



Power Cable Manufacturing Course: Wire Drawing, XLPE Extrusion and Testing



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Introduction:

Power cable manufacturing, covering wire drawing, XLPE extrusion and testing, is a 5-day course for production, process and quality engineers in cable plants that ends with a Quality and Scrap Reduction Plan for a case extrusion line. Cable plants lose margin and customer trust when conductor resistance drifts, insulation eccentricity grows, contaminants cause routine test failures and scrap builds up at every changeover. Nominees already run, set up or release drawing, extrusion or test lines, and each day uses walkthroughs of process stages, line records and test reports. CoreConcept Training Center delivers this power cable manufacturing course.

Course Objectives:

- Map the layer sequence, voltage class and conductor class of a power cable to the plant stages that produce each layer
- Set wire drawing, annealing and stranding parameters that hold conductor resistance, surface quality and lay length within specification
- Operate insulation extrusion, triple extrusion, crosslinking and degassing within a defined process window for low, medium and high voltage cables
- Apply metallic screens, armour and oversheaths and verify dimensions with online gauging and offline measurement
- Plan routine, sample and type tests and trace insulation defects and test failures to their process causes
- Produce a Quality and Scrap Reduction Plan with line KPIs, controls and owners for a case extrusion line

Target Audience:

- Production engineers responsible for output, changeovers and crews on drawing, stranding, extrusion and armouring lines
 - Process engineers who set line parameters, tooling and compound handling rules for insulation and sheathing
 - Quality engineers who plan factory tests, review test reports and release cable reels to customers
 - Test laboratory staff who carry out electrical, dimensional and material tests on finished cable and samples
 - Maintenance and line technical staff who keep extruders, curing tubes, gauges and test equipment in condition
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Course Outline:

Day 1: Power Cable Construction, Types and Plant Process Flow

- Power Cable Layer Sequence From Conductor to Outer Jacket
- LV, MV and HV Cable Types and Voltage Classes
- IEC 60228 Conductor Classes 1, 2, 5 and 6
- Cable Plant Process Flow Map From Rod to Reel
- Current-State Line Baseline Using Scrap, Yield and Downtime

Day 2: Conductor Manufacture and Insulation Compound Selection

- Rod Breakdown Wire Drawing With Carbide and Diamond Dies
- Die Reduction Ratio, Lubrication and Wire Surface Quality Checks
- Continuous Annealing for Ductility and Conductor Resistance Recovery
- Concentric, Compacted and Sector Stranding With Lay Length Control
- PVC, XLPE, EPR and LSZH Compound Properties Compared

Day 3: Extrusion, Crosslinking, Screening and Armouring Lines

- Extruder Screw, Crosshead and Tooling Set-Up for Insulation
- Triple Extrusion of Conductor Screen, XLPE and Insulation Screen
- Peroxide Curing on Catenary and Vertical Continuous Vulcanisation Lines
- Silane Moisture Cure, Degassing Ovens and Clean Compound Handling
- Copper Wire Screen, Steel Wire Armour and Oversheath Application

Day 4: Process Control, Factory Testing and Defect Analysis

- Online Dimensional Gauging for Eccentricity and Insulation Thickness
- Routine, Sample and Type Test Plan per IEC Cable Requirements
- Partial Discharge and Tan Delta Routine Testing at Overview
- Voids, Contaminants, Protrusions and Scorch Defect Root Cause Analysis
- Plant Safety Controls for Extruders, Curing Tubes and Test Bays

Day 5: Inspection Walkthrough Building a Quality and Scrap Reduction Plan

- Case Extrusion Line Walkthrough Against Process Control Criteria
 - Case Scrap Pareto by Defect Type and Line Stage
 - Case Test Failure Investigation Using Fishbone and Five Whys
 - Yield and Changeover Waste Targets on a Line KPI Dashboard
 - Quality and Scrap Reduction Plan Completion and Defence
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Skills You Will Gain:

- Cable Construction Mapping
- Wire Drawing Set-Up
- Stranding Parameter Control
- Insulation Extrusion Control
- Crosslinking and Degassing Supervision
- Factory Test Planning
- Insulation Defect Diagnosis
- Scrap and Yield Analysis

Why Attend This Course:

- Deliver a Quality and Scrap Reduction Plan for a case extrusion line to the plant manager and the quality lead
- Decide when a gauge reading, compound lot or test result justifies stopping a line, adjusting tooling or quarantining a reel
- Avoid routine test failures, eccentric insulation and changeover scrap that consume compound, line hours and delivery dates
- Share line set-up sheets, defect catalogues and test plans with operators, technicians and laboratory staff

Conclusion:

Back at work, the participant hands the Quality and Scrap Reduction Plan to the plant manager, the quality lead and the line supervisors. They use it to fix process windows for drawing and extrusion lines, set gauge and test checkpoints, target the largest scrap sources and decide which tooling, compound handling or maintenance changes to fund. After the first full month under the plan, the plant should compare scrap, yield, routine test failures and changeover losses against the baseline and revise the actions that have not delivered.

Frequently Asked Questions FAQ:

What should participants know before the power cable manufacturing course?

Participants should already work on or support a cable production line and know its main stages. No polymer chemistry background is needed. Bringing anonymised line records, scrap reports or test results helps them apply the walkthroughs and the plan to their own plant.

How does power cable manufacturing differ from a course on cable installation and field testing?

It concentrates on making cable in the factory: drawing, stranding, extrusion, crosslinking, screening, armouring and factory tests. Installation courses work on rating, laying, jointing and diagnosing circuits already in service; those topics appear here only as the customer context for factory quality.

Why does XLPE insulation need degassing in power cable manufacturing?

Degassing removes by-products of peroxide crosslinking that remain in the XLPE after curing. Left in the insulation they can affect electrical tests and later accessory work, so medium and high voltage cable is held under controlled heat before screening and sheathing.

What do participants take back from the power cable manufacturing course?

Participants take back a Quality and Scrap Reduction Plan for a case extrusion line, with a line walkthrough checklist, a scrap Pareto, a defect root cause record, a factory test plan and a line KPI dashboard they can adapt to their own plant.
