BLACKBIRD FOR TRAINING

Plate Heat Exchangers: Design, Performance, and Maintenance

21 – 25 March 2027
Dubai (UAE)



Plate Heat Exchangers: Design, Performance, and Maintenance

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Introduction

Plate heat exchangers are among the most widely used technologies for heat transfer in various industrial sectors, including refrigeration, HVAC, chemical processing, food and beverage, and energy. Due to their high efficiency, compact size, and ease of maintenance, they have become the preferred solution for many industrial applications.

This theoretical course is designed to equip participants with a mechanical background with a comprehensive understanding of the design, operation, and maintenance principles of plate heat exchangers. The course enables them to evaluate performance, identify common issues, and interpret technical manuals and system diagrams effectively.

Course Objectives

By the end of this course, participants will be able to:

- Understand the working principles and different types of plate heat exchangers.
- Identify industrial applications for various types of plate heat exchangers.
- Grasp key thermal and hydraulic performance concepts.
- Become familiar with commonly used materials and quality standards.
- Develop skills in reading technical datasheets and installation diagrams.
- Recognize common failures and understand basic maintenance principles.
- Gain insight into the latest technologies and trends in the field.

Course Outlines

Day 1: Introduction & Components of Plate Heat Exchangers

- Introduction to heat exchangers and their main types
- Working principle of plate heat exchangers
- Key components plates, gaskets, frame
- Comparison between plate and shell-and-tube heat exchangers



Day 2: Types of Plate Heat Exchangers & Applications

- Gasketed, brazed, and welded plate heat exchangers
- Flow configurations within plate heat exchangers
- Industrial applications HVAC, food & beverage, energy, oil & gas
- Criteria for selecting the suitable type for each application

Day 3: Thermal & Hydraulic Performance

- Log Mean Temperature Difference LMTD and its role
- Causes and implications of pressure drop
- Effect of plate design on thermal efficiency and fluid dynamics
- Fouling: causes, impact, and prevention

Day 4: Materials, Standards & Maintenance

- Common materials used and their selection criteria
- Corrosion types in plate heat exchangers
- Relevant industry standards ASME, ISO, TEMA
- Common failures and inspection techniques

Day 5: Installation, Operation & Modern Technologies

- Installation steps and safe startup procedures
- Reading datasheets, technical manuals, and nameplates
- Cleaning, maintenance, and part replacement schedules
- Modern innovations smart systems, digital monitoring, energy-efficient designs

Why Attend this Course: Wins & Losses!

- Master plate heat exchanger selection and design — or risk implementing inefficient and oversized systems.
- Understand failure modes and preventive maintenance — or face unexpected breakdowns and operational downtime.
- Learn how to evaluate thermal and hydraulic performance — or continue to rely on guesswork in sizing and troubleshooting.
- Read and interpret technical manuals and standards with confidence — or struggle to implement OEM recommendations.
- Keep up with the latest technologies and digital innovations — or miss opportunities to enhance energy efficiency and reliability.



Conclusion

This course provides mechanical professionals with essential knowledge and practical understanding of plate heat exchangers. With a solid foundation in design, performance evaluation, failure diagnosis, and modern technologies, participants will be better prepared to optimize systems, ensure reliability, and support long-term operational excellence across industrial applications.

