COURSE OVERVIEW TE0039
Desalination & Mixed Bed

Course Title
Desalination & Mixed Bed

Course Date/Venue
Session 1: June 22-26, 2025/Boardroom 1,
Elite Byblos Hotel Al Barsha,
Sheikh Zayed Road, Dubai, UAE
Session 2: November 17-21, 2025/Fujairah
Meeting Room, Grand Millennium
Al Wahda Hotel,
Abu Dhabi, UAE

Course Reference
TE0039

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

Course Description

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

This course is designed to provide participants with a detailed and an up-to-date overview of desalination and mixed bed. It covers the water contamination, water chemistry units and corrosive properties of water; the scale formation, pre-treatment requirements of ion exchange, jon exchange treatment and mixed bed deminelization; the ion exchange resins covering synthesis, types, water of hydration and commercial equivalents; and the ion exchange softening, purpose and comparison of ion exchange dealkalizers, decarbonators and degassifiers.

During this interactive course, participants will learn the condensate polishing, two-bed demineralization and mixed beds; troubleshooting demineralizers, resin testing, vessel inspection, sample procurement, interpretation of resin analysis and decision to clean or replace; the pre-treatment for corrosion control; the requirements for different boilers; and the oxygen control and the various types of deaerators including deaeration operating sequences and temperature guidelines.

Course Objectives

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

- Apply and gain an in-depth knowledge on desalination and mixed bed
- Discuss water desalination and mixed bed covering water contamination, water chemistry units and corrosive properties of water
- Illustrate scale formation, pre-treatment requirements of ion exchange, jon exchange treatment and mixed bed deminelization
- Identify ion exchange resins covering synthesis, types, water of hydration and commercial equivalents
- Recognize ion exchange softening and the purpose and comparison of ion exchange dealkalizers, decarbonators and degassifiers
- Describe condensate polishing, two-bed demineralization and mixed beds
- Troubleshoot demineralizers and apply resin testing, vessel inspection, sample procurement, interpretation of resin analysis and decision to clean or replace
- Carryout pre-treatment for corrosion control and discuss the requirements for different boilers
- Apply oxygen control and identify the various types of deaerators including deaeration operating sequences and temperature guidelines

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 desalination and mixed bed for utility superintendents, power house supervisors and plant engineers. Further, foremen/women and shift supervisors will also gain job enrichment by understanding the importance of water treatment equipment, early detection of problems and operator training techniques. Those in a design capacity at architect-engineering firms will find merit in the review of the technology. At the corporate level, this course provides a comprehensive update for company water consultants or engineering review committee members. The course is especially valuable for engineers working on plant expansions, since technology trends are reviewed. Special emphasis has been added on cogeneration and combined cycle systems. Moreover, R&D, laboratory and corrosion professionals will highly benefit from this course.

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 Certificate(s)

Internationally recognized certificates will be issued to all participants of the course 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. Adel Abdallah is a **Senior Water Engineer** with almost **25 years** of extensive experience within the **Power & Water Utilities** and **other Energy** sectors. His expertise widely covers in the areas of **Municipal Wastewater Treatment** Facility Operation, **Water Network Design & Hydraulic Modelling**, **Water Utility Industry**, **Sewage & Industrial Waste Water Treatment**, **Water Reservoir**, **Water Storage Reservoir**, **Water Reservoirs & Pumping Stations**, **Water Pumping Station**, **Water Distribution Systems & Pumping Stations**, **Reservoirs & Pumping Stations** Design & Operation, **Pumping** Systems, Interconnecting Pipelines, **Pump** Houses & Booster Pumping Stations, **Water Pipes & Fittings**, **Water Hydraulic** Modelling, **Water Network Hydraulic** Simulation Modelling, **Water Balance** Modelling, **Water Pipelines** Materials & Fittings, **Water Distribution** System, **Water Distribution Network**, **Water Network** System Design, **Water Instrumentation** and Network Control, **Initiation to Water Networks** Components, **Water Network System** Analysis, **Water Network** System Extension, **Water Network** System Replacement & Upgrade, **Water Networks** Optimization, **Water Tanks**, **Water Forecasts** Demand, **Waste Water Effluent Treating** Facilities, **Effluent Treatment & Slurry Handling**, **Oily Water Treatment Technology**, **Water Equipment** Selection & Inspection, **Water Testing & Commissioning** Techniques, **Wastewater** Treatment, **Water Supply** Design, Qualitative Analysis of Soil & **Ground Water**, **Well inventory**, **Monitoring & Conservation**, **Potable Water** Transmission, Districts Meters Areas (**DMA**s), **Water Supply & Desalination** Plants Rehabilitation, **Water Supply & Distribution Systems** Efficiency & Effectiveness, **Water Instrumentations** Basics, **Water Treatment** Technology, **Reverse Osmosis**, **MSF Plants**, Extended Activated **Sludge Treatment**, **MBBR**, **Water Quality** Analysis, **Steam Boiler**, **Hydro-Treating Technology** and **Water Storage Tanks**.

During Mr. Abdallah's career life, he has handled challenging positions wherein he has acquired his wide technical and practical experience such as the **Water Engineer**, **Project Site Engineer**, **Water & Wastewater Treatment System Plant Engineer**, **Senior Water & Wastewater Plant Engineer**, **Production Supervisor**, **Process Engineer**, **Technical Engineer**, **Chemical Engineer** and **Senior Instructor/Consultant** for various companies such as the Water Authority of Jordan, Metito Overseas, Al-Hassan Industrial Estate, UIP-FCEC JV Design and Build Company, Degussa MBT, Al-Mas Resin Factory, Jordanian Tunisian Chemicals Co. and National Chlorine Company.

Mr. Abdallah has a **Bachelor's** degree in **Chemical Engineering**. Further, he is a **Certified Instructor/Trainer** and delivered numerous courses, trainings, conferences, seminars 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.

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 Water Desalination & Mixed Bed*** *Water Contamination ● Water Chemistry Units ● Corrosive Properties of Water ● Scale Formation ● Pre-Treatment Requirements of Ion Exchange ● Jon Exchange Treatment ● Mixed Bed Deminelization*
0930 – 0945	*Break*
1100 – 1230	***Ion Exchange Resins*** *Synthesis ● Types*
1230 – 1245	*Break*
1245 - 1345	***Ion Exchange Resins (cont'd)*** *Water of Hydration ● Commercial Equivalents*
1345 – 1420	***Ion Exchange Softening*** *Equipment ● Service and Regeneration Reactions ● Troubleshooting*
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 – 0930	***Ion Exchange Dealkalizers*** *Purpose & Comparison*
0930 – 0945	*Break*
0945 – 1230	***Decarbonators & Degassifiers*** *Purpose & Comparison*
1230 – 1245	*Break*
1245 – 1345	***Condensate Polishing*** *Powdered Resin Units*
1345 - 1420	***Condensate Polishing (cont'd)*** *Magnetic Filtration*
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 – 0930	***Two-Bed Demineralization*** *Equipment ● Service & Regeneration Reactions ● Performance Expectations ● Exhaustion Profiles ● Distributor Design ● Regenerant Dilution Systems*
0930 – 0945	*Break*
0945 – 1230	***Mixed Beds*** *Makeup Mixed Beds ● Condensate Mixed Beds ● Performance Expectations*
1230 – 1245	*Break*

1245 - 1345	***Mixed Beds (cont'd)*** *Regeneration Protocols ● Three Component Systems ● Uniform Particle Size Resins*
1345 – 1420	***Troubleshooting Demineralizers*** *Short Run ● Poor Water Quality ● Resin Problems*
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 4

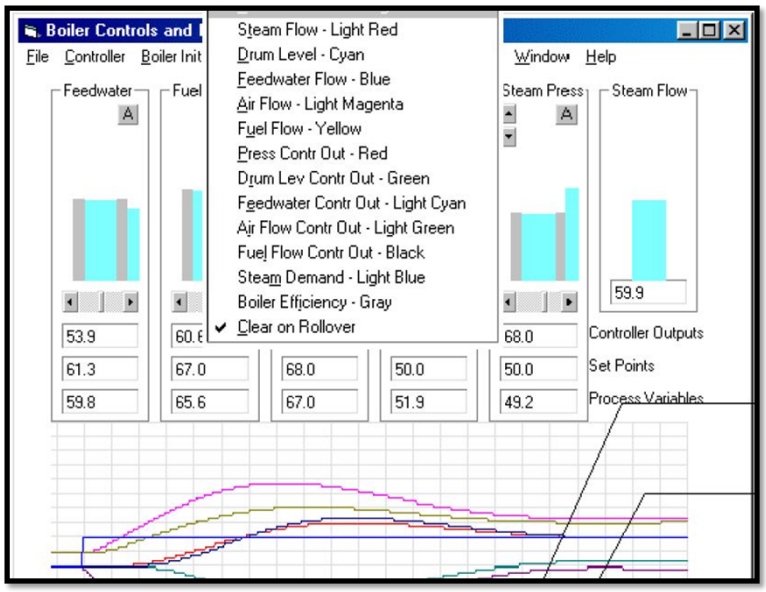
0730 – 0930	***Resin Testing*** *Vessel Inspection ● Sample Procurement*
0930 – 0945	*Break*
0945 – 1230	***Resin Testing (cont'd)*** *Interpretation of Resin Analysis*
1230 – 1245	*Break*
1245 - 1345	***Resin Testing (cont'd)*** *Decision to Clean or Replace*
1345 – 1420	***Pre-Treatment for Corrosion Control*** *Requirements for Different Boilers*
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 5

0730 – 0930	***Oxygen Control*** *Deaeration ● Types of Deaerators*
0930 – 0945	*Break*
0945 – 1230	***Deaeration*** *Operating Sequences ● Problems*
1230 – 1245	*Break*
1245 - 1300	***Deaeration (cont'd)*** *Problems*
1300 – 1345	***Deaeration (cont'd)*** *Temperature Guidelines*
1345 – 1400	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Simulator (Practical Sessions)

Practical session will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using the simulator "Win Boiler Sim".



Win Boiler Sim

Course Coordinator

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