

Course Syllabus for:

Casting Material Properties



Course Code 8-320	CEUs 0.3 CEUs
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Course Introduction

This course provides an in depth discussion on expected performance of a casting. The production process influences the resulting mechanical properties and expected level of quality. The impacts of irregularities and post casting treatments is discussed along with testing methods for determining properties and existing sources of property information that can be used in the casting's design.

Learning Outcomes:

1. Identify and describe a variety of production characteristics that can influence the mechanical properties of a casting
2. Identify various tests to determine a casting's material characteristics.
3. Identify the impact of the distribution of mechanical properties on the function of the casting in-service.

Lesson Outline

- Introduction
- Module 2: Production Influence on Casting Properties
 - Cooling Rates and Heat Flow
 - Casting Irregularities that Impact Mechanical Properties
 - Post Casting Treatments
- Module 3: Measuring Casting Properties
 - Test Specimen Locations
 - Testing Types
- Module 4: Impacts of Properties on Performance
 - Properties vs. Performance
 - Simulations
 - CADS Case Studies
- Conclusion

Instructional Methods:

- Facilitator-led discussion
- Group discussion
- Individual/Small group activities
- 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:

- Intro to Alloys and Aluminum Metallurgy 201, Iron Metallurgy 201, or Copper Metallurgy 201
- Casting Design 201 is recommended but not required

Texts, Books or other Resources for Purchase:

- [Aluminum Alloy Castings: Properties, Processes & Applications](#)
- [ASM Metals Handbook, 2nd Edition](#)
- [Cast Iron Properties Database for Modern Design Methods](#)
- Designing and Purchasing of Metal Castings
- [Science and Engineering of Casting Solidification](#)

Attendee Requirements to Earn CEUs:

1. Present at least 2.7 hrs of the total 3 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:

- Designing castings
- Performing casting FEMA
- Performing casting property measurements