

Training - Thermal Equipment



MATHER-EN-P



Face-to-face only



4 days

This course provides in-depth knowledge of heat exchangers, furnaces and boilers installed in the Oil & Gas industry

Level

Knowledge

Public

Engineers, technical staff and supervisors involved in the technology and operation of thermal equipment

Objectives

Attendees will be able to implement the following skills:

- Describe heat exchange laws and identify key parameters impacting exchange coefficients and pressure drops
- Select a type of exchanger construction with full knowledge of the advantages and disadvantages
- Explain the impact of operating conditions on furnace and boiler performance
- Identify the optimization parameters of a combustion plant and explain the operation of the main control loops

Pedagogical & technical resources

- Study of main components of burners, tube coils and refractory
- Actual examples and applications from the refining, petrochemical and chemical industry
- Trainee participation is continuously encouraged through the use of case studies selected by the trainees themselves

Assessment of achievements

- Trainees are assessed throughout the training through practical application phases and interactions with the trainer
- A final on-the-spot evaluation may also be carried out at the end of the course and/or at the end of each module using tests designed to verify the learners' understanding and assimilation of the knowledge linked to the training objectives

Prerequisites

No prerequisites are necessary to follow this course

Responsible

IFP Training instructors, with expertise in the field and trained in modern teaching methods adapted to the specific needs of learners from the professional world

Program

THERMAL EQUIPMENT & HEAT TRANSFER

0.5 day

Heat exchange conditions: convection coefficients, resistance caused by the walls and/or fouling. Overall heat

transfer coefficient.

Heat transfer by radiation: parameters influencing heat transfer, type of fuel burned, tube temperature, fouling consequence.

HEAT EXCHANGERS TECHNOLOGY & SELECTION CRITERIA

1 day

TEMA standard heat exchangers, selection criteria for different types of shell, front ends and rear ends, floating end construction.

Tubes: length, diameter and gage, pattern and pitch, tube-to-tube sheet connection.

Baffles and support plates: type of transversal baffles, baffles cut, spacing.

Thermal performance: fluid flow distribution, geometrical characteristics and technological constraints.

Other types of heat exchanger: tubular or plate type, air coolers and condensers. Maintenance and cleaning.

HEAT EXCHANGERS PERFORMANCE & MAINTENANCE

0.75 day

Heat exchanger performance follow-up: influence of fouling.

Inspection of exchanger bundles. Hydraulic pressure test: case of U tube bundle and floating head heat exchangers.

FURNACES & BOILERS TECHNOLOGY

1.25 days

Different types of furnaces and their features. Operating conditions.

Boiler technology and operating conditions.

Efficiency of heat recovery: estimation rule. Parameters influencing heater efficiency.

Construction of heat exchange areas and refractory materials.

Air and flue gas circulation: natural and forced draft.

Burner technology: fuel and air supply and mixture. Low NOx and ultra-low NOx burners technology.

HEATERS OPERATION

0.5 day

On stream operation: monitoring of combustion and heating. Modifying operating conditions.

Control system: air/fuel ratio control, process fluid outlet temperature, steam pressure, feed water flow rate control, phenomena disrupting the steam drum level. Safety prescriptions on heaters, process fluid, combustion, fuel circuits.

Safe and reliable operation: main recommendations. Start-up and shutdown: preparation, safe ignition procedures.

To French entities : IFP Training is referenced to DataDock ; you may contact your OPCO about potential funding.

Please contact our disabled persons referent to check the accessibility of this training program : referent.handicap@ifptraining.com