



**Asia Masters Center**

## **Installation, Inspection, & Repair of Refractory Designs**



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## Installation, Inspection, & Repair of Refractory Designs

### Course Objective

- To provide participants with the basic knowledge and skills for selection of different refractory materials based on process requirements.
- To introduce participants to different manufacturing methods applied to refractory materials and their installation techniques.
- To explain to participants how refractory materials respond to different service conditions and issues related to their quality and reliability.
- To familiarize participants with the main concepts and technical terms of industrial refractory materials.
- To explain to participants the different types of hot processes and their requirements.
- To explain to participants the different types of industrial refractories
- To explain to participants how to relate process requirements to refractory properties (mechanical, thermal, electrical and chemical/corrosion).

## ➡ Target Audience

- Design engineers
- Process engineers
- Maintenance engineers
- Product development engineers and managers

## ➡ Course Outline

### **Day 1**

#### **Introduction**

- Technical Perspectives
- Historical Perspectives
- Foundations of Hot Processing
- Computational Quantities and Conversion Factors
- Hot Processing Temperatures and Their Measurement
- Process Chemistry and Environments
- Foundations of Refractory Application
- Continuous Types Vertical
- Continuous Types Horizontal

### **Day 2**

#### **Contemporary Hot Processing Equipment**

- Batch Types Circular
- Batch Types Rectangular
- Other Refractory Applications
- Principles of Thermal Stability
- Melting Points of Substances
- Melting of Oxide Mixtures

- Microstructural Integrity
- Principles of Corrosion Resistance: Oxidation-Reduction
- Importance of Corrosion
- Gibbs Free Energies
- Refractory Alteration by Oxidation-Reduction
- Principles of Corrosion Resistance: Hot Liquids
- Liquid Penetration and Dissolution-Corrosion
- Factors Governing Penetration
- Factors Governing Dissolution
- Principles of Corrosion Resistance: Hot Gases and Dusts
- Atmospheric Penetration and Condensation

### **Day 3**

#### **Classification of Working Refractory**

- Dusts: Deposition and Abrasion
- Conclusion: Principles of Working Refractory Construction
- The Working Refractory Product Line
- Maximum Service Temperatures
- Maximum Service Temperatures
- Corrosion Resistance
- Qualifications for Working Refractory Service
- The Insulating Refractory Product Line
- Applications and Application Criteria
- Classification of Insulating Refractory
- Physical Form and Installation of Linings

## **Day 4**

### **Refractory Practice**

- Refractory Qualifications in Review
- Refractory Practice from Qualifications
- Catalogue of Refractory Practice
- Design Properties: Thermal and Electrical
- Reversible Thermal Expansion
- Permanent Deformation
- Specific Heat
- Thermal Conductivity
- Electrical Conductivity
- Design Properties: Mechanical

## **Day 5**

### **Elasticity and Plasticity**

- Mechanical Characterization of Refractory
- Illustrative Mechanical Properties of Refractory
- Refractory Manufacture
- Consolidated Flow Diagram for Refractory
- From Raw Materials to Forming
- Forming of Masonry and Special Shapes
- Agglomeration for Sintered Grain
- Drying and Firing of Refractory
- Quality Assurance in Manufacture
- Refractory Installation and Maintenance
- Structural Engineering
- Masonry Construction
- Installation of Monolithic challenge of risk and uncertainty in modern business

### ➤ **The Feature Of Asia Master Training And Development Center**

- we pick up the customer from the airport to the hotel.
- we give the participant training bag includes all the necessary tools for the course.
- Working within groups to achieve the best results.
- All our courses are confirmed and we do not postpone or cancel the courses regardless of the number of participants in the course.
- We can assist you in booking hotels at discounted prices if you wish to book through us.
- We offer the certificate from Asia Masters Center for Training and Administrative Development.

### ➡ **The Cost Of The Training Program Includes The Following:**

- 1) Scientific article on flash memory.
- 2) Training Room.
- 3) Training.
- 4) Coffee break.
- 5) The training bag includes all the tools for the course.

**Price (USD)**

**Communicate with the training department  
to know the participation fees**

➤ **There are offers and discounts for groups**

**The details of the bank account**

**Bank name: CIMB Bank Berhad**

**Account name: Asia Masters Center SDN. BHD**

**Bank account number: 80-0733590-5**

**Swift code: CIBBMYKL**

**IBAN: Null**