

## Cast Iron Modules

### CI1: Introduction to Cast Iron

In this module, we will identify what industries use cast iron; identify what elements are alloyed together to make cast iron; and define several mechanical and physical properties that make cast iron the choice to use. By the end of the module, you will be able to describe the critical factors and features of cast iron that make it the casting alloy of choice. Estimated module time is 40 minutes. CEU units awarded: 0.1 CEU units.

### CI2: Introduction to Cast Iron Microstructure

In this module, we will recognize the differences between unary, binary, and ternary phase diagrams; identify the microstructure components in the cast iron phase diagram and explain how and why microstructures form. By the end of this module, you will be able to identify unary, binary, and ternary phase diagrams. Estimated module time is 30 minutes. CEU units awarded: 0.1 CEU units.

### CI3: Six Families of Cast Iron

In this module, we will explore the designation systems and details of each of the six families of cast iron. The **Introduction to Cast Iron** module is a prerequisite for this module. By the end of this module, you will be able to identify how elements in cast iron are adjusted to produce different grades; explain the classification systems for each of the six cast iron families; and discuss the mechanical and physical properties of each of the six families of cast iron. Estimated module time is 45 minutes. CEU units awarded: 0.1 CEU units.

### CI4: Elements in Cast Iron

In this module, we will explore the roles of carbon, silicon, and alloying elements in cast iron. This module will conclude with two real world case studies that compare different cast iron grades. By the end of this module, you will be able to analyze how different elements affect the properties of cast iron. Estimated module time is 40 minutes. CEU units awarded: 0.1 CEU units.

### CI5: Introduction to Cast Iron Melting

In this module, we will provide a brief overview of the cast iron melting process. We will define general safety practices to perform while working on the shop floor and when visiting a metalcasting

facility. We will also identify the multiple furnace types used in cast iron melting. By the end of this module, you will be able to briefly explain the metalcasting process and apply safety procedures to your daily work environment. Estimated module time is 40 minutes. CEU units awarded: 0.1 CEU units.

*CI6: Basic Melt Practices for Cast Iron*

In this module, we will explore the different melting and pouring procedures; quality tests (pre- and post-casting); talk about cooling rates; and introduce the three types of melt treatments used in metalcasting facilities. By the end of this module, you will be able to state four important inspection/testing methods for determining cast iron quality and describe the basic melting practices and related technologies for cast iron. Estimated module time is 45 minutes. CEU units awarded: 0.1 CEU units.

*CI7: Introduction to Cast Iron Heat Treatments*

In this module, we will examine the reasons why cast iron metalcasting facilities heat treat their castings. We will also define the various heating and cooling cycles available. By the end of this module, you will be able to explain the use of heat treatment in cast iron and how that affects mechanical properties and cost. Estimated module time is 20 minutes. CEU units awarded: 0.1 CEU units.