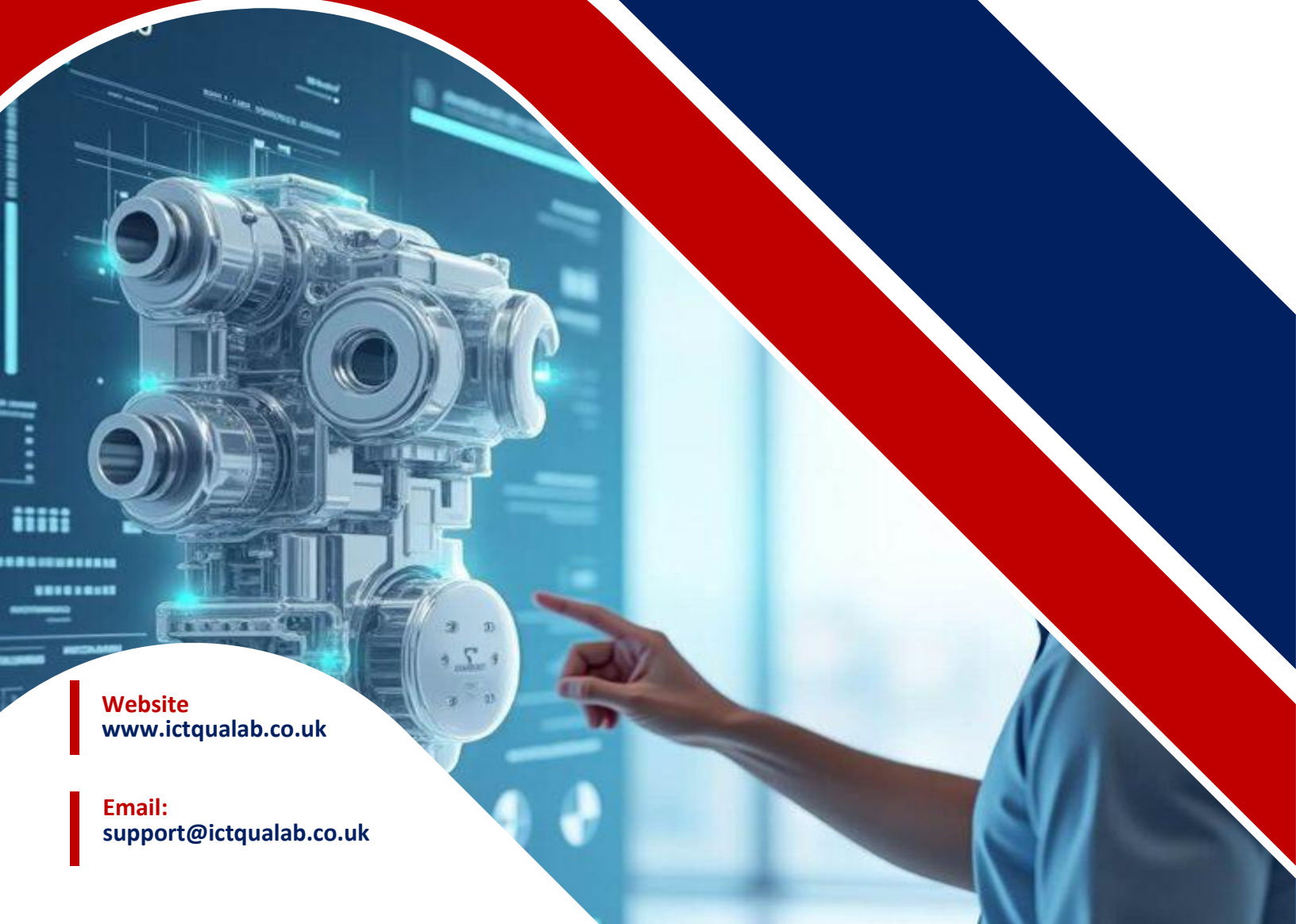
ICTQual AB

Qualification Specification

ICTQual AB Level 3 Diploma in Quality Control Mechanical



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ICTQual AB's

Level 3 Diploma in Quality Control Mechanical

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Qualification Specification about

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About ICTQual AB

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

The ICTQual AB Level 3 Diploma in Quality Control – Mechanical provides learners with essential knowledge and hands-on competence in the field of mechanical quality assurance and inspection. This qualification focuses on the implementation of effective inspection procedures, dimensional verification techniques, and compliance with industry standards to ensure the quality, reliability, and safety of mechanical systems and components. Grounded in clearly defined standards and objectives, the course covers a wide range of key areas, including defect identification, use of mechanical measurement tools, understanding of codes and compliance requirements, and preparation of inspection documentation. Learners are trained to assess product conformity, interpret engineering specifications, and carry out structured quality control checks across different mechanical environments. The programme supports the development of practical and theoretical skills required for quality-focused roles in mechanical industries such as manufacturing, fabrication, and maintenance.

Course Aim

The aim of this diploma is to prepare competent and responsible quality control practitioners who can confidently carry out inspections, use precision measurement equipment, and apply relevant mechanical standards and compliance procedures to maintain and improve quality outcomes in mechanical systems.

Target Audience:

This course is intended for individuals who wish to build technical and practical skills in mechanical quality control, including:

- Entry-level technicians and junior inspectors in mechanical quality environments
- Skilled operatives or tradespersons seeking structured quality assurance training
- School leavers or vocational learners interested in mechanical inspection roles
- Individuals aiming to shift from general mechanical roles into quality-focused positions
- Employees responsible for maintaining product quality in fabrication or assembly units

It is suitable for learners who need formal recognition of their competence in applying quality standards, measurement practices, and inspection documentation.

Course Objectives

Upon successful completion of the qualification, learners will be able to:

- **Understand Core Principles of Mechanical Quality Control**

Demonstrate knowledge of mechanical quality control principles, including defect identification, inspection processes, and the importance of maintaining system integrity.

- **Apply Mechanical Inspection Techniques**

Execute accurate and thorough inspections of mechanical components and systems using appropriate procedures and protocols.

- **Use Precision Measurement Tools Effectively**

Operate mechanical measurement instruments such as calipers, micrometers, dial indicators, and gauges with confidence and accuracy.

Certification Framework

Qualification title	**ICTQual AB Level 3 Diploma in Quality Control Mechanical**
Course ID	QC0012
Grading Type	Pass / Fail
Competency Evaluation	Coursework / Assignments / Verifiable Experience
Assessment	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 enroll in the ICTQual AB Level 3 Diploma in Quality Control Mechanical, learners must meet the following requirements:

- **Minimum Age:** Learners must be 18 years of age or older.
- **Educational Background:** A secondary school certificate or equivalent qualification is recommended. A foundation in mechanical, science, or technical studies is beneficial.
- **Industry Experience:** Prior experience is not mandatory, but learners with hands-on exposure in mechanical maintenance, fabrication, or inspection are encouraged.
- **English Language Skills:** Learners should have basic proficiency in reading and writing in English to effectively understand the course material and complete assessments.
- **Health and Safety Awareness:** A keen interest in quality control procedures and a strong commitment to safety standards are essential for success in this field.
- **Physical and Technical Readiness:** Basic physical capability to work in technical environments, along with an interest in tools, equipment, and inspection processes is advantageous.

These requirements help ensure that learners are fully prepared to gain practical skills, technical knowledge, and internationally recognised competence in mechanical quality control.

Qualification Structure

This qualification comprises 6 mandatory units. Candidates must successfully complete all mandatory units to achieve the qualification.

Mandatory Units	
Unit Ref#	**Unit Title**
QC0012 - 01	Principles of Mechanical Quality Assurance
QC0012 - 02	Use of Gauges, Calipers, Micrometers, and Non-Destructive Testing (NDT) Methods
QC0012 - 03	Material Properties and Defect Identification in Mechanical Components
QC0012 - 04	Inspection Procedures for Fabrication, Welding, and Machining
QC0012 - 05	Documentation and Reporting in Mechanical Quality Control
QC0012 - 06	Workplace Health and Safety in Mechanical Quality Environments

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 possess relevant academic qualifications (minimum Level 4) and professional experience in mechanical engineering, inspection, or quality control.
- ✓ **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

QC0012-01- Principles of Mechanical Quality Assurance

This unit introduces learners to the basic ideas behind quality assurance in mechanical work. It explains why quality matters in manufacturing and engineering, and how good quality helps prevent faults, save money, and protect users. Learners will study how quality systems are planned, controlled, and improved over time. The unit covers the role of quality assurance teams, quality standards, and the importance of following clear procedures. Learners will also learn how to support continuous improvement in mechanical processes and how quality assurance links with inspection and testing.

Learning Outcome:	Assessment Criteria:
1. **Understand the fundamental principles of quality assurance in mechanical engineering.**	1.1 Describe the purpose of a quality assurance system. 1.2 Explain the roles of key personnel in a quality assurance team. 1.3 List three core principles of quality assurance in a manufacturing setting. 1.4 Explain the importance of a systematic approach to quality. 1.5 Identify the benefits of applying quality assurance principles to a product.
2. **Learn the differences between quality control and quality assurance processes.**	2.1 State a key difference between quality control and quality assurance. 2.2 Provide a practical example of a quality control activity. 2.3 Provide a practical example of a quality assurance activity. 2.4 Describe how quality control and quality assurance processes work together.
3. **Apply industry-standard methodologies to monitor and maintain product quality.**	3.1 Choose a suitable industry-standard methodology for a given scenario. 3.2 Describe the steps involved in a selected quality monitoring methodology. 3.3 Explain how to maintain consistent product quality using a chosen method. 3.4 Provide a brief explanation of how to record results from the chosen method.

4. Identify quality benchmarks and their importance in mechanical production.	4.1 Name three common quality benchmarks used in mechanical production. 4.2 Explain the purpose of using quality benchmarks. 4.3 Describe how to measure a product against a specific quality benchmark. 4.4 Explain how to use benchmarks to improve production processes.

QC0012-02- Use of Gauges, Calipers, Micrometers, and Non-Destructive Testing (NDT) Methods

This unit teaches learners how to correctly use common measurement tools and testing techniques in mechanical quality control. Learners will gain practical knowledge about using gauges, calipers, and micrometers to take accurate measurements. The unit also introduces non-destructive testing (NDT) methods such as ultrasonic, magnetic particle, dye penetrant, and visual inspection. These methods help check for faults in materials and parts without causing damage. Learners will understand when and how to use each tool or method safely and correctly to check the quality of mechanical components.

Learning Outcome:	Assessment Criteria:
1. Gain practical skills in using mechanical measurement tools such as calipers and micrometers.	1.1 Demonstrate the correct and safe use of a vernier caliper. 1.2 Show how to read a measurement accurately from a micrometer. 1.3 Explain how to handle and store precision tools to prevent damage. 1.4 Take and record a series of measurements from a component.
2. Understand the selection and calibration of precision gauges.	2.1 Explain the factors that affect the choice of a specific gauge. 2.2 Describe the procedure for checking the calibration of a gauge. 2.3 Explain why regular calibration is essential for accurate measurement. 2.4 Identify a situation where an out-of-calibration gauge would lead to a problem. 2.5 State the frequency for calibrating a specified gauge.
3. Learn the fundamentals of Non-Destructive Testing (NDT) techniques.	3.1 Name three common NDT methods. 3.2 Describe the basic principle behind one of the named NDT methods. 3.3 Explain the advantages of using NDT over destructive testing. 3.4 Identify the type of defect each NDT method is best suited for finding.

4. Apply NDT methods to evaluate component integrity without damaging the material.	4.1 Choose an appropriate NDT method for a specific component and potential defect. 4.2 Describe the procedural steps for conducting the chosen NDT method. 4.3 Record and report the findings from a simulated NDT inspection. 4.4 Explain how the NDT results are used to determine if a component is safe to use.

QC0012-03- Material Properties and Defect Identification in Mechanical Components

This unit helps learners understand the basic properties of materials used in mechanical work, such as strength, hardness, and flexibility. Learners will explore how materials behave under different conditions and how these properties affect performance and safety. The unit also covers how to recognise common defects like cracks, porosity, or deformation in metals and mechanical parts. Learners will develop skills in identifying the causes of defects and understanding how they impact product quality and reliability.

Learning Outcome:	Assessment Criteria:
1. **Understand key mechanical properties such as tensile strength, hardness, and ductility.**	1.1 Define tensile strength and explain its significance. 1.2 Describe how hardness is measured. 1.3 Explain what ductility means and provide a practical example. 1.4 Describe how these properties affect a component's performance.
2. **Identify common material defects and their causes in mechanical parts.**	2.1 List four common material defects found in mechanical parts. 2.2 Provide a possible cause for each of the listed defects. 2.3 Describe the visual appearance of a specific type of defect. 2.4 Explain how a material defect can lead to component failure. 2.5 State the importance of identifying defects early in the production process.
3. **Evaluate materials for suitability in specific applications based on their properties.**	3.1 Match a specific material to an application based on its properties. 3.2 Explain why a material's properties make it suitable or unsuitable for a given use. 3.3 Describe how to check if a material meets the required specifications for a project. 3.4 Choose an alternative material for an application if the primary material is not available.

4. Apply inspection techniques to detect early signs of failure or degradation.	4.1 Describe a visual inspection technique to check for signs of degradation. 4.2 Explain how to use a basic tool, like a magnifying glass, to find small defects. 4.3 Identify a component that shows early signs of wear and tear. 4.4 List the steps to follow after detecting a sign of degradation. 4.5 Explain why early detection of degradation is important.

QC0012-04- Inspection Procedures for Fabrication, Welding, and Machining

In this unit, learners will study how mechanical products are checked during and after fabrication, welding, and machining. It explains inspection steps for each process and the tools used to make sure work meets required standards. The unit covers visual inspections, dimensional checks, surface finish checks, and weld inspections. Learners will learn how to follow checklists, interpret technical drawings, and apply quality control measures to detect faults and confirm that products are made to specification.

Learning Outcome:	Assessment Criteria:
1. **Learn standard inspection procedures for mechanical fabrication and welding operations.**	1.1 Describe the pre-welding inspection steps. 1.2 Explain the checks conducted during the welding process. 1.3 Describe the post-welding inspection activities. 1.4 List the documentation required for a welding inspection.
2. **Understand how to inspect machined components for dimensional accuracy and finish.**	2.1 Match a given welding symbol to its corresponding weld type. 2.2 Explain the meaning of key elements in a welding symbol. 2.3 Describe how to locate a specific feature on an engineering drawing. 2.4 State the purpose of a weld inspection drawing.
3. **Develop the ability to interpret welding symbols and inspection drawings.**	3.1 Read welding symbols in accordance with international standards. 3.2 Identify types of welds and required inspection points on a drawing. 3.3 Translate drawing information into inspection tasks and sequences. 3.4 Cross-reference inspection results with engineering tolerances.
4. **Identify common defects in fabrication and machining, including cracks, warping, and misalignment.**	4.1 Name three common defects in fabrication or machining. 4.2 Describe how to visually check for cracks in a welded joint. 4.3 Explain how warping can be detected in a fabricated component. 4.4 Explain the significance of a dimensional misalignment. 4.5 Provide a possible cause for a misalignment defect.

QC0012-05- Documentation and Reporting in Mechanical Quality Control

This unit focuses on the importance of keeping clear and accurate records in quality control. Learners will practise how to fill out inspection reports, measurement records, defect logs, and corrective action forms. The unit explains the need for traceability and how proper documentation supports quality audits and decision-making. Learners will also explore how to write clear, professional reports that describe inspection results and suggest improvements or actions needed when faults are found.

Learning Outcome:	Assessment Criteria:
1. **Understand the importance of accurate documentation in quality control operations.**	1.1 Explain why a quality control report must be accurate. 1.2 Describe the consequences of poor documentation. 1.3 List three types of documents used in mechanical quality control. 1.4 Explain how proper documentation supports product traceability.
2. **Learn how to prepare and complete inspection reports and quality records.**	2.1 Fill out a sample inspection report with accurate data. 2.2 Describe the key sections of a quality record. 2.3 Explain the purpose of a sign-off or approval section on a report. 2.4 List the information that must be included in a complete inspection report.
3. **Develop skills in data collection, analysis, and trend monitoring.**	3.1 Collect data from a series of component measurements. 3.2 Create a simple chart or graph from the collected data. 3.3 Identify a trend in the data, such as a shift in measurement. 3.4 Explain how monitoring trends helps to improve quality. 3.5 Explain how to identify an outlier in a data set.

4. **Apply best practices for communicating inspection findings clearly and professionally.**

4.1 Write a clear and concise summary of inspection findings.
4.2 Explain a defect to a colleague using simple and direct language.
4.3 Describe the format for a formal inspection report.
4.4 Identify the key audience for an inspection report.

QC0012-06- Workplace Health and Safety in Mechanical Quality Environments

This unit introduces learners to key health and safety rules in mechanical quality control settings. It explains common risks found in workshops, such as sharp tools, hot surfaces, heavy equipment, and hazardous materials. Learners will study how to use personal protective equipment (PPE), follow safety signs, and report unsafe conditions. The unit also covers safe handling of tools, proper lifting methods, and emergency procedures. Learners will understand their responsibilities for keeping themselves and others safe while carrying out quality control tasks.

Learning Outcome:	Assessment Criteria:
1. Recognise potential hazards in mechanical inspection and quality control settings.	1.1 List three specific hazards in a mechanical workshop. 1.2 Explain the risks associated with moving machinery. 1.3 Identify a potential chemical hazard and its related safety precautions. 1.4 Describe how to spot a tripping hazard. 1.5 Name a noise-related hazard in a workshop.
2. Apply health and safety regulations relevant to mechanical environments.	2.1 Explain the importance of following safety signs and labels. 2.2 Describe the correct procedure for lifting a heavy object. 2.3 Name a specific health and safety regulation relevant to mechanical inspection. 2.4 Explain how to handle and dispose of hazardous waste.
3. Use personal protective equipment (PPE) correctly during quality inspections.	3.1 Name a specific type of PPE for eye protection. 3.2 Explain the correct way to wear safety gloves for a task. 3.3 Describe the use of steel-toed boots in a workshop environment. 3.4 State when it is necessary to use hearing protection.
4. Promote a safety-first culture while maintaining inspection accuracy and efficiency.	4.1 Describe how to report a safety concern without delay. 4.2 Explain the role of teamwork in maintaining a safe workplace. 4.3 Suggest a way to improve safety during a specific inspection task. 4.4 Explain how a focus on safety does not need to compromise quality.

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