

LAPT

LONDON ACADEMY OF PROFESSIONAL TRAINING

CERTIFICATE

ISO 9016 — Destructive Tests on Welds in Metallic Materials

ISO Certification Programme



LAPT — London Academy of Professional Training

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Reference MTL-ORM-9016 • ISO Materials

UKPRN 10067351 • Registered in England and Wales, company 4984798

AT A GLANCE

REFERENCE	MTL-ORM-9016
AWARD	Certificate
ASSESSMENT	430 marks — 258 to pass (60%)
PREREQUISITES	None
VALIDITY	Lifetime
AWARDING BODY	LAPT — London Academy of Professional Training

CURRICULUM

1

Case Studies in Weld Testing

5 chapters · 30 classes 45 marks

• 1 Understanding Weld Defects and Their Implications — 6 classes

› 1.1 Identify Common Weld Defects and Their Causes

› 1.2 Analyze the Impact of Weld Defects on Structural Integrity

› 1.3 Evaluate Non-Destructive Testing Methods for Weld Defects

› 1.4 Discuss Case Studies of Failed Welds in Industry

› 1.5 Develop Strategies for Weld Defect Prevention and Mitigation

› 1.6 Implement Quality Control Measures in Weld Testing Procedures

• 2 Overview of Destructive Testing Methods on Welds — 6 classes

› 2.1 Identify Key Destructive Testing Methods for Welds

› 2.2 Explain the Importance of Destructive Testing in Welding

› 2.3 Describe the Procedures for Tensile Testing on Welds

› 2.4 Analyze Impact Testing Results and Their Relevance

› 2.5 Compare Different Destructive Testing Techniques in Weld Evaluations

› 2.6 Apply Destructive Testing Methodologies to Real-world Case Studies

• 3 Case Studies: Identifying Weld Defects through Destructive Testing — 6 classes

› 3.1 Analyze Common Types of Weld Defects Found in Metallic Materials

› 3.2 Explore the Importance of Destructive Testing in Weld Quality Assurance

› 3.3 Identify the Methodologies for Conducting Destructive Tests on Welds

› 3.4 Examine Real-World Case Studies of Failed Welds and Their Impact

› 3.5 Evaluate Results from Destructive Testing to Determine Weld Integrity

› 3.6 Apply Knowledge to Recommend Improvements in Weld Design and Testing Processes

• 4 Analyzing Test Results: Interpretation and Reporting — 6 classes

› 4.1 Analyze Weld Test Data for Defects

› 4.2 Interpret Nondestructive Testing Results

› 4.3 Assess the Impact of Test Variables on Weld Integrity

› 4.4 Identify Common Weld Failure Modes Through Case Studies

› 4.5 Create Comprehensive Reports on Weld Test Findings

› 4.6 Present and Defend Test Interpretations to Stakeholders

• 5 Continuous Improvement: Lessons Learned from Case Studies — 6 classes

› 5.1 Analyze Case Studies of Weld Test Failures

› 5.2 Identify Key Factors Contributing to Weld Quality

› 5.3 Evaluate Destructive Testing Methods and Their Outcomes

› 5.4 Implement Root Cause Analysis Techniques in Welding

› 5.5 Develop Action Plans for Continuous Improvement in Weld Testing

› 5.6 Present Lessons Learned and Best Practices to Stakeholders

• 1 Fundamentals of Quality Assurance in Welding Processes — 6 classes

- › 1.1 Define Quality Assurance in Welding Processes
- › 1.2 Identify Key Components of a Quality Assurance System
- › 1.3 Explain the Importance of Standards in Welding Quality
- › 1.4 Assess Common Welding Defects and Their Impact
- › 1.5 Evaluate Destructive and Non-Destructive Testing Methods
- › 1.6 Develop an Action Plan for Implementing Quality Assurance in Welding

• 2 Understanding ISO 9016 Standards and Protocols — 6 classes

- › 2.1 Analyze Key Components of ISO 9016 Standards
- › 2.2 Evaluate the Importance of Destructive Testing in Quality Assurance
- › 2.3 Identify Common Challenges in Implementing ISO 9016 Protocols
- › 2.4 Demonstrate Effective Leadership in Quality Assurance Practices
- › 2.5 Implement Strategies for Continuous Improvement in Destructive Testing
- › 2.6 Formulate an Action Plan for Compliance with ISO 9016 Standards

• 3 Leadership Roles in Quality Assurance Teams — 6 classes

- › 3.1 Define Key Leadership Roles in Quality Assurance Teams
- › 3.2 Identify Core Responsibilities of Quality Assurance Leaders
- › 3.3 Explore Effective Communication Strategies for Quality Assurance Leadership
- › 3.4 Analyze Decision-Making Processes in Quality Assurance Teams
- › 3.5 Implement Coaching Techniques for Quality Assurance Team Members
- › 3.6 Evaluate Leadership Styles and Their Impact on Quality Assurance Outcomes

• 4 Assessment and Evaluation Techniques in Welding Quality — 6 classes

- › 4.1 Identify Key Assessment Metrics for Welding Quality
- › 4.2 Analyze Destructive Testing Methods for Weld Evaluations
- › 4.3 Implement Evaluation Techniques to Ensure Compliance with ISO 9016
- › 4.4 Develop a Quality Assurance Checklist for Weld Inspections
- › 4.5 Conduct Case Studies on Weld Quality Failures and Solutions
- › 4.6 Present Findings and Recommendations for Improving Welding Quality Practices

• 5 Continuous Improvement and Innovation in Welding Quality Assurance — 6 classes

- › 5.1 Identify Key Metrics for Welding Quality Improvement
- › 5.2 Analyze Common Defects in Welds and Their Causes
- › 5.3 Develop Strategies for Effective Welding Process Control
- › 5.4 Implement Continuous Improvement Techniques in Welding
- › 5.5 Foster a Culture of Innovation Among Welding Teams
- › 5.6 Evaluate the Impact of Continuous Improvement on Welding Quality

• 1 Fundamentals of Destructive Testing in Metallic Materials — 6 classes

- › 1.1 Define Destructive Testing and Its Importance in Metallurgy
- › 1.2 Identify Key Types of Destructive Tests for Metallic Materials
- › 1.3 Explain the Principles of Load Testing and Impact Testing
- › 1.4 Analyze the Role of Material Properties in Destructive Testing Outcomes
- › 1.5 Implement Safety Protocols During Destructive Testing Procedures
- › 1.6 Evaluate Test Results to Improve Weld Quality and Performance

• 2 Types of Destructive Tests and Their Applications — 6 classes

- › 2.1 Explore the Fundamentals of Destructive Testing
- › 2.2 Identify Common Types of Destructive Tests
- › 2.3 Compare the Advantages and Disadvantages of Destructive Testing Methods
- › 2.4 Demonstrate the Procedure for Tensile Testing on Welds
- › 2.5 Analyze the Results of Charpy Impact Testing
- › 2.6 Apply Destructive Testing Insights to Real-World Welding Scenarios

• 3 Weld Defects and Their Impact on Material Performance — 6 classes

- › 3.1 Identify Common Weld Defects and Their Characteristics
- › 3.2 Analyze the Causes of Weld Defects in Metallic Materials
- › 3.3 Assess the Impact of Weld Defects on Structural Integrity
- › 3.4 Compare Destructive Testing Methods for Evaluating Weld Quality
- › 3.5 Interpret Results from Destructive Tests on Welds
- › 3.6 Apply Knowledge to Recommend Solutions for Weld Defect Mitigation

• 4 ISO 9016 Standards and Compliance in Testing Procedures — 6 classes

- › 4.1 Understand ISO 9016 Standards for Destructive Testing
- › 4.2 Identify Key Components of Welds in Metallic Materials
- › 4.3 Explore Different Types of Destructive Tests in ISO 9016
- › 4.4 Analyze Compliance Requirements for Testing Procedures
- › 4.5 Evaluate Test Results According to ISO 9016 Guidelines
- › 4.6 Apply ISO 9016 Standards to Real-World Testing Scenarios

• 5 Interpreting and Reporting Test Results for Weld Integrity — 6 classes

- › 5.1 Analyze Test Data for Weld Integrity
- › 5.2 Identify Key Metrics in Destructive Testing Reports
- › 5.3 Interpret Visual Defects and Anomalies in Weld Samples
- › 5.4 Compare Test Results Against Industry Standards
- › 5.5 Compile Comprehensive Reports on Weld Test Findings
- › 5.6 Present Test Results and Recommendations Effectively

• 1 Understanding ISO 9016 Standards and Compliance — 6 classes

- › 1.1 Define ISO 9016 Standards in Welding
- › 1.2 Identify Key Principles of Destructive Testing
- › 1.3 Explore Compliance Requirements for Metallic Welds
- › 1.4 Analyze the Impact of Non-Compliance on Welding Projects
- › 1.5 Examine Case Studies of ISO 9016 Implementation
- › 1.6 Develop a Strategy for Ensuring Compliance with ISO Standards

• 2 Types of Destructive Tests and Their Applications — 6 classes

- › 2.1 Identify Different Types of Destructive Tests for Welds
- › 2.2 Explain the Principles Behind Mechanical Testing Methods
- › 2.3 Analyze the Impact of Heat Affected Zone on Test Results
- › 2.4 Explore Applications of Tensile Testing in Weld Analysis
- › 2.5 Evaluate the Importance of Impact Testing in Material Selection
- › 2.6 Discuss Compliance Standards for Destructive Testing Procedures

• 3 Preparing Samples and Testing Procedures — 6 classes

- › 3.1 Understand the Importance of Sample Preparation in Destructive Testing
- › 3.2 Identify Different Types of Samples for Weld Testing
- › 3.3 Describe the Standard Procedures for Preparing Metallic Weld Samples
- › 3.4 Evaluate Testing Methods: Criteria and Best Practices
- › 3.5 Conduct a Mock Test: Step-by-Step Procedure Implementation
- › 3.6 Analyze Results and Compliance: Interpreting Test Outcomes

• 4 Analyzing Test Results and Compliance Reporting — 6 classes

- › 4.1 Interpret Test Result Data in Compliance with ISO 9016
- › 4.2 Identify Key Compliance Metrics from Weld Test Results
- › 4.3 Assess the Impact of Non-Compliance on Weld Integrity
- › 4.4 Prepare a Compliance Report Based on Analyzed Test Results
- › 4.5 Implement Remedial Actions for Non-Compliant Test Outcomes
- › 4.6 Review Case Studies on Successful Compliance Reporting

• 5 Case Studies and Best Practices in Weld Testing — 6 classes

- › 5.1 Analyze Historical Case Studies of Weld Failures
- › 5.2 Evaluate Best Practices for Destructive Weld Tests
- › 5.3 Identify Common Defects in Metallic Welds
- › 5.4 Discuss Compliance Requirements for Weld Testing Standards
- › 5.5 Implement a Step-by-Step Destructive Testing Procedure
- › 5.6 Present Findings from Case Studies on Weld Integrity

• 1 Understanding Destructive Testing Methods for Welds — 6 classes

- › 1.1 Identify Key Destructive Testing Methods for Welds
- › 1.2 Analyze the Importance of Destructive Testing in Quality Assurance
- › 1.3 Examine Common Standards and Protocols in Destructive Testing
- › 1.4 Interpret Test Data Results from Destructive Tests on Welds
- › 1.5 Compare Destructive Testing Outcomes with Non-Destructive Methods
- › 1.6 Apply Data Analysis Techniques to Assess Weld Integrity

• 2 Fundamentals of Data Collection in Welding Tests — 6 classes

- › 2.1 Understand the Importance of Data Collection in Welding Tests
- › 2.2 Identify Key Variables in Destructive Weld Testing
- › 2.3 Explore Methods of Data Collection in Welding Tests
- › 2.4 Analyze Data Collection Techniques for Weld Quality Assessment
- › 2.5 Apply Statistical Principles to Test Data in Welding
- › 2.6 Evaluate the Impact of Data Integrity on Welding Test Results

• 3 Statistical Analysis Techniques for Test Data — 6 classes

- › 3.1 Introduce Statistical Concepts for Test Data Analysis
- › 3.2 Explain Descriptive Statistics in Weld Testing
- › 3.3 Illustrate the Use of Probability Distributions for Test Data
- › 3.4 Apply Inferential Statistics to Interpret Weld Test Results
- › 3.5 Conduct Hypothesis Testing in the Context of Weld Quality
- › 3.6 Utilize Statistical Software for Data Analysis in Weld Tests

• 4 Identifying Trends and Anomalies in Test Results — 6 classes

- › 4.1 Analyze Historical Test Result Patterns
- › 4.2 Identify Key Statistical Indicators for Trends
- › 4.3 Utilize Graphical Tools to Visualize Data Trends
- › 4.4 Detect Anomalies Through Comparative Analysis
- › 4.5 Assess the Impact of Environmental Variables on Test Results
- › 4.6 Develop Action Plans Based on Trend and Anomaly Findings

• 5 Reporting and Communicating Test Data Effectively — 6 classes

- › 5.1 Understand Key Principles of Test Data Communication
- › 5.2 Identify Key Elements of Effective Test Reports
- › 5.3 Analyze Common Data Presentation Mistakes
- › 5.4 Utilize Visual Aids to Enhance Test Data Clarity
- › 5.5 Develop a Concise Test Data Summary Template
- › 5.6 Practice Delivering Test Data Findings to Stakeholders

• 1 Introduction to Weld Integrity and ISO 9016 Standards — 6 classes

- › 1.1 Define Weld Integrity and Its Importance in Engineering
- › 1.2 Explore the Key Components of ISO 9016 Standards
- › 1.3 Identify Types of Destructive Tests on Welds
- › 1.4 Analyze Factors Affecting Weld Integrity Assessment
- › 1.5 Discuss Common Industry Applications of ISO 9016
- › 1.6 Implement Best Practices for Compliance with Weld Testing Standards

• 2 Destructive Testing Methods for Weld Assessment — 6 classes

- › 2.1 Explore Key Destructive Testing Concepts for Weld Integrity
- › 2.2 Identify Common Destructive Testing Methods for Metallic Welds
- › 2.3 Analyze the Advantages and Limitations of Each Testing Method
- › 2.4 Examine Sample Procedures for Conducting Destructive Tests
- › 2.5 Interpret Results from Destructive Tests on Welds
- › 2.6 Apply Destructive Testing Results to Improve Weld Quality

• 3 Interpreting Test Results and Quality Assessment — 6 classes

- › 3.1 Identify Key Parameters in Weld Testing
- › 3.2 Analyze Common Destructive Test Methods
- › 3.3 Interpret Weld Penetration and Fusion Quality Results
- › 3.4 Evaluate Material Properties Influenced by Welds
- › 3.5 Apply Statistical Techniques to Assess Weld Quality
- › 3.6 Formulate Recommendations Based on Test Interpretations

• 4 Common Defects in Welds and Their Implications — 6 classes

- › 4.1 Identify Common Weld Defects and Their Causes
- › 4.2 Analyze the Impact of Defects on Weld Integrity
- › 4.3 Classify Different Types of Weld Defects
- › 4.4 Evaluate Non-Destructive Testing Methods for Defect Detection
- › 4.5 Develop Strategies for Preventing Common Weld Defects
- › 4.6 Implement Corrective Actions for Weld Defects in Real Scenarios

• 5 Advanced Weld Integrity Techniques and Future Trends — 6 classes

- › 5.1 Explore Advanced Ultrasonic Testing Techniques for Weld Integrity
- › 5.2 Analyze the Role of Thermography in Assessing Weld Quality
- › 5.3 Investigate the Applications of X-ray Diffraction in Weld Analysis
- › 5.4 Evaluate Impact Testing Methods for Weld Performance Assessment
- › 5.5 Discuss Emerging Technologies in Weld Inspection and Integrity
- › 5.6 Predict Future Trends in Weld Integrity Techniques and Their Implications