IPC Standards: A Guide for the Electronics Industry
SYLLABUS

INSTRUCTOR INFORMATION

Instructor: Francisco Fourcade

Email: franciscofourcade@ipc.org

Phone: +34 661323231

Best time to call: Usually available between 7am – 9am Eastern Time USA.

PROGRAM DESCRIPTION

This in-depth course explores the IPC standards essential throughout PCB (Printed Circuit Board) design, fabrication, assembly, inspection, and testing. Participants will gain an understanding of the structure of IPC standards and how they are applied at each phase of the manufacturing process. The course covers key standards such as J-STD-001 and IPC-A-610 while offering an in-depth overview of all IPC standards related to manufacturing processes that help ensure product quality and optimize manufacturing efficiency.

Francisco Fourcade is the Electronics Technology Standards Manager at IPC leading standards work in Europe and supports projects worldwide. He joined IPC in 2022, bringing over 10 years of experience training and certifying electronics professionals, and has long been involved in IPC's standards efforts.

LEARNING AND PERFORMANCE OBJECTIVES

This program is designed to provide designers, assemblers, engineers, and management with a wide overview of PCBA and wire harness manufacturing processes and relevant standards used by industry. Upon completion, participants will be able to:

- Understand the structure and purpose of IPC standards in electronics manufacturing.
- Navigate the IPC standards library and specification tree.
- Identify IPC standards applicable to design, fabrication, assembly and testing of PCBA and Wire Harnesses.
- Explore the standards covering processes and materials for PCB assembly and testing.
- Create awareness for special industry segments such as automotive and military standards.

COURSE STRUCTURE

- Instructor and participants meet online from the comfort of their own home or office

- Participants can view recorded online sessions to review course content and class discussions

- Participants apply key concepts to resolve real-world issues

- Course materials are accessible 24/7 on the new IPC Edge Learning Management System.

- The course can be accessed on virtually any device with an Internet connection and major web browser, including Chrome, Firefox, Safari, Edge, and Internet Explorer

SUPPLEMENTAL MATERIALS

- IPC Document Revision Table
- IPC Checklist for Printed Board Assemblies
- IPC Specification Tree

COURSE SCHEDULE

SESSION 1

Session 1: Introduction to IPC Standards
- Overview of IPC and why standards are important in manufacturing.
- How IPC standards are developed and maintained
- Understanding the IPC standard specifications tree
- Exploring classification in IPC standards
  - Key differences between Producibility Levels (A, B, C) in relation to Performance Classes: Class 1, Class 2, and Class 3.
- Knowledge Check

SESSION 2

Session 2: PCB Design
- How standards apply at the design stages of manufacturing
- Introduction to PCB design standards
- Most important design topics
  - Design considerations for manufacturability and electrical performance.
  - Layer stack-up and material selection.
  - Trace width and clearance guidelines.
  - Component placement and routing.

Global Electronics Association™

- o Land Patterns: Density Levels
- o Component Classification Levels
- o Electrical Parameters
- o Material Parameters
- o Documentation and Dimensional Tolerances
- Knowledge Check

SESSION 3

Session 3: PCB Fabrication
- Intro to PCB Fabrication standards
  - o Key IPC standards for PCB fabrication
  - o Overview of IPC-601X Series
- Overview of specifications for
  - o Base materials
  - o Surface Finishes
- Visual inspection criteria for PCB acceptability
- Real Life Printed Board Fabrication Examples
- Knowledge Check

SESSION 4

Session 4: PCB and Wire Harness Assembly
- Intro to PCB Assembly standards
  - o Key IPC standards for PCB Assembly
  - o Industry Segment Addendums
- Materials in PCB Assembly
  - o Joint Industry Standards
  - o IPC Standards
- Processes in PCB Assembly
- Design and Processes in Wire Harness Assembly
- Processes in Box Build Assembly
- Knowledge Check

SESSION 5

Session 5: Conformal Coating and Cleaning Processes
- Intro to Cleaning and Coating Standards
  - o Key IPC standards for Cleaning
  - o Cleaning Requirements by J-STD-001
  - o Key IPC standards for Coating, Potting and Encapsulation
- Special applications
- Test Methods for Cleanliness Assessment
- Knowledge Check

Session 6: Inspection, Testing and Quality Assurance
- Intro to Inspection, Testing and Quality Assurance Standards
  - Key IPC standards for PCBA Inspection
  - Key IPC standards for Testing
  - Key IPC standards for Quality Assurance
- Inspection standards and practices
- Overview of reliability testing and criteria
- In-System programming guidelines
- Reliability standards for long-life and high-reliability PCBAs
- Knowledge Check