CORE CONCEPT

Transformer Manufacturing Course: Core, Windings, Drying and Factory Tests

9 – 13 November 2026
London - Central London four-star

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Introduction:

Transformer manufacturing, covering the core, windings, drying and factory tests, is a 1-week course for production, process, quality and test-bay engineers in transformer plants, ending with a Transformer Factory Quality and Capacity Plan for a case plant. Plants lose margin and delivery slots when no-load losses exceed guarantees, damp insulation fails dielectric tests and active parts queue for ovens and test bays. Nominees already run, set up or release core, winding, drying, tanking or test operations, and each day uses inspection walkthroughs of shop stages, travellers and test records. CoreConcept Training Center delivers this transformer manufacturing course.

Course Objectives:

- Map core form, shell form, oil-immersed and cast-resin product families to the factory stages, travellers and hold points that produce them
- Control electrical steel slitting, cutting and step-lap stacking so that burr height, building factor and no-load loss stay within design and guarantee values
- Select and set up disc, helical, layer and foil windings with transposed conductor, paper insulation and clamping pressure that hold dimensions and short-circuit strength
- Run vapour-phase or oven drying, tanking and vacuum oil filling cycles to a verified moisture end point before the unit enters the test bay
- Plan IEC 60076 routine and type tests and trace loss, ratio and dielectric test failures back to core, coil or drying causes
- Produce a Transformer Factory Quality and Capacity Plan that sets stage controls, yield targets and oven and test bay loading for a case plant

Target Audience:

- Production engineers responsible for output, crews and changeovers in core cutting, winding and assembly bays
- Process engineers who set cutting, stacking, winding, drying and oil filling parameters and write shop instructions
- Quality engineers who define hold points, review travellers and release finished transformers for dispatch
- Test-bay engineers who plan, run and report factory routine and type tests and investigate failures
- Planning and industrial engineering staff who load ovens, test bays and assembly lines against order books

Course Outline:

Day 1: Transformer Product Families, Factory Flow and Baseline

- Core Form and Shell Form Construction Compared for Production
- Oil-Immersed and Cast-Resin Distribution Transformer Product Families
- Factory Value Stream Map From Steel Coil to Dispatch
- Customer Specification Review and Loss Guarantee Capitalisation
- Current-State Baseline of Lead Time, Yield and Test Failures

Day 2: Core Steel, Core Building and Winding Design Rules

- Grain-Oriented Electrical Steel Grades, Coating and Handling Rules
- Slitting and Cut-to-Length Lines With Burr Height Control
- Step-Lap Mitred Joint Stacking and Building Factor Checks
- Disc, Helical, Layer and Foil Winding Selection Criteria
- Continuously Transposed Conductor and Kraft Paper Insulation Build-Up

Day 3: Coil Winding, Active Part Assembly, Drying and Oil Filling

- Winding Machine Set-Up, Tension Control and Turn Counting
- Coil Clamping, Axial Pressing and Pressboard Spacer Placement
- Lead Exit Brazing, Tap Lead Routing and Core Earthing
- Vapour-Phase Drying Versus Hot-Air Oven and Vacuum Cycles
- Tanking, Vacuum Oil Filling and Mineral Versus Ester Fluids

Day 4: Factory Testing to IEC 60076, Failures and Bottlenecks

- IEC 60076 Routine Tests for Ratio, Resistance and Losses
- Applied and Induced Voltage Tests With Partial Discharge Measurement
- Lightning Impulse and Temperature Rise Type Test Planning
- Test Failure Root Cause Tracing to Core, Coil or Drying
- Drying Oven and Test Bay Bottleneck Capacity Analysis

Day 5: Inspection Walkthrough for a Factory Quality and Capacity Plan

- Case Plant Core Shop and Winding Bay Inspection Checklist
- Case Active Part Moisture and Drying Record Review
- Case No-Load Loss Overrun Investigation Using Fishbone Analysis
- Case Line Balancing and Oven Loading Schedule Build
- Transformer Factory Quality and Capacity Plan Completion

Skills You Will Gain:

- Core Lamination Process Control
- Step-Lap Core Stacking
- Winding Set-Up and Clamping
- Active Part Drying Control
- Vacuum Oil Filling Practice
- Factory Test Planning
- Test Failure Root Cause Tracing
- Oven and Test Bay Capacity Planning

Why Attend This Course:

- Deliver a Transformer Factory Quality and Capacity Plan for a case plant to the plant manager and the quality lead
- Decide when a burr reading, moisture value or test result justifies holding an active part, re-drying a unit or reworking a coil
- Avoid loss guarantee penalties, repeated dielectric test failures and oven or test bay queues that delay dispatch
- Coach core shop, winding bay and test-bay colleagues with inspection checklists, drying records and failure tracing sheets

Conclusion:

Back at work, the participant hands the Transformer Factory Quality and Capacity Plan to the plant manager, the quality lead and the production planner. They use it to fix hold points in the core shop and winding bays, set drying end points, decide which oven or test bay investment to fund and load orders against real capacity. After the first month of shipments under the plan, the plant should compare yield, loss overruns, test failures and lead time against the baseline and revise the actions that have not delivered.

Frequently Asked Questions FAQ:

What should participants know before the transformer manufacturing course?

Participants should already work in or support a transformer factory and know its main stages. No design software experience is needed. Bringing anonymised travellers, drying records or test reports helps them apply the walkthroughs and the plan to their own plant.

How does transformer manufacturing differ from a course on transformer operation and maintenance?

It covers building transformers in the factory: core cutting and stacking, winding, drying, tanking and factory tests. Operation and maintenance courses cover loading, protection, oil diagnostics and overhaul of units already in service; those appear here only as the customer context for factory quality.

Why does transformer manufacturing need vapour-phase or vacuum drying of the active part?

Paper and pressboard absorb moisture during assembly, and moisture lowers dielectric strength and speeds insulation ageing. Drying under heat and vacuum removes it before oil filling, so the unit can pass applied, induced and partial discharge tests and serve a long life.

What do participants take back from the transformer manufacturing course?

Participants take back a Transformer Factory Quality and Capacity Plan with a core shop and winding bay checklist, a drying record review, a loss overrun investigation, a test plan and an oven and test bay loading schedule they can adapt to their own plant.