



Wire Harness Assembly for Operators SYLLABUS

The Wire Harness Assembly for Operators course introduces the key tools, materials, and processes for operators working in wire harness assembly. This course is designed to encompass the entire wire harness assembly process, including a customizable selection of Modules to address the current needs and future goals of operators and organizations.

COURSE OBJECTIVE

After completing this course, the student will be able to perform basic wire harness assembly processes within a manufacturing facility.

LEARNING OBJECTIVES PER COURSE MODULE

MANDATORY MODULES

MODULE 1: INTRODUCTION TO WIRE HARNESS ASSEMBLY

- Describe wire harness assemblies and what led to their introduction
- Distinguish benefits of wire harness assemblies compared to individual wires
- Identify common uses of wire harness assemblies
- Explore reasons why wire harness assemblies require high quality workmanship

MODULE 2: SAFETY

- Identify standard safety signage and symbols for assembly operators
- Describe standard safety procedures for protecting assembly operators and equipment
- Identify potential risks and hazards of standard materials used by wire harness assembly operators
- Describe safety concerns of using common wire harness assembly tools and equipment

MODULE 3: ENGINEERING DOCUMENTATION

- Identify types of engineering documentation used in wire harness assembly
- Explain how engineering drawings are used as a build reference
- Describe the relationship of work instructions, assembly sequence, and reference specifications
- Identify components of a Bill of Materials

MODULE 4: MATERIALS AND COMPONENTS

- Identify properties of solder, flux, adhesive, and potting/encapsulation
- Identify types of wires and cables used in wire harness assembly
- Distinguish wire insulation types and gauge
- Recognize terminal types
- Identify common connector types

MODULE 5: TOOLS AND EQUIPMENT

- Explore common tools and equipment used in wire harness assembly
- Identify measurement tools used in wire harness assembly
- Distinguish methods for taking accurate physical measurements
- Define tool calibration process

MODULE 6: WIRE PREPARATION AND PROCESSING

- Explain steps in wire preparation and processing
- Define requirements for measuring cables and wires
- Describe methods for measuring, cutting, stripping, and tinning wire
- Identify inspection criteria for wire preparation

MODULE 7: INSPECTION AND TESTING

- Identify common IPC standards used by wire harness assembly operators
- Explain the need for inspection and describe the use of magnification
- Identify common electrical and mechanical tests used in wire harness assembly

FINAL EXAM FOR MANDATORY MODULES 1-7

Participants must complete the Final Exam for Modules 1 through 7 with a passing score of 80% to access and download their Qualified IPC Wire Harness Assembly Operator Certificate. Students may attempt the exam up to three (3) times. Please note that a third and final attempt is permitted after 24 hours of the second attempt.

OPTIONAL MODULES

MODULE 8: CRIMP TERMINATIONS

- Explain differences between crimping methods
- Identify acceptable and defect conditions for open barrel crimp terminations
- Identify acceptable and defect conditions for closed barrel crimp terminations
- Identify acceptable and defect conditions for machined crimp terminations

MODULE 9: SOLDERED TERMINATIONS

- Identify types of soldered terminations
- Explain processes for attaching wires to terminals
- Differentiate between acceptable and defect conditions for soldered terminations

MODULE 10: SPLICING

- Identify the purpose of wire splices
- Explain the process of soldered, crimped, and ultrasonic wire splices
- Apply acceptance criteria for soldered, crimped, and ultrasonic wire splices

MODULE 11: CONNECTOR ASSEMBLY

- Describe characteristics of connectors used in wire harness technology
- Explain the purpose of strain relief and braid terminations in connectors
- Differentiate crimping and soldering methods of connectorization
- Apply methods for inspecting and testing connector assemblies

MODULE 12: COAXIAL CABLE

- Describe parts of a coaxial cable
- Identify types of coaxial cables
- Distinguish most common coaxial cable connector types
- Describe common coaxial cable preparation steps
- Identify coaxial cable and connector assembly methods

MODULE 13: LABELING, SECURING, AND COVERING

- Describe requirements for labeling wire harness assemblies
- Identify label types and acceptance criteria
- Evaluate label placement and location
- Identify common securing devices
- Describe effects of improper tension of securing devices
- Identify common wire harness coverings

MODULE 14: FINISHED ASSEMBLY INSTALLATION

- Recognize requirements for hardware installation
- Distinguish criteria for wire harness installation
- Identify conditions for finished assembly installation

COURSE RESOURCES

Everything you need to successfully complete the Wire Harness Assembly for Operators course is included and available on the IPC EDGE Learning Management System.

MODULE COMPONENTS AND REQUIREMENTS

The Wire Harness Assembly for Operators program provides engaging videos, activities, and quizzes designed to help you learn, remember, and apply the knowledge and skills you will need to excel as a wire harness operator. Each module is composed of the components described in Table 1.

Table 1. Module Components and Description

| Module Component | Description |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module Pre-Quiz | Short (3 to 5 questions) quiz designed to help you identify what you know and what you need to learn |
| Module Sections | “Bite-sized” segments of text, videos, graphics, and activities that explain the key points of the Module content and provide opportunities for you to think about how you would apply wire harness assembly processes at work |
| Module Post-Quiz | Five to 10-question quiz designed to help you confirm what you know and identify areas that still need work. |