



# فعالية الأفران والغلايات: تقنيات الاحتراق واسترداد الحرارة

**Duration:** 5 Days

**Language:** ar

**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

Holistique Training. عند إتمام هذه الدورة التدريبية بنجاح، سيحصل المشاركون على شهادة إتمام التدريب من (e-Certificate) وبالنسبة للذين يحضرون ويكملون الدورة التدريبية عبر الإنترنت، سيتم تزويدهم بشهادة إلكترونية من Holistique Training.

وحدة اعتماد التطوير المهني (BAC) معتمدة من المجلس البريطاني للتقييم Holistique Training شهادات ISO 29993، ISO 21001 أو ISO 9001 كما أنها معتمدة وفق معايير (CPD) المستمر

لهذه الدورة من خلال شهادتنا، وستظهر هذه النقاط على شهادة إتمام (CPD) يتم منح نقاط التطوير المهني المستمر واحدة عن كل ساعة CPD يتم منح نقطة CPD، ووفقاً لمعايير خدمة اعتماد Holistique Training التدريب من لأي دورة واحدة نقدمها حالياً CPD حضور في الدورة. ويمكن المطالبة بحد أقصى قدره 50 نقطة

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Renewable energy education is vital for sustainable energy transitions, addressing climate change, energy security, and economic growth. Courses integrate cutting-edge technologies and interdisciplinary approaches, preparing students for diverse careers. Future trends include online learning, industry collaboration, and alignment with Sustainable Development Goals.