



MU289: Direct Fired Heaters: Design and Operations

Training Description:

A long-established technology, direct-fired heaters have a history of successful operation at plants around the world. But combustion and heat transfer technologies are continually evolving. New engineered solutions for a complex new world of energy production dictate the increased use of fire heaters in a wide range of specialized process applications. Reducing downtime and maintenance costs are top priorities. Improving thermal efficiency can lead to significant energy savings, and can also help reduce harmful air emissions.

One way to realize efficiency is through improved design. Another is to increase the operational know-how of onsite plant personnel, through focused training on fired-heater design and construction, process-flow parameters and other variables that affect operation.

Training Objectives:

This course is carefully structured to provide practical and exclusive training applicable to engineers, technicians, management or operating facility superintendents who work with direct-fired heaters, furnaces and waste heat recovery units, and burner management systems.

By the end of the training, participants will be able to:

- ✓ Identify and list the applicable codes and standards for fired process heaters
- ✓ Determine the mechanical limitations of heaters
- ✓ Describe the theoretical and practical aspects of burners and combustion air supply, common and complex instrumentation applications, heater operation, tube and refractory design
- ✓ Explain key operating parameters
- ✓ Employ techniques to minimize emissions, corrosion and fouling
- ✓ Implement safe practices and identify safety issues
- ✓ Identify typical problems and possible causes
- ✓ Identify key inspection and turnaround items

Training Designed for:

This course is intended for experienced managers for the process, production, mechanical, maintenance, and instrumentation engineers, and for senior supervisors and superintendents, trainee process engineering trainees, inspectors, and plant operators at petrochemical refineries and gas processing facilities.

This course is specifically designed to help plant engineers better understand the function of direct fired heaters. We focus on the most common design types, considering fuel type, combustion chemistry, heat transfer and release, combustion air supply and control, and mechanical factors including burners, refractory tube design, and corrosion and fouling mitigation. We also review techniques to improve efficiency, operate safely and meet emission guidelines.

Training Requirement:

“Hand’s on practical sessions, equipment and software will be applied during the course if required and as per the client’s request.”

Contents can be adapted to your specific wishes. It is therefore possible to focus on specific modules of the training course as per client's learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Training Program:

THREE DAYS:

- ❖ Heat Transfer and Fired Heaters
 - Fundamentals of Heat Transfer
 - Types of Heaters & Configuration
 - Development & Service Categories
 - Vertical and Cabin Style Heaters
- ❖ Direct-Fired Heater Applications
 - Natural Gas Process Plants
 - Oil Refineries
 - Design Considerations and Data Sheets
 - Process Conditions
 - Total Duty Calculations
- ❖ Heater Duty and Efficiency
 - Heater Duty-Q
 - Heater Efficiency Measurement & Improvement
- ❖ Draft and Excess Air Control
 - Dampers & Draft Control
 - Excess Air Control
- ❖ Combustion and Burners
 - Burners: Design and Types
 - Low & Ultra-Low NOx Burners
 - Flue Gas Recirculation
 - Burner Orientation
 - Heat Release, Fuels and Burner Data
 - Emissions
- ❖ Refractory
 - Refractory Purpose
 - Refractory Types
 - Dry-Out
- ❖ Safety Systems
 - Burner Management Systems
 - Purging
 - Pilots and Ignition Systems
 - Dedicated Flame-Monitoring Systems
- ❖ Operations and Monitoring
 - Safe Practices
 - Commissioning and Start-up Procedures
 - Heater Operation
 - Controlled Heater Shutdown

- Emergency Shutdown
- Heater Monitoring
- ❖ Routine Inspections, Maintenance Troubleshooting
 - Inspections
 - Maintenance
 - Pigging & Steam – Air Decoking
- ❖ Troubleshooting
 - Working Examples
- ❖ Case Studies / Practical Exercises
- ❖ Course Conclusion
- ❖ POST-ASSESSMENT and EVALUATION

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Gamification, Software & General Discussions
- Pre and Post Test

Training Certificate(s):

CMCT Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Fees:

TBA as per the course location - This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

Training Timings:

Daily Timings:

07:45 - 08:00	Morning Coffee / Tea
08:00 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:00	Recess (Prayer Break & Lunch)
13:00 - 14:00	Last Session

For training registrations or in-house enquiries, please contact:

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