Course Syllabus

Metalcasting for Purchasing Professionals

Course Code	CEUs
11-100	1.2 CEUs

Course Introduction

This course provides a foundational introduction to metalcasting, designed specifically for buyers and supplier development professionals who are new to the industry. Participants will explore the major casting processes, learn how to select and audit metalcasting suppliers, understand the critical elements of the Production Part Approval Process (PPAP), and develop strategies for managing quality problems when they arise. The course concludes with a practical look at total cost of ownership, long-term agreements, building a portfolio of approved casting suppliers, and strategies for building redundancy and contingency into a metalcasting supply chain.

Benefits to Taking the Course

Benefits include a practical, buyer-focused foundation for sourcing and managing metalcasting suppliers. Participants gain the vocabulary and process knowledge to evaluate foundry capabilities, interpret quality documentation such as PPAP, control cost drivers like surcharges and total cost of ownership, and build a resilient, redundant supplier base that can withstand disruption.

Learning Outcomes

After completing this program, participants should be able to:

1. Describe various metalcasting processes and explain how metalcasting differs from other industries.
2. Describe the current state of the metalcasting industry.
3. Identify important considerations in selecting a metalcasting supplier, including foundry audits.
4. Describe key elements of the metalcasting production part approval process (PPAP).
5. Identify the seven primary metalcasting defect categories and the 10-step process to eliminate defects.
6. Describe surcharges and the concept of Total Cost of Ownership.
7. Identify the critical elements and pros and cons of long-term agreements.
8. Identify the key elements of building a portfolio of approved metalcasting suppliers.
9. Describe strategies for building redundancy and contingency into a metalcasting supply chain.

Lesson Outline

- Module 1: Metalcasting Industry Overview
  - What is Metalcasting?
  - The Metalcasting Process
- Module 2: State of the Metalcasting Industry
  - U.S. Supply Base and Structure
  - Demand Trends and Market Outlook
  - Reshoring, Tariffs, and Sourcing Trends
- Module 3: Types of Metalcasting Processes
  - Sand Molding
  - Permanent Molding
  - Die Casting
  - Investment Casting
  - Rapid Prototyping
- Module 4: Choosing a Metalcasting Supplier
  - My Tier 1 Supplier is a Machine Shop. Why Does it Matter Where They Source Castings?

- Foundry Audits
- Module 5: Production Part Approval Process (PPAP)
  - What is PPAP?
  - The 18 PPAP Elements
  - PPAP Submission Levels
  - Critical Elements and Best Practices
- Module 6: Help, I Have Porosity! Understanding Casting Defects
  - Defect Categories
  - Common Defects
  - The AFS 10-Step Procedure
- Module 7: Surcharges
  - What are Surcharges?
  - Metal and Alloy Surcharges
  - Energy and Fuel Costs
  - Tooling, Minimum Orders, and Other Costs
  - How Surcharges Are Calculated and Best Practices
- Module 8: Total Cost of Ownership (TCO)
  - TCO in Metalcasting
  - The Five Pillars of Casting TCO
  - Hidden Costs
  - Building a TCO Model
- Module 9: Long-Term Agreements
  - Why Long-Term Agreements Matter
  - Essential Contract Elements
  - Pricing & Escalation Clauses
  - Risk Management Pitfalls
  - Negotiation Best Practices
- Module 10: Building Your Approved Supplier Portfolio
  - What is an Approved Supplier List?
  - Qualifying and Tiering Suppliers
  - Scorecards & Monitoring
  - Portfolio Optimization
- Module 11: Redundancy & Contingency Planning
  - Building Redundancy & Contingency Plans
  - Warning Signs and Risk Monitoring
  - Responding to a Supplier Transition or Closure
- Module 12: Course Review and Next Steps

Instructional Methods

- Class discussion
- Group discussions
- Group activities
- Case studies and scenarios
- Video

Assessment Methods

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

Course Prerequisites

None

Attendee Requirements to Earn CEUs

1. Present at least 11 of the total 12 hours of direct instructional time, which does not include meals or breaks.
2. Active participation (can include asking questions, communicating with other attendees during group activities, providing responses during class or group discussions).
3. Successful achievement of learning outcomes.

Who Should Attend?

- Purchasing and procurement staff
- Buyers
- Supplier development engineers
- Sourcing managers
- Anyone new to purchasing or managing metalcasting suppliers