

COURSE OVERVIEW PE0382 Heat Exchangers & Fired Heaters

Course Title

Heat Exchangers & Fired Heaters

Course Date/Venue

December 07-11, 2025/TBA Meeting Room, Mövenpick Hotel Istanbul Golden Horn, Istanbul, Turkev

Course Reference

PE0382

Course Duration/Credits

Five days/3.0 CEUs/30 PDHs

Course Description









course is designed to provide This participants with a detailed and up-to-date overview on the operation and troubleshooting of heat exchangers and fired heaters. Participants will be able to respond to typical heat exchanger and fired heater problems that may occur during operation. The course will also cover the principles of heat transfer and the factors affecting heat transfer; the flow arrangements of fluids inside heat exchangers; and the various types and its major components.

During this course, participants will learn to apply the proper procedure in taking out of service and putting in service of heat exchangers; identify the various types of furnaces and the major parts of a horizontal and vertical furnace; recognize the types of gas burner and its properties; apply combustion process; employ furnace start up, shutdown and troubleshooting; identify the thin tube, hot spot, tube fire side heater, furnace explosion, flame temperature, flame stability and combustion.























Course Objectives

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

- Operate and troubleshoot heat exchangers and fired heaters in a professional manner
- Discuss the principles of heat transfer and the factors affecting heat transfer
- Illustrate flow arrangements of fluids inside heat exchangers and identify the types and its major components
- Apply proper procedure in taking out of service and putting in service of heat exchangers
- List the various types of furnaces and identify the major parts of a horizontal and vertical furnace
- Enumerate the types of gas burner and describe its properties as well as combustion process
- Employ furnace start up, shutdown and troubleshooting
- Identify thin tube, hot spot, tube fire side heater, furnace explosion, flame temperature, flame stability and combustion

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 heat exchangers and fired heaters operation for process engineers, section heads, shift controllers, shift supervisors, operators and for those who are interested in heat exchangers and furnaces.

Training Methodology

All our Courses are including Hands-on Practical Sessions using equipment, Stateof-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 Fee

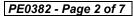
US\$ 8,800 per Delegate + VAT. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.





















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.

Accommodation

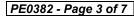
Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.





















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. Karl Thanasis, PEng, MSc, MBA, BSc, is a Senior Engineer with over 30 years of practical experience within the Oil, Gas, Refinery and Petrochemical industries. His wide expertise includes Process Plant Optimization Technology & Continuous Improvement, Process Engineering Calculations, Process Plant Start Up & Commissioning, Applied Process Engineering Elements, Coke Cooler, Process Plant Start-up & Commissioning, Process Plant

Troubleshooting, Operations Abnormalities & Plant Upset, Process Equipment Applications & Troubleshooting, Process Plant Performance & Efficiency, Gas Sweetening & Sulphur Recovery, Distillation-Column Control & Troubleshooting, Oil Movement & Troubleshooting, Process Plant Operations & Control, Process Equipment Operation, Fired Heaters & Air Coolers Maintenance, Heat Exchangers, Pumps & Compressors, Crude Desalter, Pressure Vessels & Valves, Steam Pumps & Valve Maintenance & Troubleshooting. Trapping & Control. Turbomachinery, Mechanical Alignment, Rotating Equipments, Diesel Lubrication Technology, Bearing, **Predictive** Generators. & Preventive Maintenance, Root Cause Analysis, Boilers, Oil Field Operation, Production Operation, Plant Operation & Commissioning, Crude Oil De Salting Process, Gas Conditioning, NGL Recovery & NGL Fractionation, Flare System, Storage Tanks, Oil Recovery System and Chemical Injection.

Mr. Thanasis has acquired his thorough and practical experience as the Project Manager, Plant Manager, Area Manager - Equipment Construction, Construction Superintendent, Project Engineer and Design Engineer. His duties covered Plant Preliminary Design, Plant Operation, Write-up of Capital Proposal, Investment Approval, Bid Evaluation, Technical Contract Write-up, Construction and Subcontractor Follow up, Lab Analysis, Sludge Drying and Management of Sludge Odor and Removal. He has worked in various companies worldwide in the USA. Germany, England and Greece.

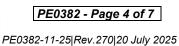
Mr. Thanasis is a Registered Professional Engineer in the USA and Greece and has a Master and Bachelor degrees in Mechanical Engineering with Honours from the Purdue University and SIU in USA respectively as well as an MBA from the Further, he is a of Phoenix in USA. Certified Verifier/Trainer/Assessor by the Institute of Leadership & Management (ILM) and a Certified Instructor/Trainer.























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: Monday, 03rd of November 2025

Day I.	Monday, 03° of November 2025
0730 - 0800	Registration & Coffee
0800 - 0815	Welcome & Introduction
0815 - 0830	PRE-TEST
	Heat Exchangers
	Introduction to Heat Exchangers • Principles of Heat Transfer • Factors
0830 - 0915	Affecting Heat Transfer (Conduction, Convection & Radiation) • Flow
	Arrangement of Fluids Inside Heat Exchanger • Types of Heat Exchangers •
	Major Components
0915 - 0930	Break
	Heat Exchangers (cont'd)
0930 - 1030	Shell & Tube • Fixed Tube Sheet • Floating Tube Sheet • Return Bend Heat
	Exchanger • Plate Type Heat Exchanger
	Heat Exchangers (cont'd)
1030 – 1200	Double Type Heat Exchanger • Parallel Flow • Counter Flow • Temperature
	Approach in Heat Exchanger • LMTD • Correction Factor
1200 – 1215	Break
	Heat Exchangers (cont'd)
1215 – 1420	Allocation of Fluid in Heat Exchanger • Shell & Tube Passes • Cross Flow
	Heat Exchanger • Overall Heat Transfer Coefficient
1420 - 1430	Recap
1430	Lunch & End of Day One

Tuesday, 04th of November 2025 Dav 2:

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0730 - 0915	Heat Exchangers (cont'd) Principles of Heat Allocation • Corrosion • Fouling • Temperature • Pressure
0915 - 0930	Break
0930 - 1030	Heat Exchangers (cont'd) Differential Pressure • Viscosity • Design Considerations • Hair Pin Heat Exchanger • Aerial Cooler
1030 – 1200	Heat Exchangers (cont'd) Main Components • Draft • Louvers • Blades • Vibration
1200 - 1215	Break
1215 – 1420	Heat Exchangers (cont'd) Causes & Correction • Fouling Factor • Factors Affecting Heat Transfer • Procedure to Take Heat Exchanger Out of Service • Procedure to Put Heat Exchanger in Service
1420 - 1430	Recap
1430	Lunch & End of Day Two





















Day 3:: Wednesday, 05th of November 2025

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0730 – 0915	Fired Heaters Type of Furnaces • Major Parts of a Horizontal Furnace • Major Parts of a
	Vertical Furnace • Fire Box • Shock Tubes • Radiant Cone
0915 - 0930	Break
0930 – 1030	Fired Heaters (cont'd)
	Convection Section • Stack Temperature • Causes of High Stack
	Temperature • Flue Gas Composition • Burners • Effect of Excess Air on
	Combustion
	Fired Heaters (cont'd)
1030 – 1200	Fuel - Air Ratio • Types of Burners • Gas Burner Construction • Draft
	Inside Gas Burner • Pre-Mix Gas Burner • Non-Pre-Mix Gas Burner
1200 – 1215	Break
	Fired Heaters (cont'd)
1215 – 1420	Properties of Gas Burner • Draft Inside Gas Burner • Flash Back • Fuel Oil
	Burner • Steam - Air Atomising Burner • Combination Burner • Pilot
	Burner • Burner Management System
1420 – 1430	Recap
	Using this Course Overview, the Instructor(s) will Brief Participants about the
	Topics that were Discussed Today & Advise Them of the Topics to be
	Discussed Tomorrow
1430	Lunch & End of Day Three

Day 4: Thursday, 06th of November 2025

Day 4:	Inursday, vo of November 2025
0730 - 0915	Fired Heaters (cont'd)
	Combustion Process • Fuel & its Flame Colour • Combustion Losses •
	Ignition Temperature
0915 - 0930	Break
0930 - 1030	Fired Heaters (cont'd)
	Flame Temperature • Excess Air • Combustion Control • NOX Burner
1030 – 1200	Fired Heaters (cont'd)
	NOX Formation • Furnace Operation • Furnace Draft • Coking
1200 – 1215	Break
1215 – 1420	Fired Heaters (cont'd)
	Ignition • Furnace Operation • High Pressure Fir - Box Furnace • Furnace
	Tube Life
1420 – 1430	Recap
	Using this Course Overview, the Instructor(s) will Brief Participants about the
	Topics that were Discussed Today & Advise Them of the Topics to be
	Discussed Tomorrow
1430	Lunch & End of Day Four

Day 5: Friday, 07th of November 2025

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0730 – 0915	Fired Heaters (cont'd)
	Furnace Start Up • Maximum Skin Temperature • Flame Distribution •
	Balance of Flow • Pre-Start Up • Ignition of Burner Under Pressure •
	Furnace Shut Down
0915 - 0930	Break
0930 – 1100	Fired Heaters (cont'd)
	Furnace Heat - Off • Furnace Emergency Shut Down • Action in the Event
	of Tube Rupture • Minor Tube Leak • Furnace Typical Operating Problems
	• Effect of Reduced Air • Absolute Combustion

















1100 – 1200	Fired Heaters (cont'd) Oxygen Starvation • Fir Box & Flame Appearance • Secondary Combustion • Furnace Troubleshooting • Loss of Flame • Flame Control • Heater Tube Failure
1200 – 1215	Break
1215 – 1345	Fired Heaters (cont'd) High Temperature Creep • Purge Steam • Identifying Thin Tube & Hot Spot • Tube Fire Side Heater • Furnace Explosion • Flame Temperature • Flame Stability • Combustion
1345 - 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

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