Course Syllabus for:

Casting Defect Analysis

Course Code	CEUs
1-200	1.1 CEUs

Course Introduction

The intention of this course is for participants to become proficient in applying a ten step procedure that will enable them to analyze and reduce metalcasting defects by correctly identifying defects and their root causes, and determining appropriate corrective actions. This course is applicable to sand molding processes (green, nobake, coldbox, shell).

Benefits to Taking the Course: In order to determine the true root cause of a casting defect and select the proper corrective action, a systematic evaluation method must be applied. Implementing the wrong solution can cost the foundry in terms of runtime, cost, waste, safety, reduced return on investment or profit, sales and expertise. Learning a systematic procedure for root cause identification supports the business goal of designing, producing and selling quality castings that are made in a timely manner and in a safe environment for a profit.

Learning Outcomes:

After completing this course, participants should be able to:

1. Name the 4 most common casting defects, and identify the causes and potential solutions for each.
2. Given defect samples, apply a ten-step procedure in order to correctly identify the casting defects and their root causes, and determine appropriate corrective actions and solutions using the AFS-CIATF International Atlas of Casting Defects and the three AFS Casting Defects handbooks in order to minimize or eliminate the defects.

Lesson Outline

- Introduction
  - Course purpose and goals
  - 10 Step Root Cause Analysis Tool
  - Business goals related to defect identification
- Casting Defects Overview
  - Why a 10 Step Procedure?
  - Setting scrap rates
  - Defect categories
- Demonstration of Root Cause Analysis
- Sand-Related Defects
- Oxide-Related Defects
- Group Problem Solving
- Gas-Related Defects
- Shrink-Related Defects
- Group Problem Solving
- Wrap-up
  - Review & assessment of learning outcomes
  - Course Evaluation

Instructional Methods:

- Demonstration
- Guided problem solving practice
- Group activities
- Class discussion
- Information research
- Q&A

Assessment Methods:

No formal assessment will take place in this course; however, attendees will participate in informal activities such as knowledge check and Q&A sessions with the facilitator to verify that learning outcomes are being met. Assessment of successful achievement of learning outcomes must be included throughout the course in order to meet the ANSI/IACET 1-2013 standard for continuing education programs and for CEUs to be awarded.

Course Prerequisites:

Prior to taking this course, participants should be able to:

- explain the basic process and principles of metalcasting using appropriate terminology.

  Or

- have taken the *Introduction to Metalcasting* Institute course.

Texts, Books or other Resources Included in the Registration Fee:

- AFS-CIATF *International Atlas of Casting Defects*

  and choice of 1 of the 3 handbooks below

  - AFS *Casting Defects Handbook: Iron and Steel*
  - AFS *Casting Defects Handbook: Aluminum & Aluminum Alloys*
  - AFS *Casting Defects Handbook: Copper & Copper-Base Alloys*

Attendee Requirements to Earn CEUs:

1. Present at least 10 hrs of the total 11 hrs of instructional time (90%), which does not include lunch or breaks.
2. Active participation (can include asking questions, communicating with other attendees during and taking part in group activities, providing responses during whole class or group discussions).
3. Successful achievement of learning outcomes.

Who Should Attend?

The target audience for this course consists of individuals responsible for:

- Managing and overseeing the production management staff
- Managing and supervising production staff
- Purchasing, sales, marketing or office operations
- Auditing/inspecting/quality control
- Production or engineering