



Course Code 2-240	Course Length 6.5 hours
CEUs 0.7 CEUs	

Course Introduction

Permanent mold casting is a significant and major process used in the metalcasting industry today. It can produce high quality and consistent products when a variety of control parameters are used to manage the overall process. This course provides essential information on key factors that affect the thermal profile in a permanent mold casting process cycle. The course will look at the most common permanent mold manufacturing practices for mold thermal management that focus on ensuring product quality.

Benefits to Taking the Course:

Proper understanding and application of mold materials and properties, mold design, mold preparation, casting methods and temperature control parameters; examine types of permanent mold defects related to die temperature issues for the longevity of die life; general techniques instead of specific requirements for a given shape since these can differ from casting product to product.

Learning Outcomes

After completing this course, participants should be able to:

1. Identify the types and properties of mold materials along with factors used in the selection and design of permanent molds for thermal control.
2. Explain the permanent mold process and machine safety measures.
3. Identify various cooling, heating and other methods of controlling permanent mold temperatures.
4. Explain the importance of documenting the permanent mold process.
5. Recognize and troubleshoot various defects of permanent mold castings.

Lesson Outline

Module 1: Introduction

Module 2: Permanent Mold Casting Process

- Lesson 1: Permanent Mold Casting Process
- Lesson 2 : Machine Safety

Module 3 : Mold Materials and Mold Design

- Lesson 1 : Types of Mold Materials
- Lesson 2 : Properties of Mold Materials
- Lesson 3 : Selection of Mold Material
- Lesson 4 : Design Considerations

Module 4 : Permanent Mold Temperatures

- Lesson 1 : Pre-heat Molds
- Lesson 2 : Cooling & Heating Methods
- Lesson 3 : Operating Temperature Parameters

Module 5 : Documentation of Permanent Mold Process

- Lesson 1 : Why Document
- Lesson 2 : What Needs to Be Documented

Module 6 : Inspecting Permanent Mold Defects

<ul style="list-style-type: none"> • Lesson 1 : Mold Defects: Common Causes and Troubleshooting • Lesson 2 : Casting Defects: Common Problems and Troubleshooting <p>Module 7 : Conclusion & Wrap up</p>
<p>Instructional Methods:</p> <ul style="list-style-type: none"> • Facilitator led discussion and questioning • Group discussions • Group activities • Individual exercises • Case studies • Shared experience discussions • Q&A sessions
<p>Assessment Methods:</p> <p>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.</p>
<p>Course Prerequisites:</p> <p>General understanding of the components and terminology of the permanent mold casting process used for aluminum alloys.</p>
<p>Pre-course Activities:</p> <p>None</p>
<p>Texts, Books or other Resources:</p> <p>None</p>
<p>Attendee Requirements to Earn CEUs:</p> <ol style="list-style-type: none"> 1. Present at least 5.9 hours of the total 6.5 hours 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.
<p>Who Should Attend?</p> <p>Individuals responsible for activities related to permanent mold making and operation, such as:</p> <ul style="list-style-type: none"> • foundry engineer • foreman • quality and inspection personnel • tool engineer/mold designer • personnel involved in mold set up and mold holding fixture