



Proficiency Testing and Reference Material Production Course: ISO/IEC 17043 and ISO 17034

18 – 22 April 2027

Dammam - Eastern Province five-star



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Introduction:

Proficiency testing and reference material production is a 5-day course for proficiency testing scheme coordinators, reference material producers and laboratory quality leads, ending with a PT Scheme and Reference Material Production Plan for a case organisation. Laboratories and their customers lose confidence when test items are not homogeneous, assigned values are weak, scoring misjudges participants or certified values carry unsupported uncertainty. Nominees already coordinate interlaboratory comparisons, prepare quality control materials or review PT reports, and work through modelling builds on homogeneity, stability and participant data. CoreConcept Training Center delivers this proficiency testing and reference material course.

Course Objectives:

- Design proficiency testing schemes to ISO/IEC 17043, setting scope, test item specification, round frequency and participant instructions
- Assess homogeneity and stability of PT items and candidate reference materials using ANOVA, regression and isochronous study designs
- Derive assigned values and the standard deviation for proficiency assessment using ISO 13528 robust statistics
- Score participant performance with z , z' , zeta and E_n scores and write participant reports that prompt corrective action
- Plan reference material production to ISO 17034, from material sourcing and processing to characterisation and value assignment
- Combine characterisation, homogeneity and stability contributions into certified value uncertainty and issue CRM certificates with traceability statements

Target Audience:

- Scheme coordinators responsible for planning PT rounds, preparing test items and evaluating participant results
 - Reference material production staff responsible for processing, bottling, characterising and certifying candidate materials
 - Metrology institute and reference laboratory staff responsible for value assignment and interlaboratory comparisons
 - Quality managers in food, environmental, clinical and petroleum testing laboratories responsible for selecting PT schemes and CRMs
 - Statisticians and data analysts responsible for robust statistics, scoring and graphical review of interlaboratory data
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Course Outline:

Day 1: Proficiency Testing and Reference Material Landscape

- ISO/IEC 17043 Clause Structure for Proficiency Testing Providers
- ISO 17034 Requirements for Reference Material Producer Competence
- Reference Material Versus Certified Reference Material Distinctions
- PT Scheme Types Including Sequential, Simultaneous and Split-Sample Designs
- Current-State Review of Existing Schemes and Candidate Materials

Day 2: Scheme Design, Test Items and Material Processing

- Scheme Plan Covering Scope, Rounds and Participant Instructions
- Test Item Matrix Selection, Spiking and Subdivision Methods
- Material Processing by Milling, Sieving, Blending and Ampouling
- ISO Guide 35 Homogeneity Study Design and Unit Sampling
- One-Way ANOVA for Between-Unit Standard Deviation Estimation

Day 3: Assigned Values, Performance Scoring and Participant Reports

- ISO 13528 Options for Deriving the Assigned Value
- Algorithm A Robust Mean and Robust Standard Deviation
- Standard Deviation for Proficiency Assessment Selection Approaches
- Z, Z-Prime, Zeta and En Performance Score Calculation
- Participant Report Layout with Kernel Density and Youden Plots

Day 4: Stability, Characterisation and Certified Value Uncertainty

- Real-Time, Accelerated and Isochronous Stability Study Designs
- Characterisation by Single Method, Multiple Methods or Interlaboratory Study
- Certified Value Uncertainty Budget From Characterisation, Homogeneity and Stability
- CRM Certificate Content and Metrological Traceability Statement
- Failed Round Handling for Heterogeneous Items and Outlier Participants

Day 5: Modelling Build of the PT Scheme and Reference Material Production Plan

- Case Homogeneity and Stability Data Evaluation for Candidate Batch
 - Case Assigned Value and Participant Scoring Workbook Build
 - Case Certified Value and Uncertainty Calculation for Certificate
 - Post-Certification Shelf-Life Monitoring and Scheme Round Planning
 - PT Scheme and Reference Material Production Plan Completion
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Skills You Will Gain:

- Proficiency Testing Scheme Design
- Homogeneity and Stability Assessment
- Robust Statistical Analysis
- Participant Performance Scoring
- Reference Material Characterisation
- Certified Value Uncertainty Budgeting
- CRM Certificate Preparation
- Interlaboratory Data Visualisation

Why Attend This Course:

- Deliver a PT Scheme and Reference Material Production Plan to the head of the proficiency testing or reference material unit for approval
- Decide whether a candidate batch is homogeneous and stable enough to distribute, and which assigned value and scoring rule each round uses
- Avoid unfair participant scores, withdrawn certificates and wasted batches caused by weak homogeneity designs or unsupported certified values
- Coach coordinators, analysts and production technicians with the homogeneity workbook, scoring template and certificate checklist

Conclusion:

Back at work, the participant presents the PT Scheme and Reference Material Production Plan to the head of the proficiency testing or reference material unit, the technical manager and the statistician who evaluates rounds. Management uses it to approve test item batches for distribution, fix the assigned value and scoring rules for the next round, and sign off certified values and shelf-life before materials are released to laboratories. After the first round or batch run under the plan, the unit should review participant feedback, homogeneity results, stability monitoring data and certificate queries, and revise any step that fell short.

Frequently Asked Questions FAQ:

What should participants know before proficiency testing and reference material production training?

Participants should already prepare test items, coordinate interlaboratory rounds or work on reference material batches, and be comfortable with means, standard deviations and spreadsheet formulas. Anonymised homogeneity data, past round results or a draft certificate help during the modelling build day.

How does proficiency testing and reference material production training differ from a laboratory quality management course?

A laboratory quality management course prepares a testing laboratory to take part in PT and use reference materials. This course sits on the provider side: designing schemes, preparing homogeneous and stable items, setting assigned values, scoring participants and certifying reference materials with their uncertainty.

Why do proficiency testing and reference material production depend on homogeneity and stability studies?

Without them, a participant may be scored on a unit that differs from the rest, and a certified value may drift before use. Homogeneity and stability results also feed the standard deviation for proficiency assessment and the certified value uncertainty.

What does a participant take back from proficiency testing and reference material production training?

A PT Scheme and Reference Material Production Plan for a case organisation, with a homogeneity and stability evaluation, an assigned value and scoring workbook, a certified value uncertainty budget and a shelf-life monitoring schedule the unit can adapt to its own materials.
