

# € TRAINING

Heat Exchanger Essentials





# Heat Exchanger Essentials

## Introduction:

This training program will feature the importance and relevance of the important and expensive items of equipment known as heat exchangers that are used in a wide variety of industries. It will familiarise engineers and technicians with the various standards and practices used for the design, manufacture, operation, and maintenance of heat exchangers.

## Program Objectives:

At the end of this program, participants will be able to:

- Understand heat transfer fundamentals.
- Analyze exchanger operational parameters.
- Determine correct troubleshooting techniques.
- Determine the correct selection criteria for heat exchangers.
- Troubleshoot exchange problems.

## Targeted Audience:

- Maintenance Professionals.
- Inspection Personnel.
- Process Supervisors.
- Plant Operators.
- Plant/Technical Managers.

## Program Outlines:

### Unit 1:

#### Types and Applications of Heat Exchangers:

- Overview and Basic Fundamentals.
- Heat Transfer Fundamentals and Heat Transfer Coefficients.

- Heat Exchanger Types and Application
- Geometry Of Shell & Tube Heat Exchangers STHE.
- Double Pipes TEMA Nomenclature, Front End Head Types, Shell Types.
- Rear End Types, Double Pipe Units, Selection Guidelines.

## Unit 2:

### Thermal and Hydraulic Design of Heat Exchangers:

- Sizing and Specifying the Heat Exchanger .
- Flow vs. Temperature Difference in STHE.
- Temperature Difference in STHE.
- Condensers and Reboilers.

## Unit 3:

### Mechanical Design of Heat Exchangers:

- Mechanical Design Of Heat Exchangers.
- Basic Design Of Heat Exchangers.
- Special Design Considerations.
- Piping Loads on Exchanger Nozzles.
- Materials of Construction On Heat Exchangers.
- Fabrication of Heat Exchangers.

## Unit 4:

### Operation and Maintenance of Heat Exchangers:

- Fouling in Heat Exchangers.
- Corrosion and Erosion in Heat Exchangers.
- Heat Exchanger Inspection Methods.
- Operation and Troubleshooting.
- Performance Monitoring and Testing.

- Cost-Effective Maintenance and Repair of Heat Exchangers.

## Unit 5:

### Performance Enhancement and Optimisation of Heat Exchangers:

- Heat Transfer Augmentation Techniques.
- Finned Tubes.
- Heat Integration Basics.
- Pinch Technology.
- Heat Exchanger Train Optimisation.
- Tube Bundle Replacement - Alternative Enhanced Tube Bundle Designs.