MERCURY

# Power Cable Manufacturing and Factory Testing Training Course

22 – 26 February 2027
Barcelona (Spain)



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# Power Cable Manufacturing and Factory Testing Training Course

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The Power Cable Manufacturing and Factory Testing Training Course is a one-week course for electrical plant engineers, quality assurance inspectors, and utility procurement specialists auditing production runs. Working with extrusion parameters, routine electrical testing logs, and standard specifications, you develop a Cable Manufacturing and Factory Acceptance Plan. Mercury Training Center delivers this course to help you enforce technical compliance across industrial cable supply chains.

## About This Course

Undetected insulation voids, improper conductor stranding, and incomplete routine electrical tests lead to premature dielectric breakdown and costly utility line outages. To follow this course, you must already oversee cable specifications, factory inspections, or plant electrical acceptance procedures. Through manufacturing reviews and test log evaluations, you master production line controls and factory acceptance verification.

## Who It Is For

- Professionals responsible for auditing medium and high voltage cable fabrication facilities and production quality systems
- Professionals responsible for reviewing factory routine, sample, and type test documentation prior to site shipment
- Professionals responsible for preparing technical procurement specifications and setting material inspection standards
- Professionals responsible for witness testing extruded solid dielectric power cables at vendor plants

This course is not for civil cable trenching technicians seeking basic field laying guides, nor is it for domestic wiremen seeking general residential wiring overviews.

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## Competencies You Will Build

- Conductor Quality Verification: Auditing conductor materials, stranding geometry, and direct current resistance tolerances under IEC 60228.
- Extrusion Process Auditing: Monitoring triple-extrusion line operations, continuous vulcanization parameters, and degassing chamber controls for extruded solid dielectric power cables.
- Routine Dielectric Testing: Executing factory spark testing and high-voltage withstand verifications in accordance with IEC 60502-1 and IEC 60502-2.
- Diagnostic Measurement Analysis: Interpreting factory partial discharge logs and dissipation factor Tan Delta measurements to detect insulation voids.
- Fire Performance Assessment: Evaluating flame propagation, smoke density, and halogen acid gas emission reports against IEC 60332, IEC 61034, and IEC 60754 standards.
- Transmission Prequalification Review: Assessing long-term aging test protocols and sample qualification dossiers under IEC 60840 and IEC 62067:2022.

## What You Will Be Able to Do

By the end of the course you will be able to:

- From IEC 60228 requirements, determine allowable direct current resistance and stranding compliance for copper and aluminum conductors.
- Given extrusion line logs, evaluate continuous vulcanization temperatures and degassing cycles for cross-linked polyethylene insulation.
- Using IEC 60502-1 and IEC 60502-2 criteria, verify factory routine high-voltage tests and offline partial discharge screening results.
- From IEC 60840 and IEC 62067:2022 frameworks, audit prequalification test records and sample test data for extra-high-voltage systems.
- Given factory fire test reports, evaluate circuit integrity, smoke density, and halogen emission thresholds under IEC 60331 and IEC 60754.
- Using vendor inspection dossiers, formulate a Cable Manufacturing and Factory Acceptance Plan to govern supplier production and release.

## Course Content

## Day 1: Conductor Fabrication and Material Specifications

- Conductor Material Properties and Annealed Copper Versus Aluminum Metallurgy
- Conductor Stranding Profiles, Compaction, and Direct Current Resistance Rules in IEC 60228
- Low-Voltage Extruded Cable Construction Rules Under IEC 60502-1
- Dimensional Checks, Conductor Screening, and Factory Spark Testing for Cores
- Vendor Material Mill Certificates and Raw Polymer Granule Quality Checks

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## Day 2: Insulation Extrusion, Cross-Linking, and Sheathing

- Medium-Voltage Construction and Material Requirements Under IEC 60502-2
- Triple-Extrusion Lines and Catenary Continuous Vulcanization Process Controls
- Cross-Linked Polyethylene Curing Reactions and Byproduct Degassing Chamber Protocols
- Metallic Screening, Tape Armor Application, and Outer Sheath Compound Requirements
- Water-Blocking Tapes and Moisture Barrier Construction Methods for Direct Burial

## Day 3: Routine and Sample Electrical Factory Testing

- Conductor DC Resistance Checks and Wheatstone Bridge Measurement Workflows
- High-Voltage AC Withstand Factory Testing Protocols and Safety Enclosures
- Factory Partial Discharge Inception and Extinction Voltage Diagnostic Measurements
- Tan Delta Dielectric Loss Angle Dissipation Factor Measurements at Rated Voltage
- Sample Tests for Insulation Thickness, Hot Set Elongation, and Shrinkage

## Day 4: High-Voltage Systems, Fire Performance, and Type Testing

- High-Voltage Cable and Accessory Testing Requirements Under IEC 60840
- Extra-High-Voltage Systems and Prequalification Protocols Under IEC 62067:2022
- Flame Retardance and Vertical Flame Propagation Testing Under IEC 60332 Series
- Circuit Integrity Under Fire Conditions in Accordance With IEC 60331 Series
- Smoke Density Verification in IEC 61034 and Halogen Acid Gas Tests in IEC 60754

## Day 5: Witness Auditing and Factory Acceptance Governance

- Exercise on Conductor Resistance and Insulation Thickness Non-Conformance Review
- Exercise on Factory Partial Discharge and High-Voltage Withstand Test Evaluation
- Exercise on High-Voltage Cable System Prequalification Dossier Verification
- Exercise on Factory Acceptance Testing Witness Hold Points and Sign-Off Checklists
- Finalization of the Cable Manufacturing and Factory Acceptance Plan

## Case Studies and Exercises

These suggested activities provide practical application of manufacturing quality assurance across varied operating sectors:

- Case study: An industrial petrochemical processing facility where you audit medium-voltage power cable factory test records, cross-referencing halogen-free sheath tests and flame propagation reports against project requirements.
- Case study: A utility transmission network expansion where you review extra-high-voltage prequalification records under IEC 62067:2022 and establish hold points for witness testing.
- Exercise: A marine power distribution project where you evaluate conductor resistance variances and cross-linking degassing logs from a vendor production run to identify premature breakdown risks.
- Exercise: A commercial infrastructure development where you prepare a factory acceptance checklist for low-voltage power cables under IEC 60502-1, reconciling drum lengths and spark test records.

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## What You Take Back

The Cable Manufacturing and Factory Acceptance Plan provides standardized quality criteria, witness inspection hold points, and test evaluation matrices to govern supplier manufacturing oversight during your first month back at work. You will use it to audit vendor plants, review routine factory logs, and approve shipments.

- Vendor manufacturing line audit checklists covering extrusion and continuous vulcanization parameters
- Factory acceptance test verification templates for high-voltage dielectric and partial discharge diagnostics
- Conductor resistance and dimensional compliance calculation worksheets based on IEC 60228
- Material conformity sign-off matrices for fire performance and prequalification documentation

## Quick Answers FAQ

### What background is required before attending the Power Cable Manufacturing and Factory Testing Training Course?

You need practical experience in electrical engineering, plant inspection, quality assurance, or power utility procurement. Prior exposure to industrial electrical equipment specifications or facility acceptance processes ensures you can readily evaluate the manufacturing controls and technical testing standards presented.

### How does this course differ from field cable installation and splicing courses?

Field installation and splicing courses focus on trenching, cable pulling tension, joint assembly, and site termination techniques. This course focuses on factory production processes, continuous extrusion controls, material quality verification, and factory acceptance testing protocols at the manufacturing facility.

### Why is factory partial discharge testing vital before cable dispatch?

Factory partial discharge testing detects minute microscopic voids and contaminants within extruded insulation before cables leave the factory. Identifying these localized dielectric defects early prevents catastrophic insulation breakdown and system failures during live operational service.

### What work product do you take back from the Power Cable Manufacturing and Factory Testing Training Course?

You take back a Cable Manufacturing and Factory Acceptance Plan containing plant audit checklists, dielectric test verification matrices, and material compliance sheets ready to govern technical procurement and vendor factory oversight.

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## For Your Manager

This course prepares your team member to audit cable manufacturing facilities, inspect production line processes, and evaluate factory acceptance test reports with technical rigor. Upon returning, they immediately implement the Cable Manufacturing and Factory Acceptance Plan to verify supplier compliance with international standards, reducing premature failure risks and preventing costly utility delivery delays.