



Course Code 2-210	CEUs 1.0 CEUs
Course Length 2 days, classroom course	

Course Introduction:

The first day includes a review of important raw material requirements for green sand systems, an introduction to applications requiring specialty sands, and the types of sand additives and their effects on green sand. You will explore key concepts for sand equipment, sand handling and storage, sand reclamation and re-use, and have access to important safety procedures used to avoid injury.

The day culminates in a look at green sand process variables and methods to make adjustments to these variables to ensure a quality mold is made. Day two will focus on green sand quality control tests for ferrous and nonferrous alloys, the types, purpose, frequency, and typical result ranges for each. You will discuss typical problem areas seen in green sand metalcasting facilities and how test results can identify areas for correction. The day will finish with an introduction to statistical process control for sand systems.

Benefits to Taking the Course: Benefits to taking this course include obtaining essential knowledge for green sand molding as it is used in established metalcasting facilities. The course provides a basic foundation of the green sand mold making process, and dramatizes the process of recognizing green sand process variables how to make minor adjustments when variables need correction. This course addresses the types of tests used for controlling green sand mold quality, and how those test results begin to shape changes in the process.

Learning Outcomes

1. Summarize the typical green sand systems used for various alloys.
2. Identify applications requiring specialty sands.
3. Describe common sand additives used in green sand metalcasting facilities.
4. Identify the equipment and processes used to handle and reclaim sand.
5. Examine green sand process variables and how to make adjustments to them.
6. Explain the various quality control tests used in green sand foundries.
7. Use quality test data to evaluate green sand for corrective action.
8. Recognize common quality control problems.
9. Describe the important safety measures and operating practices to use in green sand foundries.

Lesson Outline

Module 1: Introduction

Module 2: Green Sand Molding Issues

- GSM Scenarios

Module 3: Sand, Clay and Mixes

- Sand and Clay
- Typical Green Sand Mixes

Module 4: Components of Green Sand Systems

- Facing and Specialty Sands
- Sand Additives

Module 5: Sand Handling and Mixing

<ul style="list-style-type: none"> • Sand Handling and Mixing Equipment • Sand Storage • Reclamation and Reuse <p>Module 6: Green Sand Quality Control Testing</p> <ul style="list-style-type: none"> • Quality Assurance Testing • Quality Assurance Problem Areas <p>Module 7: Green Sand Quality Control</p> <ul style="list-style-type: none"> • Adjusting Independent Variables • Sand System SPC Overview • SPC and the Control Strategy <p>Module 8: Conclusion</p>
<p>Instructional Methods:</p> <ul style="list-style-type: none"> • Individual, group and pair activities • Problem solving exercises • Mini examples and case studies • Worksheet completion • Video viewing • Story sharing and discussion
<p>Assessment Methods:</p> <ul style="list-style-type: none"> • Instructor-led knowledge checks • Group activities, report back and debrief • Discussion • Q&A
<p>Course Prerequisites, if any:</p> <p>It is recommended that you have taken <i>Green Sand Molding 101</i> prior to attending this course.</p> <p>Recommended pre-requisite knowledge:</p> <ul style="list-style-type: none"> • The raw materials used in making green sand and the typical percentages of each used in green sand mixtures • The types of tools and equipment used in making a green sand mold • The most common processes used to make green sand molds • Proper sand compaction techniques • Typical challenges faced in green sand foundries with regards to raw materials, equipment, and green sand mixtures • Common defects seen in green sand foundries
<p>Texts, Books or other Resources available for purchase:</p> <ul style="list-style-type: none"> • <u>Principles of Sand Control</u>, AFS Publication
<p>Attendee Requirements to Earn CEUs:</p> <ol style="list-style-type: none"> 1. Present at least 8.5 hours of the total 9.5 hours of instructional time (90%), which does not include meals 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.
<p>Who Should Attend?</p> <ul style="list-style-type: none"> • Green sand molder/mold operator • Foundry foreman/supervisors or lead persons • Sand lab technicians • Sand lab supervisors • Maintenance personnel • Foundry engineer • Foundry sales personnel