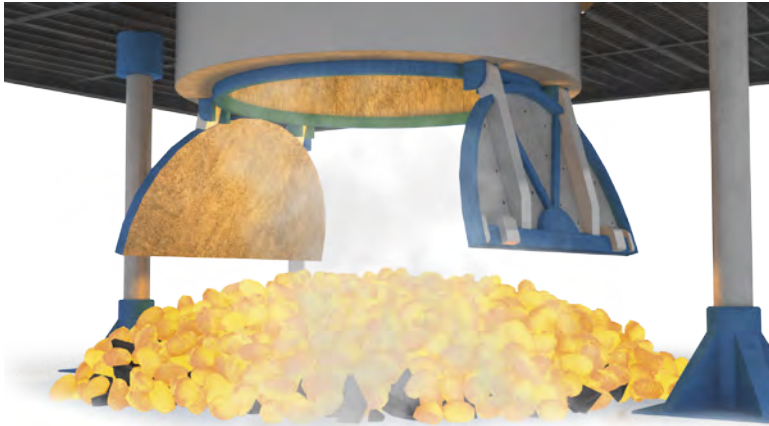


CUPOLA FURNACE OPERATIONS

eLearning courses designed to increase productivity and profits



Learning made Simple, Visual, and Interactive

This course aims to provide cupola operators and other interested individuals a basic understanding of the cupola furnace and how it operates. In understanding the cupola, it is first necessary to comprehend the cupola process in terms of the melting process, heat transfer, as well as the chemical reactions and gas reactions that occur within the furnace. The course also presents two main cupola turnaround procedures in which all cupola operators should be familiar with, followed by a look at the various operating procedures and control tests that should be performed to run the cupola efficiently and consistently.

Credit Hours **4**

Learning Objectives

- Identify the zones of the cupola and describe what occurs in each.
- Understand the principles of heat exchange and the chemical and gas reactions in the cupola.
- Breakdown and discuss the heat turnaround and campaign turnaround processes.
- Recognize and explain the operating procedures used to improve the cupola's efficiency.
- Distinguish between the control tests and understand their importance.

Table of Contents

I. The Cupola Process

- The Melting Process in the Cupola Zones
 - o Preheating Zone
 - o Melting Zone
 - o Reduction Zones
 - o Oxidation or Combustion Zone
 - o Well Zone
- Heat Transfer
- Chemical Reactions
- Gas Reactions in the Oxidation Zone

II. Cupola Turnaround

- Heat Turnaround
- Campaign Turnaround
 - o Draining the Trough

- o Quenching the Cupola
- o Dropping the Cupola Bottom
- o Chipping and Patching the Cupola
- o Making the Cupola Bottom
- o Preparing the Coke Bed

III. Operating Procedures

- Cupola Procedures
 - o Preparation
 - o Fill-Up
 - o Start of Melt
 - o Operating
 - o Shutdown
- Melting Records

IV. Control Tests

- Metal Tests
 - o Temperature Measurement
 - o Cooling Curve Analysis
 - o Chill and Wedge Tests
 - o Chemical Analysis (Metal)
- Slag Tests
 - o Slag Appearance
 - o Chemical Analysis (Slag)

