

ICTQual AB



Qualification Specification

ICTQual AB Level 2 Award in Pressure Vessels and Boiler Safety



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ICTQual AB's

Level 2 Award in Pressure Vessels and Boiler Safety

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Qualification Specification about

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About ICTQual AB's

ICTQual AB is a distinguished awarding body based in the United Kingdom, dedicated to fostering excellence in education, training, and skills development. Committed to global standards, ICTQual AB's provides internationally recognized qualifications that empower individuals and organizations to thrive in an increasingly competitive world. Their offerings span diverse industries, including technical fields, health and safety, management, and more, ensuring relevance and adaptability to modern workforce needs.

ICTQual AB's delivers high-quality educational solutions through a network of Approved Training Centres worldwide. Their robust standards and innovative teaching methodologies equip learners with practical knowledge and skills for personal and professional growth. With a mission to inspire lifelong learning and drive positive change, ICTQual AB's continuously evolves its programs to stay ahead of industry trends and technological advancements.

Course Overview

In the realm of industrial safety, the management of pressure vessels and boilers is a fundamental pillar of operational integrity. These systems play a vital role across industries such as manufacturing, energy generation, oil & gas, and chemical processing. Due to the high-risk nature of pressurised equipment, ensuring safe operation, inspection, and maintenance is essential to protect personnel, infrastructure, and the environment.

The ICTQual AB Level 2 Award in Pressure Vessels and Boiler Safety is a specialised industry-focused qualification designed to equip learners with essential safety knowledge, regulatory awareness, and practical competencies required for the safe handling and management of pressurised industrial equipment. The course emphasises hazard prevention, routine safety protocols, emergency preparedness, and compliance with internationally recognised safety standards.

Qualification Aim

- ✓ This qualification aims to develop a strong understanding of:
- ✓ Safe operating practices for boilers and pressure vessels
- ✓ Risk identification and mitigation techniques
- ✓ Legal and regulatory compliance requirements
- ✓ Inspection, maintenance, and emergency response procedures
- ✓ Learners completing this award will gain the competence to contribute effectively to workplace safety, ensuring pressure systems operate reliably and within safe limits.

Learning Objectives

By the end of the course, learners will be able to:

- ✓ Understand the function, types, and components of pressure vessels and boiler systems
- ✓ Identify common safety hazards associated with pressurised equipment
- ✓ Apply safe operating and shutdown procedures
- ✓ Recognise inspection and maintenance requirements to prevent equipment failure
- ✓ Demonstrate awareness of relevant safety legislation, codes, and compliance obligations
- ✓ Respond appropriately to emergency situations including pressure leaks, overheating, and explosions
- ✓ Promote safety culture and safe behaviour when working around pressure systems

Course Outcomes

Upon completion, learners will gain:

- ✓ Practical knowledge of safe pressure system operations
- ✓ Ability to detect early warning signs of malfunction or unsafe pressure conditions
- ✓ Understanding of safety valves, gauges, venting systems, and protection devices
- ✓ Awareness of preventive maintenance and routine safety checks
- ✓ Confidence to support workplace compliance and risk-reduction strategies

Targeted Audience

This qualification is designed for:

- ✓ Boiler and plant operators
- ✓ Maintenance assistants and technicians
- ✓ Site supervisors and safety representatives
- ✓ Factory and plant floor personnel
- ✓ New entrants in industrial environments where pressure systems are used
- ✓ Individuals seeking formal recognition in boiler and pressure safety awareness

Certification Framework

Qualification title	ICTQual AB Level 2 Award in Pressure Vessels and Boiler Safety
Course ID	HSE0002
Total Qualification Time	10
Guided Learning Hours	5
Grading Type	Pass / Fail
Competency Evaluation Assessment	Coursework / Assignments / Verifiable Experience The assessment and verification process for ICTQual AB's qualifications involves two key stages: Internal Assessment and Verification: ✓ Conducted by the staff at the Approved Training Centre (ATC) to ensure learners meet the required standards through continuous assessments. ✓ Internal Quality Assurance (IQA) is carried out by the centre's IQA staff to validate the assessment process. External Quality Assurance: ✓ Managed by ICTQual AB's verifiers, who periodically review the centre's assessment and IQA processes. Verifies that assessments are conducted to the required standards and ensures consistency across centres

Entry Requirements

To enrol in ICTQual AB Level 2 Award in Pressure Vessels and Boiler Safety, learner must meet the following entry requirements:

- ✓ **Age Requirement:** Learners must be at least 19 years old at the time of registration.
- ✓ **Educational Background:** A Level 1 Award in Pressure Vessels and Boiler Safety or an equivalent introductory qualification is recommended. Learners with basic secondary education and a strong interest in industrial safety may also be considered.
- ✓ **Professional Experience:** No prior work experience is strictly required. However, learners with experience in maintenance, engineering, industrial operations, or health and safety roles will benefit from the course.
- ✓ **English Proficiency:** As the course is delivered in English, learners should have adequate reading, writing, and communication skills. A minimum of CEFR Level B1 (or equivalent) is recommended to engage effectively with course materials and assessments.
- ✓ **Additional Requirement:** Learners are expected to have a genuine interest in industrial safety, hazard management, and operational best practices, with the motivation to apply safety knowledge in practical work environments.

Qualification Structure

This qualification comprises 7 mandatory units. Candidates must successfully complete all mandatory units to achieve the qualification.

Mandatory Units	
Unit Ref#	Unit Title
HSE0002-01	Advanced Technical Knowledge
HSE0002-02	Regulatory Compliance and Standards
HSE0002-03	Risk Management and Safety Strategies
HSE0002-04	Emergency Response and Incident Investigation
HSE0002-05	Advanced Inspection and Testing Methods
HSE0002-06	Advanced Documentation and Compliance Management
HSE0002-07	Safety Culture and Leadership

Centre Requirements

To ensure quality training delivery, centres must adhere to the following standards:

1. Centre Approval

- ✓ Centres must be formally approved by ICTQual AB's before delivering this qualification.
- ✓ Approval involves a review of facilities, policies, and staff qualifications.

2. Qualified Staff

- ✓ **Tutors:** Must hold a Level 6 or higher qualification (Bachelor's, Master's, or equivalent) in a relevant technical or safety field such as Mechanical, Chemical, Process, Power/Energy Engineering, Occupational/Industrial Health & Safety, or Boiler and Pressure Equipment Inspection certifications (ASME/API/OSHA/NDT or equivalent), with practical industry safety experience.
- ✓ **Assessors:** Must hold a recognized assessor qualification (e.g., CAVA, AVRA) or equivalent)
- ✓ **Internal Quality Assurers (IQAs):** Must hold a recognized IQA qualification (e.g. Level 4 Award in the IQA and Level 4 Certificate in Leading the IQA) and experience to oversee assessment standards.

3. Learning Facilities

Centre must offer:

- ✓ Private study areas and internet-enabled workspaces (for blended or physical delivery)
- ✓ Academic and pastoral support for learners
- ✓ Administrative support must be available to manage enrolment, tracking, and learner queries efficiently

4. Health and Safety Compliance

- ✓ All training facilities must comply with health and safety regulations.

- ✓ Centres must conduct regular risk assessments for practical activities.

5. Learning Resources

- ✓ **Course Materials:** Approved textbooks, study guides, and digital content must align with the qualification standards.
- ✓ **Assessment Tools:** Templates and guidelines must be provided to ensure standardized evaluation processes.
- ✓ **E-Learning Support:** Centres offering online or blended learning must implement an effective Learning Management System (LMS).

6. Assessment and Quality Assurance

- ✓ Centres must ensure assessments meet ICTQual AB's competency standards.
- ✓ Internal quality assurance (IQA) must be conducted to maintain consistency.
- ✓ External verifiers from ICTQual AB's will review assessment and training practices.

7. Learning Support

- ✓ **Qualification Guidance:** Support for coursework and assignments.
- ✓ **Career Pathway Assistance:** Information on progression opportunities in sustainability and energy sectors.
- ✓ **Accessibility Support:** Accommodations for learners with disabilities or language barriers.

8. Policies and Compliance

Centres must uphold the following policies in accordance with ICTQual AB's standards:

- ✓ Equality, Diversity, and Inclusion Policy.
- ✓ Health and Safety Policy.
- ✓ Safeguarding and Learner Protection Policy.
- ✓ Complaints and Appeals Procedure.
- ✓ Data Protection and Confidentiality Policy.

9. Reporting Requirements

- Centres must provide ICTQual AB's with regular reports on learner registrations, progress, and certification outcomes.
- Assessment records must be maintained for external auditing and quality assurance purposes.

Support for Candidates

Centres should ensure that materials developed to support candidates:

- ✓ Facilitate tracking of achievements as candidate's progress through the learning outcomes and assessment criteria.
- ✓ Include information on how and where ICTQual AB's policies and procedures can be accessed.
- ✓ Provide mechanisms for Internal and External Quality Assurance staff to verify and authenticate evidence effectively.

This approach ensures transparency, supports candidates' learning journeys, and upholds quality assurance standards.

Assessment

This qualification is competence-based, requiring candidates to demonstrate proficiency as defined in the qualification units. The assessment evaluates the candidate's skills, knowledge, and understanding against the set standards. Key details include:

1. Assessment Process:

- ✓ Must be conducted by an experienced and qualified assessor.
- ✓ Candidates compile a portfolio of evidence that satisfies all learning outcomes and assessment criteria for each unit.

2. Types of Evidence:

- ✓ Observation reports by the assessor.
- ✓ Assignments, projects, or reports.
- ✓ Professional discussions.
- ✓ Witness testimonies.
- ✓ Candidate-produced work.
- ✓ Worksheets.
- ✓ Records of oral and written questioning.
- ✓ Recognition of Prior Learning (RPL).

3. Learning Outcomes and Assessment Criteria:

- ✓ **Learning Outcomes:** Define what candidates should know, understand, or accomplish upon completing the unit.
- ✓ **Assessment Criteria:** Detail the standards candidates must meet to demonstrate that the learning outcomes have been achieved.

This framework ensures rigorous and consistent evaluation of candidates' competence in line with the qualification's objectives.

Unit Descriptors

HSE0002-01- Advanced Technical Knowledge

Covers key boiler and pressure vessel facts, components, and routine operating procedures. Learners interpret relevant technical safety information and select practical skills to complete well-defined, generally routine safety tasks responsibly, addressing straightforward operational problems under guidance, while collaborating in teams when required.

Learning Outcome:	Assessment Criteria:
1. Demonstrate an understanding of advanced principles governing pressure vessel and boiler design.	1.1 Identify the main components of a pressure vessel and their specific functions. 1.2 Describe how internal pressure affects the shape and thickness of vessel walls. 1.3 List the basic formulas used to calculate safe working pressures in routine designs.
2. Evaluate materials selection and their impact on performance and safety.	2.1 Identify common metals used in boiler construction, such as carbon steel and stainless steel. 2.2 Explain how temperature changes can affect the strength of chosen materials. 2.3 Select the correct material for a specific task based on its resistance to corrosion. 2.4 Describe the consequences of using incorrect or low-grade materials in high-pressure systems.
3. Apply advanced techniques for thermal stress, fatigue, and load calculations.	3.1 Calculate the expansion of a boiler pipe when subjected to standard heat increases. 3.2 Identify areas in a pressure system where fatigue (wear from repeated use) is likely to occur.
4. Implement appropriate welding methods for safe fabrication.	4.1 Select the correct welding process (e.g., TIG or MIG) for a routine repair task. 4.2 Follow a standard Welding Procedure Specification (WPS) to complete a joint. 4.3 Identify common welding defects, such as cracks or bubbles, using visual inspection. 4.4 List the safety equipment required when performing welding tasks on a boiler. 4.5 Explain the importance of cleaning surfaces before starting the welding process.

- 5. **Analyse operational parameters to optimise efficiency and minimise risks.**
 - 5.1 Monitor pressure and temperature gauges to ensure they stay within "green" safety zones.
 - 5.2 Adjust fuel or water flow to correct a minor change in boiler performance.

HSE0002-02- Regulatory Compliance and Standards

Introduces relevant pressure system regulations and routine safety standards. Learners interpret compliance information, identify and gather relevant safety records, and apply cognitive and practical compliance skills responsibly to complete well-defined tasks, addressing straightforward regulatory problems collaboratively under overall guidance.

Learning Outcome:	Assessment Criteria:
1. Interpret and apply complex regulatory requirements related to pressure vessel and boiler safety.	1.1 State the main purpose of national health and safety laws regarding pressure systems. 1.2 Identify which local regulations apply to a specific piece of equipment in the workplace. 1.3 Follow a checklist to ensure a boiler meets the legal requirements for daily operation.
2. Analyse key industry standards, including ASME Boiler and Pressure Vessel Code and European Pressure Equipment Directive.	2.1 Locate specific safety symbols and labels required by the ASME or PED standards. 2.2 Explain the difference between a "standard" and a "law" in simple terms. 2.3 Identify the certification marks (like the CE or UKCA mark) required on new vessels. 2.4 Use a standard handbook to find the testing interval for a safety valve.
3. Ensure adherence to international codes, directives, and safety regulations during design, construction, and operation.	3.1 Check that a vessel's nameplate matches the technical data in its manual. 3.2 List the international safety codes that must be followed for cross-border equipment.
4. Assess regulatory implications for modifications, repairs, and maintenance of pressure vessels and boilers.	4.1 Identify when a repair requires a "notified body" or an external inspector to visit. 4.2 List the documents that must be updated after a major repair is finished. 4.3 Explain why unauthorized modifications can lead to a loss of safety certification. 4.4 Describe the process for getting approval for a straightforward equipment change. 4.5 Follow a standard procedure to notify authorities of a planned maintenance shutdown.

5. Develop strategies to maintain compliance during operational audits and inspections.

- 5.1 Organise safety certificates and maintenance logs so they are ready for an inspector.
- 5.2 Participate in a mock inspection to identify missing safety signs or documents.

HSE0002-03- Risk Management and Safety Strategies

Develops awareness of common boiler and pressure equipment risks. Learners interpret relevant risk information, gather basic safety data, select routine mitigation skills, take responsibility for well-defined safety tasks, address straightforward safety problems, and collaborate in work teams while exercising judgement under guidance.

Learning Outcome:	Assessment Criteria:
1. Conduct advanced risk assessments to identify and mitigate potential hazards in pressure vessel and boiler operations.	1.1 Identify three common hazards found near a working boiler (e.g., heat, leaks, noise). 1.2 Use a simple 5x5 grid to rate the risk of a identified hazard. 1.3 Suggest a "control measure" (like a guard or sign) to make a task safer.
2. Apply reliability engineering and safety management principles to enhance operational safety.	2.1 Identify "fail-safe" features on a boiler, such as a pressure relief valve. 2.2 Explain why regular oiling and cleaning prevent equipment failure. 2.3 Follow a planned maintenance schedule to ensure equipment stays reliable. 2.4 Report any "near-miss" events to a supervisor to help improve safety.
3. Implement preventative measures and strategies to reduce the likelihood of incidents.	3.1 Place clear warning signs in areas where high-pressure steam is present. 3.2 Ensure all safety locks (Lock-out/Tag-out) are in place before starting work.
4. Evaluate hazardous areas and determine appropriate safety instrumentation and controls.	4.1 Identify the boundaries of a "restricted zone" around a high-pressure vessel. 4.2 Select the correct Personal Protective Equipment (PPE) for entering a boiler room. 4.3 Test an emergency stop button to ensure it functions correctly. 4.4 Identify the location of the nearest fire extinguisher and first aid kit. 4.5 Describe how a pressure sensor can automatically shut down a system if it gets too hot.

- 5. **Develop proactive procedures to monitor and control operational risks effectively.**
 - 5.1 Complete a daily safety walk-around using a standard observation form.
 - 5.2 Record any unusual noises or vibrations in the daily logbook for review.

HSE0002-04- Emergency Response and Incident Investigation

Develops awareness of common boiler and pressure equipment risks. Learners interpret relevant risk information, gather basic safety data, select routine mitigation skills, take responsibility for well-defined safety tasks, address straightforward safety problems, and collaborate in work teams while exercising judgement under guidance.

Learning Outcome:	Assessment Criteria:
1. Lead emergency response operations for incidents involving pressure vessels and boilers.	1.1 Sound the alarm correctly when a major leak is discovered. 1.2 Direct team members to the nearest assembly point during a drill. 1.3 Use a radio or phone to report an emergency to the control room clearly.
2. Apply incident command principles to manage emergency situations efficiently.	2.1 Identify who is in charge during an emergency according to the site plan. 2.2 Follow the "chain of command" when receiving instructions during a crisis. 2.3 Clear a work area of non-essential staff during a minor incident. 2.4 Assist emergency services by providing them with the equipment's location.
3. Conduct root cause analysis to determine underlying causes of failures or accidents.	3.1 Gather physical evidence, such as a broken valve, after a failure. 3.2 Interview witnesses to find out exactly what happened before the incident.
4. Develop corrective and preventive action plans to avoid recurrence of incidents.	4.1 Suggest one change to a work task to prevent a similar accident from happening again. 4.2 Identify the training needs for staff following a mistake in operation. 4.3 Update a "Safe System of Work" document based on lessons learned. 4.4 Check that a new safety guard has been installed correctly after an incident. 4.5 Follow up after one week to ensure new safety rules are being followed.

- 5. **Communicate findings and improvements effectively to management and operational teams.**
 - 5.1 Write a short, clear summary of what caused a minor equipment failure.
 - 5.2 Present safety findings at a "toolbox talk" or team meeting.

HSE0002-05- Advanced Inspection and Testing Methods

Builds understanding of routine inspection steps and basic testing procedures for pressure systems. Learners interpret relevant inspection information, gather test data, apply cognitive and practical inspection skills responsibly, complete well-defined routine tasks, address straightforward inspection problems, and collaborate under guidance.

Learning Outcome:	Assessment Criteria:
1. Utilise advanced non-destructive testing techniques, including ultrasonic testing and radiography.	1.1 Identify when to use Ultrasonic Testing (UT) versus Dye Penetrant Testing. 1.2 Prepare the surface of a metal plate for a liquid penetrant test. 1.3 Read a simple NDT report to identify if a weld passed or failed.
2. Implement inspection procedures to assess integrity and detect potential faults in pressure vessels and boilers.	2.1 Use a flashlight and mirror to perform a visual inspection of a boiler interior. 2.2 Identify signs of "pitting" or surface corrosion on a vessel wall. 2.3 Measure the thickness of a pipe using a handheld digital gauge. 2.4 Follow a step-by-step checklist provided by an insurance inspector.
3. Apply condition monitoring strategies to identify early signs of wear, fatigue, or damage.	3.1 Record temperature readings over a shift to check for "hot spots." 3.2 Use a vibration pen to check if a pump is running smoothly.
4. Conduct fitness-for-service evaluations to determine safe operational lifespan.	4.1 Compare current wall thickness measurements against the original design thickness. 4.2 Identify if a vessel can continue running or needs immediate repair based on a chart. 4.3 State the date for the next required "Statutory Inspection." 4.4 List the conditions (like a leak) that would require a vessel to be shut down early. 4.5 Explain how "service life" is shortened by running a boiler at maximum capacity.

- 5. **Maintain accurate inspection records and reports to support ongoing safety management.**
 - 5.1 File NDT results in the correct folder for each specific vessel.
 - 5.2 Fill out a "Report of Inspection" form without leaving any sections blank.

HSE0002-06- Advanced Documentation and Compliance Management

Introduces routine safety documentation and record-keeping procedures. Learners interpret relevant compliance information, identify and gather relevant safety documents, apply practical documentation skills responsibly, complete well-defined routine tasks, address straightforward documentation problems, and collaborate in teams under guidance.

Learning Outcome:	Assessment Criteria:
1. Develop and maintain detailed documentation systems to meet regulatory requirements.	1.1 Create a folder system for storing "Manufacturer's Data Reports." 1.2 Ensure every piece of equipment has a unique ID number in the system. 1.3 Check that all instruction manuals are the most recent versions.
2. Manage compliance audits and inspections effectively, ensuring adherence to standards.	2.1 Act as a guide for an external inspector, showing them the required equipment. 2.2 Provide the inspector with the specific maintenance logs they ask for. 2.3 Note down any "non-conformities" (faults) found by the auditor during the walk. 2.4 Ensure all tools used for testing have a current calibration sticker.
3. Compile and present regulatory reports accurately and within required timelines.	3.1 Draft a monthly report listing all safety tests completed. 3.2 Submit a "Notice of Repair" to the safety department on time.
4. Implement best practices for documentation management to support operational safety.	4.1 Use a "Log-out" sheet to track who has borrowed a technical manual. 4.2 Backup digital safety records to a secure drive or cloud system. 4.3 Label physical files clearly so any team member can find them quickly. 4.4 Destroy or archive old, out-of-date safety procedures to avoid confusion. 4.5 Ensure that all handwritten entries in logbooks are legible and signed.

5. Monitor compliance trends and recommend improvements to maintain safety standards.

- 5.1 Count the number of minor leaks reported each month to see if they are increasing.
- 5.2 Suggest a better way to store paper records to prevent them from getting dirty.

HSE0002-07- Safety Culture and Leadership

Builds awareness of safety responsibility and teamwork in industrial environments. Learners interpret relevant safety information, identify effective safety actions, take ownership of routine safety tasks, address straightforward safety problems, exercise judgement under guidance, and collaborate within work groups to support workplace safety culture.

Learning Outcome:

1. **Promote a positive safety culture within the organisation, emphasising accountability and responsibility.**
2. **Demonstrate leadership in safety initiatives and encourage team engagement in safe practices.**
3. **Empower employees to actively participate in safety programs and continuous improvement.**
4. **Develop strategies to enhance organisational safety awareness and practices.**

Assessment Criteria:

- 1.1 Lead by example by always wearing the correct PPE in the boiler house.
- 1.2 Explain to a new colleague why it is important to report even small leaks.
- 1.3 Challenge a team member if you see them performing a task unsafely.
- 2.1 Volunteer to be the "Safety Representative" for your work group.
- 2.2 Start every shift meeting with a 2-minute "Safety Tip."
- 2.3 Help a supervisor organize a safety demonstration for the team.
- 2.4 Encourage colleagues to suggest ways to make a routine task easier and safer.
- 3.1 Show a teammate how to use the "Hazard Reporting" app or form.
- 3.2 Invite feedback from the team on a new safety tool or piece of PPE.
- 4.1 Create a simple poster showing the "Top 5 Safety Rules" for the boiler room.
- 4.2 Organize a "Safety Quiz" to help the team remember emergency procedures.
- 4.3 Identify a "Safety Champion" in each department to help spread information.
- 4.4 Check that safety noticeboards are updated with the latest accident statistics.
- 4.5 Suggest a "Safety Award" for the team member with the best safety record.

- 5. Evaluate and improve safety processes to foster a culture of excellence and continuous improvement.
 - 5.1 Review a safety procedure with the team to see if any steps are confusing.
 - 5.2 Identify one way to make the emergency exit route clearer to follow.

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