

HEAT TRANSFER APPLICATIONS OF INDUSTRIAL PROCESS

November 18 - 22, 2018

Dubai , UAE

Early Bird Discount & Registration

Register and pay 25 days prior to the event date and get 15% discount.
Registrations will close 15 days prior to the start of the Course.

Course Overview:

Process industry optimal operation is dependent on the continuous proper performance of the heating and cooling systems. Any problems and deterioration in such utilities affect the main process and thus the profits of the company.

In addition, the correct selection of the thermal equipment appropriate with the process ensures minimal troubleshooting and downtime. Equipment like furnaces and boilers use combustion of fuel to transfer the energy in the fuel to the process fluid or generate steam for different applications.

Heat exchangers and cooling towers transfer heat from or to process fluid or dump heat to the environment. In many cases these heating processes are inefficient with large amount of energy being wasted. All intensified energy consuming industry can benefit substantially by reviewing heat transfer processes and maximizing their potential saving. Lastly, Pinch technology optimize steam heating and water cooling requirements and thus reduce fuel cost

Course Objectives:

After completing this course, participants will be able to:

- ◆ To analyze actual systems involving multiple modes of heat transfer
- ◆ To calculate heat flux and the temperature gradient through a wall due to steady-state conduction heat transfer.
- ◆ To Calculate heat loss from a surface due to convection and radiation heat transfer
- ◆ To increase awareness on heat transfer in smelting furnaces.
- ◆ To illustrate how heat transfer could be modeled in a smelting furnace refractory and how different lining thickness could be estimated.
- ◆ To increase awareness on process heating by burners used in melting, drying and steam generation.
- ◆ To assess the performance heat transfer systems
- ◆ To understand the concept and types of heat exchangers.
- ◆ To increase awareness on heat recovery systems and methods of maximizing heat gain.

Who Should Attend?

This course is designed for Process Technician, Process Engineers, Supervisors and Operating Personnel

Course Language:

The Presentation, supplied documents, and workshop exercises of the course are in **English** however, based on the trainees' desires, oral presentation or discussion can be **Bilingual** (English and Arabic).

Course Contents:

Module 1 : Heat transfer fundamentals:

- 1.1 Heat transfer rate and Heat flux
- 1.2 Changes of phase (evaporation and condensation)
- 1.3 Heat Transfer Modes, Conduction, Convection, and Radiation.
- 1.4 Fourier law of conduction
- 1.5 Introduction to Convection, External Flow and Internal Flow
- 1.6 Laminar and Turbulent flow
- 1.7 Heat Transfer Coefficient

Module 2: Radiation Heat Transfer

- 2.1 Introduction and thermal radiation Properties
- 2.2 Total Emissive power and Stefan – Boltzman law
- 2.3 Blackbody radiation .
- 2.4 Thermal radiation Emitted from Real Surfaces
- 2.5 Thermal Radiation properties of gases
- 2.6 Radiation shape factor

Module 3: Heat losses from surfaces .

- 3.1 Composite wall heat conduction.
- 3.2 Combined conduction and convection.
- 3.3 Combined convection and Radiation.
- 3.4 Freeze lining, Refractory, Graphite, Steel , Shell cooling
- 3.5 Conductivity of insulating materials
- 3.6 **Case study 1:** Application of heat losses from a smelting furnace to estimate the thickness of a freeze lining on the hot face.
- 3.7 **Case study 2:** Heat losses from an insulated and un-insulated steam piping

Module 4 : Burners

- 4.1 Combustion basics and flame temperature
- 4.2 Gross fuel heat input, Net fuel heat input, Available heat, Flue gas heat losses, Wall heat loss
- 4.3 Types of Burners.
- 4.4 Comparison between Natural & Forced Draft burners.
- 4.5 Heat losses and excess air optimization
- 4.6 Combustion efficiency of the burner as a function of exhaust temperature

Module 5: Heat exchangers

- 5.1 Flow arrangements in heat exchangers
- 5.2 Heat duty of a heat exchanger
- 5.3 Effectiveness of heat exchangers versus Number of transfer units
- 5.4 Different types of fouling.
- 5.5 Fouling resistance for different fluids
- 5.6 Effect of fouling in heat duty.
- 5.7 Overall Heat Transfer Coefficients.
- 5.8 Performance of heat exchangers.
- 5.9 Deterioration of equipment and its effect on Performance

Module 6 : Regenerative heat Exchangers

- 6.1 Double tube heat exchanger
- 6.2 Shell and tube heat exchanger
- 6.3 Selection of Types of Shell and Tube Heat exchangers
- 6.4 Modified Advance shell and tube "Helixchanger"
- 6.5 Hairpin Heat Exchangers
- 6.6 When To Use Fin-tube Hairpin Heat Exchangers.
- 6.7 Plate Type heat exchangers.
- 6.8 Comparison between shell and tube and plate type heat exchangers
- 6.9 Spiral Heat exchangers
- 6.10 Fin Fan Air coolers

Module 7 : Direct contact heat exchangers

- 7.1 Evaporative cooling mechanism in cooling Towers
- 7.2 Types of cooling towers
- 7.3 Components of cooling towers

Module 8 : Process heater

- 8.1 Classification of Process heaters
- 8.2 Parts of Process heaters
- 8.3 Heat Transfer In Process heaters and Efficiency.
- 8.4 Heat recovery in Process heaters.

Module 9 : Process Heat Integration in Industry

- 9.1 Basic concepts of pinch technology
- 9.2 Temperature-heat load of heat recovery scheme
- 9.3 The Pinch Principle
- 9.4 Rules of minimum energy targets
- 9.5 Stream networks
- 9.6 Design of Energy Recovery Systems
- 9.7 Energy design chart
- 9.8 Heat exchangers at the Pinch
- 9.9 Incorrect design below the Pinch.
- 9.10 Heat recovery circuit.
- 9.11 Selection of Pinch Temperature Difference.
- 9.12 Adjusted temperature intervals and stream data.
- 9.13 Deficit and surplus heat loads.

Course Summary & Conclusion

Registration Form:

Please fill the information below:

Nominee Name:			
Company Name:			
Position Title:		Department:	
Phone:		Mobile:	
Email:			
Company Address:			
Do you want to request this to be conducted as an In-House Course?		NO <input type="checkbox"/>	YES <input type="checkbox"/>
		<i>Please fill the required additional information below</i>	
Date Required:		No. of Participants:	
Preferred Venue:		Other Requirements:	

Course Fees:

The amount of **3500 USD** will be charged for the course fee and Full Payment is required prior to commencement of the course.

Payment Methods:

A confirmation will be sent upon your registration. Note that full payment must be made prior to the event. Only those delegates who have paid in full will be admitted to the event. All payments should be to "APEX FZ LLC" Account:

Bank Name : Emirates NBD

Branch : Jebel Ali Branch, Dubai, UAE

IBAN No : AE260260001024622899402

Swift Code : EBILAEADJAZ

Cancellation:

If you are unable to attend the course you may send a substitute delegate.

Cancellation should be made 15 days prior to the course conduction. Failure to cancel within 10 days will be to pay the course fee in full amount.

Registration Methods:

Email : info@apex-dubai.com

Fax : +971 4 454 2910

Website : www.apex-dubai.com

General Information:

- ◆ Closing of Registration will be two (2) weeks prior to the course date.
- ◆ APEX can assist and provide corporate rates for the hotel accommodation.
- ◆ Course fees will cover Course Materials, Certificate of Participation, Coffee Breaks and Lunch.
- ◆ In-House course is also available upon request and can be customized as per client's needs.

Contact us:

Tel : +971 4 445 8567

Fax : +971 4 454 2910

Email : info@apex-dubai.com

Website : www.apex-dubai.com