



Furnaces and Boilers Efficiency: Combustion & Heat Recovery Techniques

Duration: 5 Days

Language: en

Course Code: IND04 - 132

Objective

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

- Understand combustion principles and their impact on energy efficiency.
- Assess and reduce waste heat in furnace and boiler systems.
- Design and select appropriate heat recovery technologies.
- Analyse system performance and implement optimisation strategies.
- Identify economic and environmental benefits of improved combustion techniques.
- Develop effective maintenance plans to extend system life and minimise energy losses.

Audience

This course is ideal for:

- Energy and process engineers.
- Plant and facility managers.
- Furnace and boiler operators.
- Maintenance and reliability engineers.
- Environmental and sustainability managers.
- Technical consultants working on industrial energy projects.

Training Methodology

This course combines theoretical knowledge with practical learning using technical presentations, group discussions, case studies, and scenario-based exercises. The methodology ensures deep comprehension and equips participants with tools they can directly apply in their facilities.

Summary

Improving energy efficiency in industrial heating systems is more crucial than ever. Furnaces and boilers are essential components in many sectors, yet they often operate with significant energy losses. This course offers participants a comprehensive understanding of modern combustion techniques, waste heat recovery, and system optimisation strategies that improve performance, reduce emissions, and lower operational costs.

Through practical examples, technical insights, and strategic approaches, attendees will gain the tools to evaluate, design, and implement high-efficiency combustion systems and heat recovery methods suitable for a wide range of industrial applications.

Course Content & Outline

Section 1: Fundamentals of Combustion and Heat Losses

- Introduction to combustion theory and fuel types.
- Key components and operation of furnaces and boilers.
- Heat loss types: flue gas, radiation, standby losses.
- Basics of energy conservation in heating systems.

Section 2: Identifying and Quantifying Waste Heat

- Sources of waste heat in industrial processes.
- Tools and methods for waste heat analysis.
- Energy auditing of furnace and boiler systems.
- Economic assessment of recovery opportunities.

Section 3: Heat Recovery Technologies and System Design

- Overview of heat recovery equipment: recuperators, regenerators, economisers.
- Design criteria and system integration.
- Heat exchanger types and selection.
- Thermodynamics in heat recovery.

Section 4: Implementation, Monitoring, and Optimisation

- Installation and start-up of recovery systems.
- Instrumentation and control for performance tracking.

- Predictive maintenance and inspection methods.
- Safety protocols and regulatory considerations.

Section 5: Real-World Applications and Future Innovations

- Case studies of successful heat recovery systems.
- Best practices in combustion and thermal efficiency.
- Emerging technologies: low-NOx burners, smart controls.
- Workshop: Creating an efficiency improvement plan for your facility.

Certificate Description

Upon successful completion of this training course, delegates will be awarded a Holistique Training Certificate of Completion. For those who attend and complete the online training course, a Holistique Training e-Certificate will be provided.

Holistique Training Certificates are accredited by The CPD Certification Service (CPD), and are certified under ISO 9001 and ISO 29993 standards.

CPD credits for this course are granted by our Certificates and will be reflected on the Holistique Training Certificate of Completion. In accordance with the standards of The CPD Certification Service, one CPD credit is awarded per hour of course attendance. A maximum of 50 CPD credits can be claimed for any single course we currently offer.

Categories

Energy and Oil & Gas, Engineering, Health, Safety & Environment HSE

Tags

Furnaces Efficiency, Boilers Efficiency, Heat Recovery Techniques, Safety protocols

Related Articles



Educating for Sustainability: The Promise of Renewable Energy Courses

Educating for Sustainability: The Promise of Renewable Energy Courses

Explore renewable energy education—key to climate action, energy security, and green careers. Learn trends, tech, and SDG-driven opportunities.