

Course No. 1662

Welding Inspection & Quality Control

**MATERIALS, WELDING & FABRICATION ENGINEERING
INDUSTRIAL ENGINEERING, MAINTENANCE & OPERATIONS**

DURATION

5 Days

DELIVERY

Classroom



Course Overview

The Welding Inspection & Quality Control Training Course provides a comprehensive and practical framework for controlling welding quality, inspecting welded joints, identifying welding defects, and verifying compliance with applicable technical specifications and project requirements. The course is designed to strengthen the technical capabilities of professionals responsible for welding inspection, quality assurance, quality control, fabrication, and industrial construction.

Welding quality is a critical factor in the safety, reliability, and service performance of industrial equipment and structures. In oil and gas, petrochemical, power generation, manufacturing, construction, and heavy industrial environments, welding defects, inadequate process control, unsuitable materials or consumables, and poor preparation can compromise component integrity and increase the risk of repair, rework, operational disruption, or premature failure.

The program addresses the essential elements of welding quality control, including welding specifications, drawings, welding procedures, welder qualification, base materials, consumables, joint preparation, welding variables, pre-weld inspection, in-process inspection, and post-weld examination. Participants will also explore visual inspection and the principles and applications of non-destructive testing methods used to evaluate welded joints.

A strong emphasis is placed on welding defect identification and evaluation. Participants will examine common defects such as porosity, lack of fusion, incomplete penetration, cracks, undercut, excessive reinforcement, distortion, and other discontinuities. They will learn how to relate observed defects to their potential causes and evaluate them against applicable acceptance criteria.

Through practical exercises, case studies, inspection scenarios, and quality control activities, participants will develop the ability to review welding documentation, conduct structured inspections, interpret examination results, manage non-conformities, investigate recurring welding defects, and recommend corrective and preventive actions. The course supports organizations in strengthening welding quality, reducing rework, improving fabrication reliability, and maintaining effective quality documentation.

Objectives

- Analyze the fundamental principles of welding processes and identify the factors affecting welded joint quality during the course.
- Evaluate welding specifications, engineering drawings, and technical requirements applicable to fabrication and construction activities.
- Apply structured methods for inspecting base materials, consumables, and joint preparation before welding.
- Evaluate welding procedures and qualification requirements against project specifications and technical requirements.
- Apply systematic visual inspection techniques during and after welding activities.
- Analyze common welding defects and determine their characteristics, potential causes, and implications for joint integrity.
- Evaluate the appropriate non-destructive testing methods for different welded components and inspection requirements.
- Apply acceptance and rejection criteria to welding inspection results and document non-conformities accurately.
- Analyze the root causes of recurring welding defects and develop appropriate corrective and preventive actions.
- Improve coordination between welding, inspection, quality, engineering, fabrication, and production teams.
- Evaluate welding inspection records and reports for technical accuracy, completeness, and traceability.
- Develop a practical welding inspection and quality control improvement plan by the end of the course.

Who Should Attend

This training course is designed for welding inspectors, welding engineers, quality engineers, inspection engineers, fabrication engineers, production engineers, and professionals involved in quality assurance and quality control. It is also suitable for welding supervisors, fabrication supervisors, inspection personnel, non-destructive testing personnel, technicians, and professionals responsible for monitoring welding and fabrication activities.

The course is particularly relevant to professionals working in oil and gas, petrochemical, power generation, manufacturing, construction, engineering and contracting, heavy industry, utilities, and industrial maintenance. It is highly applicable to personnel involved in the fabrication and installation of pipelines, pressure equipment, storage tanks, structural steelwork, process equipment, and other welded components.

The program also benefits quality managers, inspection managers, fabrication managers, project managers, maintenance managers, quality assurance specialists, and quality control specialists responsible for reviewing welding documentation, monitoring inspection activities, ensuring compliance with technical requirements, and managing welding-related non-conformities. It is also suitable for engineers involved in improving welding quality and reducing defects and rework.

Learning Outcomes

- Explain the fundamental principles of welding processes and the factors influencing welded joint quality.
- Interpret engineering drawings, welding specifications, and technical requirements relevant to inspection activities.
- Evaluate base materials, welding consumables, and joint preparation before welding begins.
- Review welding procedures and verify their suitability against project and technical requirements.
- Conduct structured visual inspection of welded joints and document inspection findings.
- Identify common welding defects and distinguish their characteristics, causes, and potential effects.
- Select appropriate non-destructive testing methods according to joint type, material, and inspection requirements.
- Interpret welding inspection and examination results against defined acceptance criteria.
- Document welding non-conformities and establish appropriate follow-up and corrective actions.
- Apply root-cause analysis techniques to recurring welding quality problems.
- Evaluate welding inspection records, quality documentation, and traceability requirements.
- Develop a practical framework for improving welding inspection, quality control, defect prevention, and rework reduction.

Course Outline

DAY 01

Welding Fundamentals & Weld Quality Requirements

- Fundamentals of welding processes and factors influencing welded joint quality
- Types of welded joints, welding positions, and joint preparation requirements
- Base materials and welding consumables and their influence on weld quality
- Engineering drawings, welding specifications, procedures, and inspection requirements

PRACTICAL APPLICATION

Review a welded joint and identify material, preparation, welding, inspection, and quality requirements

DAY 02

Welding Process Control & Pre-Weld Inspection

- Pre-weld inspection requirements and inspection planning
- Verification of base materials, welding consumables, storage, handling, and identification
- Welding procedure requirements and welder qualification
- Joint preparation, alignment, cleanliness, root gap, and dimensional requirements

PRACTICAL APPLICATION

Develop and apply a pre-weld inspection checklist to a fabrication scenario

DAY 03

Visual Inspection & Non-Destructive Testing

- Principles and practices of visual inspection of welded joints
- Identification and classification of common welding discontinuities
- Principles and applications of non-destructive testing for welded components
- Liquid penetrant testing, magnetic particle testing, ultrasonic testing, and radiographic testing

DAY 03 — CONTINUED

PRACTICAL APPLICATION

Analyze inspection findings from multiple welded joints and identify appropriate examination methods

DAY 04

Weld Defect Evaluation & Quality Control

- Common welding defects, their causes, and their effects on weld integrity
- Acceptance and rejection criteria and interpretation of inspection requirements
- Non-conformity management, weld repair, and re-inspection
- Root-cause analysis of welding defects and defect prevention

PRACTICAL APPLICATION

Investigate a recurring welding defect, determine its root causes, and develop corrective and preventive actions

DAY 05

Welding Inspection Documentation & Quality Improvement

- Preparation of welding inspection reports, quality records, and technical documentation
- Review of welding quality files, material traceability, procedures, and inspection results
- Welding quality performance indicators, defect monitoring, and rework analysis
- Continuous improvement approaches for welding inspection and quality control

FINAL WORKSHOP

Develop an integrated welding inspection and quality control plan covering inspection points, documentation, acceptance criteria, non-conformity management, corrective actions, and improvement measures



Register or Request More Information

Course page: <https://quest-training.com/courses/welding-inspection-quality-control>

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