Encasements Using Castables*** *Differential Expansion of Refractory and Piping ● Lined Duct Work ● Supporting Piping/ Duct Work ● Expansion Joints*
1115 – 1230	***Refractory Interface with Metal/Concrete*** *Differential Expansion of Refractory and Piping ● Expansion Joints*
1230 – 1245	*Break*
1245 – 1345	***Thickness Determination for each of Applications/Materials*** *Economical Use of Refractory ● Calculation of Maintenance of Refractory Linings*
1345 – 1400	***Course Conclusion***
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Practical Sessions

Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout welding inspection using the "Refractory Kit, suitable for classroom training.



REFRACTORY KIT

Course Coordinator

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