



ETCAL Level 1 NVQ Certificate in Performing Engineering Operations
601/1793/X
Assessment Guide

Introduction

ETA qualifications are developed in conjunction with the industries and employers they service. They are designed to add value and deliver multidimensional outputs that provide impact for both learners and employers.

It is therefore important that the assessment requirements of ETA qualifications are robust whilst not containing unnecessary and over-burdensome challenges that detract from the intended outcomes and impact.

Who is the qualification for?

This qualification has been designed to cover those learners who are either:

- acquiring engineering competencies in a realistic, sheltered and controlled environment, or
- employed but require additional engineering competencies as part of an existing job role or to enable career progression.

Learner entry requirements

There are no formal entry requirements for learners undertaking this qualification. However, centres must ensure that learners have the potential and opportunity to gain the qualification successfully.

Age restrictions

This qualification is not approved for use by learners under the age of 16, and ETA cannot accept any registrations for learners in this age group.

What does the qualification cover?

Mandatory units cover those areas which have a common approach such as organisational safety requirements, team working and using technical information. There is 1 optional pathway offering a choice of units applicable to individual workplaces and working environments.

Unit Endorsement

These units are endorsed by the Sector Skills Council for Science, Engineering and Manufacturing Technologies (SEMTEA).

Centre & Qualification Approval

Centres wishing to offer the qualification will need to gain ETA's approval to do so. Current ETA centres can do this via Quartz Web. For non ETA Centres to gain approval to run the qualification please provide your details via <http://quartz.etawards/quartz-system.com> and the ETA team will start the process of approval.

Resource Requirements

Assessors

Assessment must be carried out by competent assessors who hold, or are working towards, a current assessor qualification. They will be expected to regularly review their skills, knowledge and understanding and, where applicable, undertake continuing professional development to ensure that they are carrying out workplace assessment to the most up to date national occupational standards. Assessors must be able to demonstrate that they have relevant and sufficient technical competence to evaluate and judge performance and knowledge evidence of this qualification, the units being taken and the associated assessment criteria. This will be demonstrated either by holding a relevant technical qualification or by proven experience in the learner's industry. The assessor's competence must, at the very least, be at the same level as that required of the learner in the assessment so that they are able to demonstrate the skills needed.

Internal Quality Assurance Advisors

Internal quality assurance (IQA) must be carried out by competent quality assurers who should hold or be working towards, a current internal quality assurance qualification. They will be expected to regularly review their skills, knowledge and understanding and, where applicable, undertake continuing professional development to ensure that they are carrying out workplace assessment to the most up to date national occupational standards. Persons carrying out the role of internal quality assurance will also be expected to be fully conversant with the ETA requirements for IQA in centres. These are detailed in the centre manual. IQAAs must be able to demonstrate that they have relevant and sufficient technical competence to understand performance and knowledge evidence of this qualification, the units being taken and the associated assessment criteria. This will be demonstrated either by holding a relevant technical qualification or by proven experience in the learner's industry. The IQAA's competence must be sufficient to recognise what constitutes acceptable performance, knowledge and understanding as required by this qualification.

External Quality Assurance Advisors

ETA will appoint an appropriately qualified person to provide advice and guidance to the centre team and act as their external quality assurance advisor (EQAA). External quality assurance (EQA) must be carried out by competent quality assurers who should hold, or be working towards, a current external quality assurance qualification. They will be expected to regularly review their skills, knowledge and understanding and where applicable undertake continuing professional development to ensure that they are carrying out workplace assessment to the most up to

date national occupational standards. EQAAs must be able to demonstrate that they have relevant and sufficient technical competence to recognise performance and knowledge evidence of this qualification as required by the units being taken and the associated assessment criteria.

Assessment environment

The evidence of a learner's competence, knowledge and understanding for this qualification can only be regarded as valid, reliable, sufficient and authentic if demonstrated in a real working environment.

Qualification Number		601/1793/X
Title		NVQ Certificate in Performing Engineering Operations
Unit Level		Level 1
Guided Learning Hours		160
Total Qualification Time		200
Unit Credit Value		22
Unit Grading Structure		Pass

Learners must achieve a minimum of 22 credits to gain the qualification. 11 credits must be achieved by completing the 3 mandatory units and the remaining credits achieved by completing 2 units for the optional pathway with a minimum of 11 credits. Mandatory Units – all units must be completed

eta

Mandatory Unit requirements

Unit L/600/5781 - Working safely in an engineering environment
 Level 2 Guided Learning Hours 33 Unit Credit
 Value 5

Learning Outcome - The learner will:	Assessment Criterion - The learner can:	
1 Working safely in an engineering environment	1.1	Comply with their duties and obligations as defined in the Health and Safety at Work Act (HASAWA)
	1.2	Demonstrate their understanding of their duties and obligations to health and safety by carrying out all of the following: <ul style="list-style-type: none"> • applying in principle their duties and responsibilities as an individual under the Health and Safety at Work Act and other relevant current legislation • identifying, within their working environment, appropriate sources of information and guidance on health and safety issues, to include: <ul style="list-style-type: none"> - eye protection and personal protective equipment - COSHH regulations - risk assessments • identifying the warning signs and labels of the main groups of hazardous or dangerous substances • complying at all times with the appropriate statutory regulations and specific regulations relevant to their work
	1.3	Apply safe working practices and procedures at all times
	1.4	Apply safe working practices in an engineering environment, to include all of the following: <ul style="list-style-type: none"> • present themselves in the workplace suitably dressed/prepared for the activities to be undertaken • observe personal protection and hygiene procedures at all times • act in a responsible manner at all times within the working environment • maintain a tidy workplace, with exits and gangways free from obstructions • use tools and equipment safely and only for the purpose intended • carry out their work activities in accordance with legal requirements and the organisations safety policies • take measures to protect others from harm resulting from any work that they are carrying out
	1.5	Follow organisational accident and emergency procedures
	1.6	Comply with all emergency requirements, to include: <ul style="list-style-type: none"> • identifying the appropriate qualified first aiders or appointed person,

		<p>and the location of first aid facilities</p> <ul style="list-style-type: none"> • identifying the procedures to be followed in the event of injury to themselves or others • following organisational procedures in the event of fire/fire drills and for the evacuation of premises/work area • identifying and using the procedures to be followed in the event of dangerous occurrences or hazardous malfunctions of equipment, processes or machinery
	1.7	Recognise and control hazards in the workplace to minimise risks
	1.8	<p>Identify the hazards and risks that are associated with all of the following:</p> <ul style="list-style-type: none"> • their working environment (such as working at height, in confined spaces, hot work) • the tools and equipment that they use (such as machines, power tools, cutting tools) • materials and substances that they use (such as cutting fluids/oils, hydraulic fluids, fluxes) • using working practices that do not follow laid-down procedures
	1.9	Use correct manual lifting and carrying techniques
	1.10	<p>Demonstrate the following methods of manual lifting and carrying techniques:</p> <ul style="list-style-type: none"> • lifting alone <p>Plus one more of the following:</p> <ul style="list-style-type: none"> • with assistance of others • with mechanical assistance
2 Know how to work safely in an engineering environment	2.1	Describe the roles and responsibilities of themselves and others under the Health and Safety at Work Act and other current legislation (such as The Management of Health and Safety at Work Regulations; Workplace Health and Safety and Welfare Regulations; Personal Protective Equipment at Work Regulations; Manual Handling Operations Regulations; Provision and Use of Work Equipment Regulations; Display Screen at Work Regulations, Reporting of Injuries, Diseases and Dangerous Occurrences Regulations)
	2.2	Describe the specific regulations and safe working practices and procedures that apply to their work activities (such as The Electricity at Work Regulations, Woodworking Regulations)
	2.3	Describe the warning signs for the main groups of hazardous substances defined by Classification, Packaging and Labelling of Dangerous Substances Regulations

2.4	Explain how to locate relevant health and safety information for their tasks, and the sources of expert assistance when help is needed
2.5	Explain what constitutes a hazard in the workplace (such as moving parts of machinery, electricity, slippery and uneven surfaces, dust and fumes, handling and transporting, contaminants and irritants, material ejection, fire, working at height, environment, pressure/stored energy systems, volatile or toxic materials, unshielded processes)
2.6	Describe their responsibilities for dealing with hazards and reducing risks in the workplace (such as hazard spotting and safety inspections; the use of hazard check lists, carrying out risk assessments, COSHH assessments and safe systems of working)
2.7	Describe the risks associated with their working environment (such as the tools, materials and equipment that they use, spillages of oil and chemicals, not reporting accidental breakages of tools or equipment and not following laid-down working practices and procedures)
2.8	Describe the sources of information for safety (such as local work procedures, codes of practice or guidance, the severity of the accident or injury that the hazard may cause)
2.9	Describe the control measures that can be used to eliminate/reduce the hazard (such as lock-off and permit to work procedures, provision of safe access and egress, use of guards and fume extraction equipment, use of personal protective equipment)
2.10	Describe the first aid facilities that exist within their work area and within the organisation in general, and the procedures to be followed in the case of accidents involving injury
2.11	Explain what constitute dangerous occurrences and hazardous malfunctions, and why these must be reported even if no-one was injured
2.12	Describe the procedures for sounding the emergency alarms, evacuation procedures and escape routes to be used, and the need to report their presence at the appropriate assembly point

2.13	Describe the organisational policy with regard to fire fighting procedures; the common causes of fire and what they can do to help prevent them
2.14	Describe the personal protective equipment (PPE) and protective clothing that is available for their areas of activity
2.15	Describe the need to observe personal protection and hygiene procedures at all times (such as skin care (barrier creams, gloves); eye protection (safety glasses, goggles, full face masks); hearing protection (ear plugs, ear defenders); respiratory protection (fume extraction, face masks, breathing apparatus; head protection (caps with hair restraints, protective helmets); foot protection (safety footwear); dangers of ingestion and the importance of washing hands)
2.16	Explain how to act responsibly within the working environment (such as observing restricted area notices, complying with warning signs, walking not running, using equipment only for its intended purpose, not interfering with equipment or process that are not within their job role, following approved safety procedures at all times)
2.17	Describe the methods of manually handling and moving loads (such as pushing, pulling, levering); how to lift and carry loads safely and correctly (such as from ground level, waist high, overhead, reaching over); and the manual and mechanical lifting and moving aids available
2.18	Describe good housekeeping arrangements (such as maintaining cleanliness of their work area; removal of waste materials; storage of materials, tools and equipment and products; maintenance of access and egress (such as clear walkways, emergency exits))
2.19	Explain when to act on their own initiative and when to seek help and advice from others

Learning Outcome - The learner will:	Assessment Criterion - The learner can:	
<p>1 Work efficiently and effectively in engineering</p>	1.1	Work safely at all times, complying with health and safety legislation, regulations and other relevant guidelines
	1.2	Ensure that they apply all of the following checks and practices at all times during the engineering activities: <ul style="list-style-type: none"> • adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment (PPE) and other relevant safety regulations • wear the appropriate personal protective equipment for the work area and specific activity being carried out • use all tools and equipment safely and correctly, and only for their intended purpose • ensure that the work area is maintained and left in a safe and tidy condition
	1.3	Prepare the work area to carry out the engineering activity
	1.4	Prepare to carry out the engineering activity, by carrying out all of the following: <ul style="list-style-type: none"> • checking that the work area is free from hazards, and is suitably prepared for the activities to be undertaken • ensuring that any required safety procedures are implemented • obtaining any necessary personal protection equipment, and checking that it is in a usable condition • obtaining all tools and equipment required, and checking that they are in a safe and usable condition • obtaining all necessary drawings, specifications and associated documentation • obtaining the correct materials or components • ensuring that job instructions are understood • obtaining the appropriate authorisation to carry out the work
	1.5	Obtain all necessary tools and equipment, and check that they are in a safe and usable condition
	1.6	Report any difficulties or problems that may arise, and carry out any agreed actions
	1.7	Complete the work activities, to include all of the following: <ul style="list-style-type: none"> • returning tools and equipment to the designated location • returning drawings and work instructions • disposing of waste materials in line with organisational and environmental requirements • completing all necessary documentation accurately and legibly • identifying and reporting, where appropriate, any damaged or unusable tools or equipment

1.8	<p>Deal with problems affecting the engineering activity, to include two of the following:</p> <ul style="list-style-type: none"> • materials • tools and equipment • drawings • job specification • quality • people • timescales • safety • work activities or procedures
1.9	<p>Maintain effective working relationships with colleagues and supervisors</p>
1.10	<p>Deal with problems affecting the engineering activity, to include two of the following:</p> <ul style="list-style-type: none"> • materials • tools and equipment • drawings • job specification • quality • people • timescales • safety • work activities or procedures
1.11	<p>Maintain effective working relationships with supervisors</p>
	<p>Contribute to developing their own engineering competence, to include all of the following:</p> <ul style="list-style-type: none"> • describing the levels of skill, knowledge and understanding needed for competence in the areas of work expected of you • describing your development objectives/program, and how these were identified • using feedback and advice to improve their personal performance
1.13	<p>Tidy up the work area on completion of the engineering activity</p>

2 Know how to work efficiently and effectively in engineering	2.1	State the safe working practices and procedures to be followed whilst preparing and tidying up their work area
	2.2	Describe how to present themselves in the workplace, suitably dressed for the activities to be undertaken (such as being neat, clean and dressed in clothes which are appropriate to the area of activity; ensuring that, if you have long hair, it is tied back or netted; and removing any jewellery or other items that can become entangled in the machinery)
	2.3	State the personal protective equipment (PPE) to be worn for the engineering activities undertaken (such as correctly fitting overalls, safety shoes, eye protection, ear protection)
	2.4	State the correct use of any equipment used to protect the health and safety of themselves and their colleagues
	2.5	State the procedure for ensuring that all tools, equipment, materials and documentation relating to the work being carried out is available, prior to starting the activity
	2.6	State the checks to be carried out to ensure that tools and equipment are safe to use, and in full working order, prior to undertaking the activity
	2.7	State the action that should be taken if tools, equipment, materials or documentation are incomplete or do not meet the requirements of the activity
	2.8	Describe their role in helping to develop their own skills and knowledge (such as checking with their supervisor about the work they are expected to carry out and the standard they need to achieve; the safety points to be aware of and the skills and knowledge they will need to develop)
	2.9	State the benefits of continuous personal development and the training opportunities that are available in the workplace
	2.10	State the importance of reviewing their training and development with trainers and supervisors, to think about and compare the skills, knowledge and understanding that they have at any given point with the competence they need to develop, and to set objectives to overcome any shortfall or development needs

2.11	State the importance of maintaining effective working relationships within the workplace (such as listening attentively to instructions told to them by their supervisor, making sure that they ask for help and advice in a polite and courteous manner, responding positively to requests for help from others)
2.12	State the reasons for informing others of their activities which may have impact on their work (such as the need to temporarily disconnect a shared resource like electricity or compressed air supply; making undue noise or creating sparks, fumes or arc flashes from welding)
2.13	Describe how to deal with disagreements with others in ways which will help to resolve difficulties and maintain long term relationships
2.14	State the organisational procedures to deal with and report any problems that can affect working relationships
2.15	State the difficulties that can occur in working relationships, and how to resolve them
2.16	State the sorts of attitudes and requests that are likely to create conflict or negative responses
2.17	State the regulations that affect how they should be treated at work (such as Equal Opportunities and Equal Pay, Race Relations and Sex Discrimination, Working Time Directive, Disabled Persons Acts)
2.18	State the need to dispose of waste materials, and consumables (such as oils and chemicals) in a safe and environmentally friendly way
2.19	Describe where tools and equipment should be stored and located, and the importance of returning all tools and documentation to their designated area on completion of work activities
2.20	Describe when they should act on their own initiative and when to seek help and advice from others
2.21	State the importance of leaving the work area and equipment in a safe condition on completion of activities (such as equipment correctly isolated, cleaning the work area, and removing and disposing of waste)

Unit J/504/6352 – Using and communicating technical information
 Level 1

Guided Learning Hours 22

Unit Credit Value 3

Learning Outcome - The learner will:	Assessment Criterion - The learner can:	
<p>1 Use and communicate technical information</p>	1.1	Use the approved sources to obtain the required data, documentation or specifications
	1.2	In using these sources to obtain the necessary data and related specifications, carry out all of the following: <ul style="list-style-type: none"> • exercise care and control over the documents at all times • correctly extract all necessary data in order to carry out the required tasks • seek out additional information where there are gaps or deficiencies in the information obtained • deal with or report any problems found with the data • return all documentation to the approved location on completion of the work • complete all necessary production documentation
	1.3	Extract and interpret information from engineering drawings and other related documentation
	1.4	Use information extracted from engineering documentation, to include one or more of the following: <ul style="list-style-type: none"> • detailed component drawings • general assembly drawings • repair drawings • fluid power drawings • wiring/circuit diagrams • installation drawings • approved sketches • illustrations • visual display screens • modification drawings • sub-assembly drawings • schematic diagrams • fabrication drawings • pattern drawings • welding drawings • casting drawings • operational diagrams • physical layouts • manufacturers' manuals/drawings • photographic representations • contractual specifications
	1.5	Use information extracted from related documentation, to include one from the following: <ul style="list-style-type: none"> • job instructions • drawing instructions • test schedules • manufacturers' instructions • welding procedure specifications • material specifications • finishing specifications • reference tables/charts

	<ul style="list-style-type: none"> • national, international and organisational standards • planning documentation • quality control documents • operation sheets • process specifications
1.6	<p>Extract information that includes three of the following:</p> <ul style="list-style-type: none"> • materials or components required • dimensions • tolerances • build quality • installation requirements • connections to be made • circuit characteristics (such as pressure, flow, current, voltage speed) • surface texture requirements • location/orientation of parts • process or treatments required • assembly sequence • inspection requirements • part numbers for replacement parts • surface finish required • weld type and size • operations required • shape or profiles • test points to be used
1.7	Report any inaccuracies or discrepancies in the drawings and specifications
1.8	Use the information obtained to establish work requirements
1.9	Record and communicate the technical information, using appropriate means
1.10	<p>Include two of the following when recording and communicating the technical information:</p> <ul style="list-style-type: none"> • producing fully detailed sketches of work/circuits completed or required • recording data from testing activities • producing reports on activities that you have completed • completing material and tool requisition documentation • producing a list of replacement parts required for a maintenance activity • completing training records or portfolio references • completing quality documentation
1.11	Report any difficulties or problems that may arise with using or communicating the information, and carry out any agreed actions

2 Know how to use and communicate technical information	2.1	Describe the information sources used for the data and documentation that they use in their work activities (such as verbal, written, electronic)
	2.2	State why technical information is presented in different forms (such as drawings, job instructions, data sheets and national and international standards)
	2.3	State how and where to obtain the various documents that they will be using (such as safety handouts, drawings, planning documentation, work instructions, maintenance records, technical manuals and reference tables/charts), and how to check that they are current and valid
	2.4	Describe the types of engineering drawings used and how they interrelate (such as isometric and orthographic drawings; assembly, sub-assembly and general arrangement drawings; circuit and wiring diagrams, block and schematic diagrams; fluid power and instrumentation and control diagrams)
	2.5	Describe the meaning of the different symbols and abbreviations found on the documents that they use (such as surface finish to be achieved, linear and geometric tolerances, electronic components, weld symbols and profiles, pressure and flow characteristics, torque values, imperial and metric systems of measurement, tolerancing and fixed reference points)
	2.6	State how to use other sources of information to support the data (such as electronic component pin configuration specifications, standard reference charts for limits and fits, tapping drill reference charts, bend allowances required for material thickness, electrical conditions required for specific welding electrodes, mixing ratios for bonding and finishing materials, metal finishing specifications and inspection requirements)
	2.7	Describe the procedures for reporting any discrepancies in the data or documents, and for reporting lost or damaged drawings and documents
	2.8	State care and control procedures for the documents, how damage or graffiti on drawings can lead to scrapped work and the importance of returning them to the designated location on completion of the work activities
	2.9	State typical ways of communicating technical information (such as sketches, test and inspection reports, work planning documents), and the amount of detail that should be included

	2.10	Describe the need to ensure that sketches are of a suitable size, use appropriate drawing conventions, are in proportion and are legible to others
	2.11	State when to act on their own initiative to find, clarify and evaluate information, and when to seek help and advice from others
	2.12	State why they should always seek clarification if they are in any doubt as to the validity or suitability of the information that they have gathered
	2.13	State to whom they should report in the event of problems that they cannot resolve

