

COURSE OVERVIEW PE0459 Thermal Cracking Process

Course Title

Thermal Cracking Process

Course Date/Venue

Session 1: June 07-11, 2026/Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE

Session 2: September 13-17, 2026/Meeting Plus 9, City Centre Rotana, Doha, Qatar



Course Reference

PE0459

Course Duration/Credits

Five days/3.0 CEUs/30 PDHs

Course Description



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



This course is designed to provide participants with a detailed and up-to-date overview of Thermal Cracking Process. It covers the basics of thermal conversion and thermal cracking processes; the differences between visbreaking, distillate cracking and thermal gasoil units; the configuration and arrangement of thermal conversion units including flow diagrams and process line-ups; the yields and properties of TC-products and equipment; operating the principles of thermal conversion units; the techniques for monitoring thermal conversion units (TCUs); and implementing start-up and shut-down procedures for thermal conversion units.



During this interactive course, participants will learn the decoking processes, troubleshooting techniques and HSE and emergency procedures; designing and operating thermal conversion furnaces, analyzing real-world issues and developing solutions; the properties of feed residue and their impact on processing; the stability theory and its application in thermal conversion; the principles of fuel oil blending and economic analysis of thermal conversion processes; the thermal conversion processes, process flow diagrams and mass balances; the equipment constraints and optimization, economic considerations, fuel oil blending and economics, unit decokes and maintenance; the detailed procedures for decoking units and root causes of issues; and developing practical solutions.

Course Objectives

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

- Apply and gain an in-depth knowledge on thermal cracking process
- Discuss the basics of thermal conversion and thermal cracking processes
- Identify the differences between visbreaking, distillate cracking and thermal gasoil units
- Carryout configuration and arrangement of thermal conversion units including flow diagrams and process line-ups
- Explain the yields and properties of TC-products and equipment as well as operate the principles of thermal conversion units
- Apply techniques for monitoring thermal conversion units (TCUs) as well as implement start-up and shut-down procedures for thermal conversion units
- Employ decoking processes, troubleshooting techniques and HSE and emergency procedures
- Design and operate thermal conversion furnaces, analyze real-world issues and develop solutions
- Explain the properties of feed residue and their impact on processing as well as the stability theory and its application in thermal conversion
- Identify the principles of fuel oil blending and employ economic analysis of thermal conversion processes
- Analyze thermal conversion processes, process flow diagrams and mass balances
- Discuss equipment constraints and optimization, economic considerations, fuel oil blending and economics, unit decokes and maintenance and detailed procedures for decoking units
- Identify root causes of issues and develop practical solutions

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 thermal cracking process for chemical engineers, process engineers, petroleum engineers, industrial chemists, plant operators and technicians, technical managers and supervisors.

Course Fee


Dubai	US\$ 7,500 per Delegate + VAT . This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Doha	US\$ 7,500 per Delegate. 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

Haward's certificates are accredited by the following international accreditation organizations:

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British Accreditation Council (BAC)

Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. Haward's certificates are internationally recognized and accredited by the British Accreditation Council (BAC). 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.

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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. Henry Beer is a **Senior Process Engineer** with over **30 years** of indepth industrial experience within the **Petrochemical, Oil & Gas** industries specializing in **Hydrocarbon Process Equipment, DOX Unit Operation & Troubleshooting, Polyethylene & Polypropylene Processing, Oil Movement Storage & Troubleshooting, Power Plant Chemistry, Fuel Quality Monitoring System Fundamentals, Liquid Bulk Cargo Handling, Oil Refinery Cost Management, Flare & Blowdown Operation, Pressure Relief Systems Maintenance & Troubleshooting, Refinery SRU, Tail Gas Treating, Sour Water & Amine Recovery Units, Propylene Compressor and Turbine, Clean Fuel Technology & Standards, Principles of Operations Planning, Heat Exchangers & Fired Heaters Operation & Troubleshooting, Plastic Extrusion Technology Operation & Troubleshooting, Chemical Engineering for Non-Chemical Engineers, Process Plant Troubleshooting, Process Plant Optimization Technology, Engineering Problem Solving, Process Plant Performance & Efficiency, Process Plant Start-up & Shutdown, Process Plant Commissioning, Process Plant Turn-around & Shutdown, Pumps & Compressors Troubleshooting, Fired Heaters & Air Coolers Maintenance, Pressure Vessels & Valves Repair, Polymers, Plastics, Polyolefin & Catalysts, Polymerization, Thermal Analysis Techniques, Rheology, Thermoplastics, Thermosets, Coating Systems and Fibre Reinforced Polymer Matrix Composites. Further, he is also well-versed in **Water Hydraulic Modelling, Efficient Shutdowns, Turnaround & Outages, Pump Selection and Installation, Operation and Maintenance of Pumps, Demand & Supply Management, Catalyst Manufacturing Techniques, Fuel Systems Management, Aviation Fuel, Diesel, Jet Fuel, Petrol and IP Octane, Cetane Control** and related Logistics, Road, Rail and Pipeline Distribution, **Process Design and Optimisation, Boiler Feed Water Preparation, Flocculation Sedimentation, Hot Lime Water Softening Processes, Desalination Processes, Reverse Osmosis, Molecular Sieves, activated Sludge Aerobic/Anaerobic, Sludge Removal and Incineration Process Control, Domestic Sewage Plants Optimisation, Process Cooling Water System, High Pressure and Low Pressure Tank Farm Management, Hydrocarbon and Chemical products and GTL (Gas to Liquids).****

During his career life, Mr. Beer holds significant key positions such as the **Director, Global Commissioning Manager, Process Engineering Manager, Senior Business Analyst, Process Engineer, Chemical Engineer, Senior Technician, Technical Sales Engineer, Entrepreneur, Financial Consultant, Business Analyst, Business Financial Planner and Independent Financial Planner** to various international companies such as the **Sasol, SASOLChem, TAG Solvents, Virgin Solvent Products, SARS & SAPIA (South African Petroleum Industry Association)** and **RFS Financial Services (Pty) Ltd.**

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 workshop 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	Basics of Thermal Conversion Introduction to Thermal Cracking Processes • Differences Between Visbreaking, Distillate Cracking, & Thermal Gasoil Units • Overview of Process Chemistry & Reactions
0930 – 0945	Break
0945 – 1030	Line-Ups of Thermal Conversion Units Configuration & Arrangement of Thermal Conversion Units • Flow Diagrams & Process Line-Ups • Key Components & Their Functions
1030 – 1130	Yields & Properties of TC-Products Yields of Various Thermal Cracking Products • Properties & Characteristics of Products • Factors Influencing Product Yields & Properties
1130 – 1215	Exercise 1: Analyzing TC-Product Yields Practical Exercise on Calculating & Analyzing Product Yields • Group Discussions & Problem-Solving
1215 – 1230	Break
1230 – 1330	TC-Equipment Overview of Thermal Conversion Equipment • Design & Operation of Key Equipment • Maintenance & Troubleshooting of TC-Equipment
1330 – 1420	Unit Operation & Control Operating Principles of Thermal Conversion Units • Control Systems & Instrumentation • Best Practices for Efficient Operation
1420 – 1430	Recap
1430	Lunch & End of Day One



Day 2

0730 – 0830	Monitoring of TCUs <i>Techniques for Monitoring Thermal Conversion Units • Key Performance Indicators & Parameters • Data Analysis & Interpretation</i>
0830 – 0930	Start-Up & Shut-Down Procedures <i>Detailed Procedures for Starting Up Thermal Conversion Units • Shut-Down Protocols & Safety Measures • Case Studies on Start-Up & Shut-Down Scenarios</i>
0930 – 0945	Break
0945 – 1100	Decoking Processes <i>Importance of Decoking in Thermal Conversion Units • Decoking Methods & Techniques • Scheduling & Planning for Decoking Operations</i>
1100 – 1215	Exercise 2: Troubleshooting TCUs <i>Practical Exercise on Troubleshooting Common Issues • Group Discussions & Problem-Solving</i>
1215 – 1230	Break
1230 – 1330	Troubleshooting Techniques <i>Identifying & Diagnosing Operational Problems • Root Cause Analysis & Corrective Actions • Tools & Techniques for Effective Troubleshooting</i>
1330 – 1420	HSE & Emergency Procedures <i>Health, Safety & Environmental Considerations • Emergency Response Planning & Drills • Best Practices for Ensuring Safe Operations</i>
1420 – 1430	Recap
1430	Lunch & End of Day Two

Day 3

0730 – 0830	Thermal Conversion Furnaces <i>Design & Operation of Thermal Conversion Furnaces • Heat Transfer & Combustion in Furnaces • Maintenance & Optimization of Furnace Performance</i>
0830 – 0930	Exercise 3: Furnace Performance Analysis <i>Practical Exercise on Analyzing Furnace Performance • Group Discussions & Problem-Solving</i>
0930 – 0945	Break
0945 – 1100	TC Open Clinic <i>Interactive Session for Discussing Specific Challenges • Analyzing Real-World Issues & Developing Solutions • Sharing Experiences & Best Practices</i>
1100 – 1215	Feed Residue & Product Stability <i>Properties of Feed Residue & their Impact on Processing • Stability Theory & Its Application in Thermal Conversion • Techniques for Improving Product Stability</i>
1215 – 1230	Break
1230 – 1330	Fuel Oil Blending <i>Principles of Fuel Oil Blending • Factors Influencing Blending Quality • Economic Considerations in Fuel Oil Blending</i>
1330 – 1420	Process Economics <i>Economic Analysis of Thermal Conversion Processes • Cost-Benefit Analysis & Optimization • Case Studies on Process Economics</i>
1420 – 1430	Recap
1430	Lunch & End of Day Three



Day 4

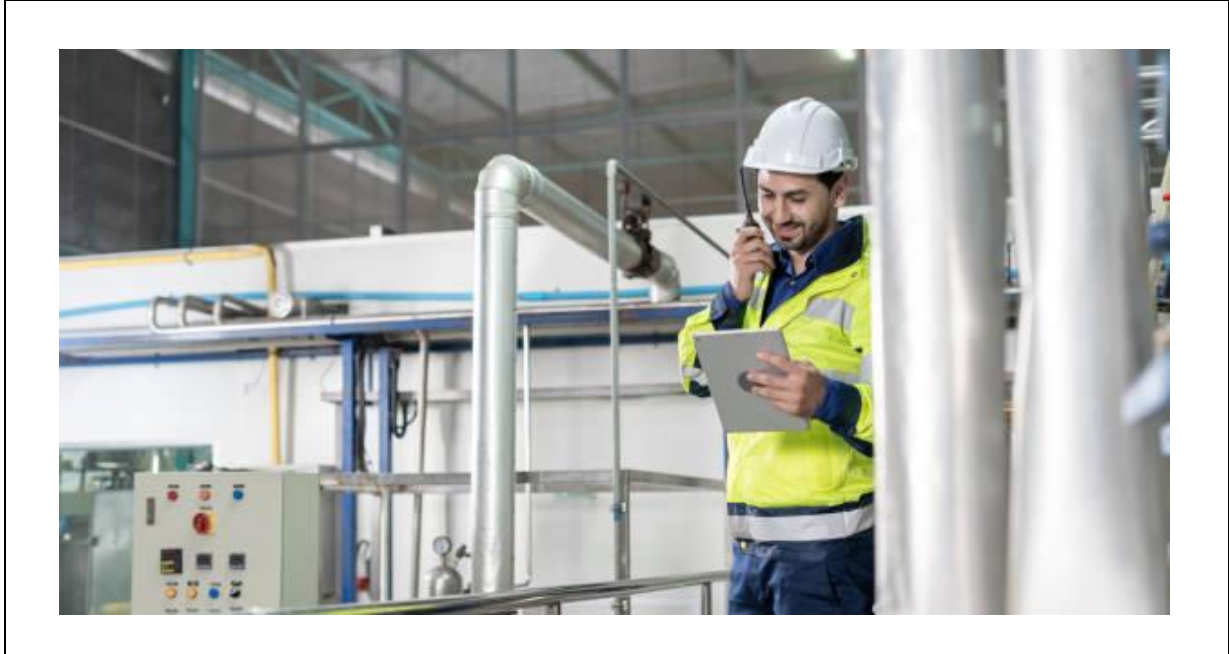
0730 – 0830	Detailed Process Analysis In-Depth Analysis of Thermal Conversion Processes • Process Flow Diagrams & Mass Balances • Key Operational Parameters & their Impact
0830 – 0930	Equipment Constraints & Optimization Understanding Equipment Limitations • Techniques for Optimizing Equipment Performance • Case Studies on Overcoming Constraints
0930 – 0945	Break
0945 – 1100	Economic Considerations Cost Factors in Thermal Conversion • Strategies for Reducing Operational Costs • Economic Evaluation of Process Improvements
1100 – 1215	Fuel Oil Blending & Economics Advanced Blending Techniques • Impact of Blending on Product Quality & Economics • Practical Exercises on Fuel Oil Blending
1215 – 1230	Break
1230 – 1330	Unit Decokes & Maintenance Detailed Procedures for Decoking Units • Scheduling & Planning for Maintenance • Best Practices for Maintaining Unit Efficiency
1330 – 1420	Review & Preparation for Clinic Workshop Review of Key Concepts & Topics • Preparation for the Clinic Workshop • Q&A Session for Clarifying Doubts
1420 – 1430	Recap
1430	Lunch & End of Day Four

Day 5

0730 – 0930	Clinic Workshop Objectives & Structure of the Workshop • Overview of Issues to be Discussed
0930 – 0945	Break
0945 – 1100	Case Studies & Real-World Challenges Presentation of Case Studies by Participants • Analysis & Discussion of Real-World Challenges • Group Brainstorming & Problem-Solving
1100 – 1230	Developing Solutions & Best Practices Identifying Root Causes of Issues • Developing Practical Solutions • Sharing Best Practices & Experiences
1230 – 1245	Break
1245 – 1345	Feedback & Evaluation Review of Workshop Outcomes • Participant Feedback & Evaluation • Discussion on Future Improvements & Training Needs
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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