

Course ID
PLST-OTHR
Course Duration
2 days

Course Title
Materials and Methods: Designing for Plastics vs. Other Materials

- Related Courses**
- Plastic Materials Selection (PLAST-MS, 4 days)
 - Plastics: Design for Producibility, Molds, and Molding (PLST-DES, 3 days)
 - Plastic Parts Failure Analysis (PLAST-FA, 3 days)
 - Poka-Yoke: A Comprehensive Workshop for Improving Product and Process Quality By Preventing Defects (POKAYOKE, 2 days)
 - Geometric Dimensioning and Tolerancing (GDT, 2 days)
 - Statistical Tolerance Analysis: A Comprehensive Workshop (S-TOL-ANAL, 2 days)
 - Statistical Process Control (SPCON, 3 days)
 - Root Cause Failure Analysis and Experiment Design Techniques (RCFA3D, 3 days)
 - Cost Reduction: Opportunities and Strategies (COSTRED, 2 days)
 - Quality Management (QUALMGT, 3 days)

Aimed At This course is aimed at product development teams who wish to optimize their transition to plastics or plastics blended with other commodities. It's also suitable for those who need to acquire a comparative understanding of the concepts-to-production methods and materials, both plastics and other.

Group Size 5-25

Prerequisites Basic understanding of design and manufacturing processes.

Course in a Nutshell Product development teams strive to produce parts that satisfy all of the design criteria, meet all of the functional requirements, and are cost effective as well. To do that, they must understand proper material selection, various processes involved, production volumes, tolerances, dimensional limits, finish, manufacturing site, service, re-manufacture, and – increasingly – environmental impact. However, the primary determiner of “good” producibility is the design itself. Early collaborative evaluation of the design by the design engineers, manufacturing engineers, tooling suppliers, and parts producers will result in the production of parts that are optimal in every respect.

This course will introduce you to the concepts of concurrent engineering as well as the tools needed to develop multiple design concepts produced with a variety of commodities and tooling methods. Although a variety of commodities and tooling methods will be discussed, there will be a strong emphasis on how to effectively transition to the use of plastics or blends of plastics and other materials.

The course concludes with a half day workshop devoted to a hands-on exercise on material and tool cost estimation for plastics and other materials/methods.

Customize It!

We can customize this course to meet the backgrounds and needs of your particular audience, usually at little to no additional cost. We can conduct the course to focus on how to design for various methods and materials, plastics being one of them. Or we can gear it more toward plastics as your needs require.

Learn How To

- Describe the importance of DFA/DFM and concurrent engineering.
- Detail the different types of manufacturing, their production systems, and tooling methods.
- Define total manufacturing cost.
- Understand prototype and production tooling methods for plastics and other commodities.
- Learn how to optimize design requirements and manufacturing methods and provide validation for choosing plastics over other materials / methods.
- Understand the pros/cons of plastic tooling methods relative to:
 - Functionality
 - Material properties
 - Production material
 - Quantity of one to production quantities
 - Cost
 - Lead time
 - Tolerance
 - Complexity
 - Appearance
- Select the most economical material, tooling, and process that meet customer requirements.

Course Outline

- Introduction to Manufacturing
 - Definition
 - DFA/DFM and Concurrent Engineering Teams
 - Mass vs. Lean Production
 - Types of Manufacturing and Production Systems
 - An Environmental Manufacturing System
- Cost Estimating Systems
 - Cost Types and Elements
 - Cost Formulae
 - Cost Estimating Tools
 - Cost Confidence Levels
- Tooling Methods for Plastics and Other Materials / Methods
 - Prototype/vs. Production Tooling

- Hard/Soft/Tool-less Manufacture
- Tool Selection
- Producibility Processes for Plastics and Other Materials / Methods
 - Process and Material Selection
 - Stamping
 - Injection Molding
 - Blow Molding
 - Die Casting
 - Extrusion and Drawing
 - Powder Metal
 - Machining
- Material and Tool Cost Estimating for Plastics and Other Materials / Methods (*“Hands-on” Exercise*)
 - Tooling Decision Process
 - Tooling Strategy Selection Chart
 - Prototype Process Selection Charts
 - Production Tool Cost Estimating Charts
 - Part Cost Estimating Methods
- Wrap-up
 - Course Recap and Q/A
 - Evaluations

Revised

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