SEG Awards ABC Level 2 Award and ABC Level 2 Certificate in Fabrication and Welding Practice

Qualification Guidance

Level 2 Award – 603/2242/1
Level 2 Certificate – 603/2243/3

About Us

At the Skills and Education SEG Awards (ABC)[1] we continually invest in high quality qualifications, assessments and services for our chosen sectors. As a UK leading sector specialist we continue to support employers and skills providers to enable individuals to achieve the skills and knowledge needed to raise professional standards across our sectors.

ABC has an on-line registration system to help customers register learners on its qualifications, units and exams. In addition it provides features to view exam results, invoices, mark sheets and other information about learners already registered.

The system is accessed via a web browser by connecting to our secure website using a username and password:
https://secure.ABCawards.co.uk/ors/secure_login.asp

Sources of Additional Information

The ABC website www.ABCawards.co.uk provides access to a wide variety of information.

Copyright

Specification Code, Date and Issue Number

The ABC Awards specification code is A5702-02 (Award) and C5702-02 (Certificate). The date of this specification is 01 September 2017. The Issue number is 2.

[1] ABC Awards is a brand of the Skills and Education Group Awards, a recognised awarding organisation and part of the Skills and Education Group. Any reference to ABC Awards, its registered address, company or charity number should be deemed to mean the Skills and Education Group Awards.

Contents

This is a live document and as such will be updated when required. It is the responsibility of the approved centre to ensure the most up-to-date version of the Qualification Guide is in use. Any amendments will be published on our website and centres are encouraged to check this site regularly.

Introduction

The new suite of ABC Awards qualifications in Fabrication and Welding Practice have been updated to include the latest fabrication and welding techniques, materials, processes and practices, and are assessed in line with industry demands, which include updated rigorous practical assessments as well as online on-demand multiple-choice question (MCQ) assessments.

They have been developed in conjunction with academia and industry experts and will also complement the newly launched Apprenticeship Trailblazer Standards.[2]

The ABC Level 2 Award and Certificate in Fabrication and Welding Practice are suitable for a wide range of learners, for example the self-employed, adults wishing to specialise by pursuing single units and young people who are new entrants to the industry. They link to ABC Level 1 Certificate and the ABC Level 3 Certificate and Diploma in Fabrication and Welding Practice.

The overall aims of the qualifications across the 3 Levels are to:

- raise a learner's skill level and enhance their underpinning knowledge
- to promote progression from basic welding and fabrication skills to a more highly developed understanding of equipment functions and how materials behave when subjected to the welding process
- educate the learner in the observation of the correct and safe procedures that are paramount in the fabrication and welding industry.

Aims

The ABC Level 2 Award and Certificate in Fabrication and Welding Practice aim to:

- provide potential entrants (school leavers) to the industry with an opportunity to acquire appropriate practical skills and knowledge required for access to employment

[2] Please see the Government apprenticeship standards website for further information gov.uk/government/collections/apprenticeship-standards

- provide an opportunity for existing employees to obtain relevant and up to date practical skills and knowledge
- provide an opportunity for retraining of adults who wish to access employment within the engineering sector
- provide an opportunity for progression onto further/higher levels of study.

Target Group

These qualifications are designed for a wide range of learners such as:

- the self-employed
- adults wishing to specialise by pursuing single units
- young people who are new entrants to the industry
- young people who are following an apprenticeship programme.

ABC expects approved centres to recruit with integrity on the basis of a learner's ability to contribute to and successfully complete all the requirements of a unit/s or the full qualification.

Content Overview

The ABC Level 2 Award is a 2 unit qualification from a choice of 6 that include MMA, MAG and TIG Welding, Plate and Sheet Metal Fabrication and Engineering Drawing. It is designed to give learners a short, sharp and focused hands-on experience of a welding and/or fabrication process.

The ABC Level 2 Certificate qualification includes a choice of 4 out of 6 units as above, plus a mandatory externally assessed MCQ unit 'Materials, Science and Calculations for Fabrication and Welding Practice'.

Progression Opportunities

Learners who successfully complete the ABC Level 2 Award in Fabrication and Welding Practice can complete additional units to gain the ABC Level 2 Certificate in Fabrication and Welding Practice.

Learners can then progress onto the ABC Level 3 Certificate or Diploma in Fabrication and Welding Practice.

Centres should be aware that Reasonable Adjustments which may be permitted for assessment may in some instances limit a learner's progression into the sector. Centres must, therefore, inform learners of any limits their learning difficulty may impose on future progression.

Resource Requirements

Centres must provide access to sufficient equipment in the centre or workplace to ensure candidates have the opportunity to cover all of the practical activities.

For external assessments the examination should be conducted at the Centre where the course delivery has taken place and should be carried out in accordance with the examination requirements of ABC Awards.

Tutor/Assessor Requirements

We require those involved in the assessment process to be suitably experienced and / or qualified. In general terms, this usually means that the assessor is knowledgeable of the subject / occupational area to a level above that which they are assessing.

Assessors should also be trained and qualified to assess or be working towards appropriate qualifications.

Language

These specifications and associated assessment materials are in English only.

Qualification Summary

Qualification and Pathways ABC Level 2 Award in Fabrication and Welding Practice ABC Level 2 Certificate in Fabrication and Welding Practice	
Qualification Number	Level 2 Award – 603/2242/1 Level 2 Certificate – 603/2243/3
Regulated	The qualification, identified above, is regulated by Ofqual.
Assessment	Level 2 Award and Certificate – Units 2 to 7 are internally assessed, with internal and external moderation. Level 2 Certificate – Unit 1 is assessed via an externally set 30 question multiple choice question (MCQ) examination. The pass mark will be set at 60% (18 out of 30) and results will be Pass/Fail only.
Grading	Pass (although the unit practical tasks are graded, the overall grade for the qualification is a pass).
Operational Start Date	01/09/2017
Ofqual Review Date	01/09/2020
ABC Sector	Engineering
Ofqual SSA Sector	4.1 Engineering
Contact	See the ABC Awards website for Centre Support Officer responsible for these qualifications.

ABC Level 2 Award in Fabrication and Welding Practice

Rules of Combination:

Learners wishing to follow a **Welding Pathway** must pass a minimum of 2 units from Group B.

Learners wishing to follow a **Fabrication and Welding Pathway** must pass a minimum of 1 unit from Group B and minimum of 1 unit from Group C.

For this qualification, the Group A unit is not applicable and the Group D unit is optional.

Units	Unit Number	Level	Credit Value	GLH
Group A				
1. NA	NA	NA	NA	NA
Group B				
2. Manual Metal-Arc Welding – Low Carbon Steel or Stainless Steel	J/616/1267	2	6	50
3. Metal Active Gas Welding – Low Carbon Steel, Stainless Steel or Aluminium	L/616/1268	2	6	50
4. Tungsten Inert Gas Shielded Welding – Low Carbon Steel, Stainless Steel or Aluminium	R/616/1269	2	6	50
Group C				
5. Fabrication Processes – Plate	J/616/1270	2	6	50
6. Fabrication Processes – Sheet Metal	L/616/1271	2	6	50
Group D				
7. Engineering Drawing Using Manual and CAD Techniques	R/616/1272	2	6	50

ABC Level 2 Certificate in Fabrication and Welding Practice

Rules of Combination:

Learners wishing to follow a **Welding Pathway** must pass a minimum of 4 units.
1 unit must be from Group A and 3 units must be from Group B.

Learners wishing to follow a **Fabrication and Welding Pathway** must pass a minimum of 4 units.
1 unit must be from Group A.
1 unit must be from Group B and 1 unit must be from Group C.
A 4th unit can come from Group B, C or D.

Units	Unit Number	Level	Credit Value	GLH
Group A				
1. Materials, Science and Calculations for Fabrication and Welding Practice	F/616/1266	2	8	80
Group B				
2. Manual Metal-Arc Welding – Low Carbon Steel or Stainless Steel	J/616/1267	2	6	50
3. Metal Active Gas Welding – Low Carbon Steel, Stainless Steel or Aluminium	L/616/1268	2	6	50
4. Tungsten Inert Gas Shielded Welding – Low Carbon Steel, Stainless Steel or Aluminium	R/616/1269	2	6	50
Group C				
5. Fabrication Processes – Plate	J/616/1270	2	6	50
6. Fabrication Processes – Sheet Metal	L/616/1271	2	6	50
Group D				
7. Engineering Drawing Using Manual and CAD Techniques	R/616/1272	2	6	50

If learners achieve credits from units of the same title (or linked titles) at more than one level, they cannot count credits achieved from both units towards the credit target of a qualification.

Qualification Purpose	B. Prepare for further learning or training and/or develop knowledge and/or skills in a subject area. B2. Develop knowledge and/or skills in a subject area.							
Entry Requirements	There are no formal pre-requisites for entry onto this scheme. Each centre is required to notify the awarding body of its policies on access and equality of opportunity. Within the parameters of these policies, a centre is expected to recruit with integrity on the basis of a learner's ability to contribute to and successfully complete the qualification.							
Age Range	Pre 16	✓	16 - 18	✓	18+	✓	19+	✓
Recommended GLH	Level 2 Award – 100 Level 2 Certificate – 230							
Recommended TQT	Level 2 Award – 120 Level 2 Certificate – 260							
Credit Value	Level 2 Award – 12 Level 2 Certificate – 26							
Learning Aims Reference	See Learning Aim Reference Service (LARS) website: https://data.gov.uk/dataset/learning-aim-reference-service							
Type of Funding Available	See Learning Aim Reference Service (LARS) website							
Qualification Fee / Unit Fee	See ABC website for current fees and charges.							
Additional Information	See ABC website for resources available for this qualification.							

Unit Details

1. Materials, Science and Calculations for Fabrication and Welding Practice

Unit Reference	F/616/1266
Level	2
Credit Value	8
Guided Learning Hours	80
Unit Summary	Learners will understand differences in various metals, the way in which they are identified and the properties each have which will allow them to be used for certain applications and how materials are supplied to industry in different forms, sizes and profiles. Introductions to the application and use of welding terms and symbols are covered relating to fillet and butt welded joints. Simple applications of science are covered to enable the learner to understand how materials behave during the application of heat. This unit also covers the basic application of mathematics related to welding and fabrication activities and at a level that the learner should be able to understand and use confidently. This unit is assessed by a 30 question externally set MCQ (multiple choice question) examination.

Learning Outcomes The learner will:	**Assessment Criteria The learner can:**
1. Know about ferrous and non-ferrous materials	1.1. Identify the difference between ferrous and non-ferrous materials 1.2. Identify the use of ferrous materials, to include: • low, medium and high carbon steels • grey cast iron

	• stainless steel 1.3. Define the constituent elements in the ferrous materials listed in 1.2. 1.4. Identify the use of non-ferrous materials, to include: • aluminium • copper 1.5. Define the melting point of the non-ferrous materials listed in 1.4
2. Know about physical and mechanical properties of materials	2.1. Define the physical properties of the materials listed in 1.2 and 1.4, to include: • colour • weight • thermal conductivity • electrical conductivity • corrosion resistance • ability to be magnetised 2.2. Define the mechanical properties of the materials listed in 1.2 and 1.4, to include: • strength (tensile, compressive and shear) • malleability • elasticity • ductility • plasticity • hardness • brittleness • toughness
3. Know about forms of supply	3.1. Define forms of supply in terms of size and shape, to include: • sheet • plate • pipe/tube • wires and rods • equal angle section • channel sections • square and rectangular hollow section • extrusions • forgings
4. Know about the effects of heat	4.1. Define heat transfer, to include: • conduction • convection • radiation

	4.2. Explain the effects of heat relating to welding activities: • thermal conductivity in materials • expansion/distortion • rapid cooling • effects on mechanical properties of low carbon steel
5. Know about gases used in welding	5.1. Identify gases found in each of the groups listed: • inert • flammable • reactive 5.2. State the flame temperatures of common flammable gases when mixed with oxygen 5.3. State the advantages of gas mixtures when using gas shielded welding processes
6. Be able to carry out calculations relating to welding and fabrication activities	6.1. Perform calculations, to include: • area • length • volume • cost 6.2. Use calculations that include: • decimals • percentages • averages • ratios 6.3. Perform simple calculations relating to welding costs
7. Know about welding symbols	7.1. Identify welding symbols that meet current standards when used on butt and fillet welded joints, to include: • symbolic representation • weld size (leg length) • position of welding • site weld • weld all round

Supporting Unit Information

Materials, Science and Calculations for Fabrication and Welding Practice – F/616/1266 – Level 2

Indicative Content

Note: Indicative content provides an indication of the scope for the Learning Outcomes and Assessment Criteria. It is intended as a resource to help guide the delivery and assessment of the unit. Indicative content is NOT a statement of material which must be covered and evidenced for assessment.

Learning Outcome 1. Know about ferrous and non-ferrous materials

1.1 Identify the difference between ferrous and non-ferrous materials - basic differences between metals (ferrous/non-ferrous) and non-metals (natural/man made) in terms of physical properties.

1.2 Identify the use of ferrous materials – low, medium and high carbon steels, grey cast iron, stainless steels.

1.3 Define the constituent elements in the ferrous materials listed in 1.2 with regards percentage carbon and other elements within the composition.

1.4 Identify the use of non-ferrous materials – aluminium and copper (uses in the engineering industry with reference to fabrication and welding applications).

1.5 Define the melting point of aluminium and copper and compare with other materials.

Learning Outcome 2. Know about physical and mechanical properties of materials

2.1 Define in simple terms the physical properties of low, medium and high carbon steels, cast iron, stainless steel, aluminium and copper in terms of colour, weight, thermal conductivity, electrical conductivity, corrosion resistance, ability to be magnetised and relate these properties to typical examples found in a welding and/or fabrication workshop. State the effects of like and unlike poles of a magnet.

2.2 Define in simple terms the mechanical properties of low, medium and high carbon steels, cast iron, stainless steel, aluminium and copper in terms of strength, malleability, elasticity, plasticity,

hardness, brittleness, toughness and relate these properties to typical examples found in a welding and/or fabrication workshop.

Learning Outcome 3. Know about forms of supply

3.1 Define forms of supply in terms of size and shape of sheet, plate. Pipe, tube, wires, rods, equal angle sections, channel sections, square hollow section, rectangular hollow section, extrusions, forgings and relate these forms of supply to typical examples found in a welding and/or fabrication workshop.

Learning Outcome 4. Know about the effects of heat

4.1 Define heat transfer - Heat is a form of energy and that all energy (whether it be electrical, mechanical, chemical etc.) is measured in Joules if complying with the SI system. Relate methods of transfer of heat energy – conduction, convection, radiation.

4.2 Explain the effects of heat relating to welding activities – thermal conductivity in materials, expansion in terms of angular, transverse and longitudinal distortion. State the effects of rapid cooling of welds in terms of defects, cracking and weld failure in service and the effects on the mechanical properties of low carbon steel.

Learning Outcome 5. Know about gases used in welding

5.1 Identify gases found with regards to inert, flammable and reactive gases and state their uses in industry.

5.2 State the flame temperatures of common flammable gases when mixed with oxygen. Describe the combustion of fuel gases with oxygen and air in terms of - flame temperature - flame structure - applications in welding and cutting. N.B. Ensure the oxy-acetylene flame is given precedence. Oxidation and reduction - flame characteristic, fluxes (include arc welding and gas welding fluxes) and shielding gases. References to be made with regard to the use of acetylene, propane and hydrogen.

5.3 State the advantages of gas mixtures when using gas shielded welding processes – Argon, Argon / Carbon Dioxide mix, Argon / Oxygen mix, Argon / Hydrogen mix, Helium, Argon / Helium mix and their uses in fabrication and welding applications.

Learning Outcome 6. Be able to carry out calculations relating to welding and fabrication activities

6.1 Perform calculations of area, length, volume and cost of consumables/materials used in fabrication and welding applications.

State the basic quantities, units, derived units and symbols used in the calculations. Calculations to relate to welding problems.

6.2 Use calculations containing decimals, percentages, averages and proportions.

6.3 Perform simple calculations related to welding costs.

Learning Outcome 7. Know about welding symbols

7.1 Identify welding symbols that meet current standards when used on butt and fillet welded joints - welding symbols, arrow and reference line to identify weld joint preparations. Identify workshop drawings with weld symbols to obtain the following information - lengths of welds, sizes of welds, types of welding process, weld all round and site weld. Welding positions (PA=Flat, PC=Horizontal vertical, PF=Vertical Up, PG=Vertical Down, PE=Overhead). Welding terms – slope and tilt.

Teaching Strategies and Learning Activities

Centres should adopt a delivery approach which supports the development of their particular learners. The aims and aspirations of all learners, including those with identified specific needs, including learning difficulties/disabilities, should be considered and appropriate support mechanisms put in place.

This unit provides material, scientific and mathematical background whilst enhancing (both in breadth and depth) the knowledge base of any of the other units contributing to the ABC Level 2 qualifications. This needs to be delivered in the context of Fabrication and Welding practice.

Health and safety aspects of fabrication and welding practice should be reinforced within all practical units.

Learning should be delivered through a combination of learner-centred classroom sessions, workshop practice and individual guided learning. The emphasis is on practical learning opportunities and individual action plans. The prospective learning group is likely to require a good deal of tutor support in achieving the planned outcomes.

It is suggested that a simulated working atmosphere/environment should be adopted. In addition, learners should be provided with real work experiences wherever possible and visits to places of interest and co-

operation with local engineering establishments are strongly recommended.

Delivery may be enhanced by:

- liaising with employers with reference to delivery, work experience and/or resources
- visits to appropriate places of interest
- the provision of information and guidance to learners on the availability and type of employment the qualification may lead to and on the progression routes available for further education and training.

Methods of Assessment

This unit is mandatory for all learners undertaking the Level 2 Certificate in Fabrication and Welding Practice.

This unit is assessed by a 30 question externally set MCQ (multiple choice question) examination to be completed in one hour.

In order to achieve a pass grade, a minimum mark of 60% will be required (18 correct questions out of 30). The grade recorded will be pass/fail only.

The format of the questions will be standard multi-choice type, i.e. one question with four possible answers, only one of which is correct.

Evidence of Achievement

The examination covers this unit according to the following split:

- a minimum of 1 and maximum of 2 questions from each assessment criteria from this unit.

The examination should be conducted at the Centre where the course delivery has taken place and should be carried out in accordance with the examination requirements of ABC Awards.

It is required that an independent invigilator should oversee the examination and that course tutors/assessors should not have access to the examination room before, during or after the examination.

ABC Awards reserve the right to attend examinations to undertake an audit of the centre's procedures relating to compliance with these invigilation instructions.

Additional Information

Additional guidance for delivering and assessing ABC Awards qualifications and information about Internal Quality Assurance is available on the ABC Awards web site.

2. Manual Metal-Arc Welding – Low Carbon Steel or Stainless Steel

Unit Reference	J/616/1267
Level	2
Credit Value	6
Guided Learning Hours	50
Unit Summary	The unit covers the equipment and consumables required for manual metal-arc (MMA) welding and the techniques used to produce welds that meet the quality standard required. Practical weld samples covering butt and fillet welds must be welded in the flat (PA) or horizontal vertical (PB) welding positions. These are rigorously tested to show that the completed welds are structurally sound. Welding inspection techniques are also covered to give the learner the information and skills to carry out weld inspection. Health and safety is an integral part of this unit covering MMA welding activities. Learners need to be aware of the dangers of fires and the need to wear correct PPE.

Learning Outcomes The learner will:	**Assessment Criteria The learner can:**
1. Know about safe working practices when using MMA welding equipment	1.1. Identify the need to use appropriate PPE (personal protective equipment) when carrying out manual metal welding activities 1.2. Identify associated risks when welding with MMA, to include: • arc radiation burns • arc eye • burns from handling hot materials • welding fumes • electric shocks

	• fire • sparks 1.3. Identify fire prevention and emergency procedures required in the workplace, to include: • causes of fire • types of fire extinguisher used • evacuation procedures 1.4. Identify the main groups of safety signs, to include: • warning • prohibition • mandatory • information signs
2. Know about the equipment used for MMA welding	2.1. Identify the function of the listed equipment when used with MMA welding activities: • transformer/generators • transformer/rectifiers • welding lead • welding return lead • welding earth • electrode holders 2.2. Identify ancillary equipment used when welding with the MMA welding process
3. Know about welding consumables used in MMA welding	3.1. Identify suitable storage conditions for manual metal welding electrodes 3.2. Identify the electrode in terms of: • size by electrode diameter • flux coating type
4. Know about material preparation and the setting up of MMA welding equipment	4.1. Identify appropriate safety checks on MMA welding equipment prior to use 4.2. Prepare to carry out MMA welding to produce welded joints in the PA or PB positions, to include: • production of the correct welding preparation • identify distortion control methods to be used • select the correct electrode type/size • set the correct welding current • produce suitable tack welds • weld the joint

	• post weld cleaning 4.3. Identify welding parameters to be used when completing welded joints using MMA welding, to include: • welding current • electrode slope and tilt angles • arc length • electrode polarity
5. Be able to complete a weld on either low carbon steel or stainless steel using the MMA welding process	5.1. Identify suitable safety checks on welding equipment prior to use 5.2. Complete a weld on: • low carbon steel greater than 6 mm in thickness or • stainless steel in materials greater than 3mm in thickness using the MMA welding process, to include as a minimum: • lap joint • open outside corner • single vee butt joint • tee fillet weld Welds to be completed in the PA or PB position
6. Know how to carry out and report on the inspection of butt and fillet welded joints	6.1. Describe the limitations of visual inspection on completed welded joints using the MMA welding process 6.2. Identify and describe typical welding defects that may be found in MMA welded joints, to include: • undercut • cracks • slag inclusions • porosity • arc craters • lack of penetration 6.3. Check completed welds for: • weld size to include leg length and throat thickness • weld profile • weld appearance and uniformity • absence of surface defects

	6.4. Complete the requirements for a report document on welds produced
7. Know how to carry out destructive tests on completed MMA welded joints	7.1. Prepare and carry out a destructive test on a fillet weld in accordance with the supplied drawing of the welded joint, to include: • nick break test 7.2. Prepare and carry out destructive tests on a completed single vee butt weld in accordance with the supplied drawing of the welded joint, to include: • face bend test • root bend test • fracture test
8. Know about documentation relating to welding activities	8.1. Identify appropriate documentation relating to welding activities, to include: • welding procedure specifications (WPS) • weld inspection report

Supporting Unit Information

Manual Metal-Arc (MMA) Welding – Low Carbon Steel or Stainless Steel – J/616/1267 – Level 2

Indicative Content

Note: Indicative content provides an indication of the scope for the Learning Outcomes and Assessment Criteria. It is intended as a resource to help guide the delivery and assessment of the unit. Indicative content is NOT a statement of material which must be covered and evidenced for assessment.

An indication of typical areas of learning includes the following

Learning Outcome 1. Know about safe working practices when using MMA welding equipment

1.1 PPE used to include safety footwear, flame proof overalls, welding gauntlets, welding hand screen/head screen, use of the filter and plain glasses in welding screens and safety spectacles, responsibility of employers and employees.

1.2 Identify associated risks – fumes, burns, radiation, hot metal, confined spaces, waste materials, electric shock, stray arcs, and enrichment of the ambient atmosphere.

1.3 Fire prevention and emergency procedures – siting of fire extinguishers, emergency switches, workshop exits, location and purpose of fuses and electrical isolation switches, extraction, protective clothing and equipment.

1.4 Identify groups of safety signs - warning sign – a sign giving warning of a hazard or danger (e.g. 'danger: electricity'); prohibition sign – a sign prohibiting behaviour likely to increase or cause danger (e.g. 'no access for unauthorised persons'); mandatory sign – a sign prescribing specific behaviour (e.g. 'eye protection must be worn'); information sign – a sign giving information on emergency exits, first aid, or rescue facilities (e.g. 'emergency exit/escape route').

Learning Outcome 2. Know about the equipment used for MMA welding

2.1 Equipment – Identify, state the function of and safely connect components e.g. transformer/rectifier, transformer/generator, welding leads, returns and earth, electrode holders.

2.2 Ancillary equipment and tools – wire brush to clean the joint area adjacent to the weld (and the weld itself after slag removal); a chipping hammer to remove slag from the weld deposit; and, when removing slag, a pair of clear lens goggles or a face shield to protect the eyes (lenses should be shatter-proof and non-flammable).

Learning Outcome 3. Know about welding consumables used in MMA welding

3.1 Electrode storage conditions – warm, dry, free from moisture, off the floor, avoid damp areas, use of electrode ovens.

3.2 Electrode identification - covering and contents, electrode diameter to current standards.

Learning Outcome 4. Know about material reparation and the setting up of MMA welding equipment

4.1 Safety checks – welding screen condition, cable size and condition, abrasions, bare wires, connections, operation of the fume extraction system.

4.2 Prepare to carry out MMA welding – methods of distortion control – pre-setting, restraint, weld sequence, chills, joint preparation, pre/post heating.

4.3 Identify welding parameters to achieve butt and fillet welds - welding current and arc voltage, identify and set OCV, slope and tilt angles of welding electrode, speed of travel, arc length, and electrode polarity.

Learning Outcome 5. Be able to complete welds on low carbon steel or stainless steel using the MMA welding process

5.1 Complete weld on low carbon steel (in material 6mm in thickness) or stainless steel - edge preparations and joint set up for lap fillets, open outside corner fillet, tee fillet and single vee butt welds. Select the welding current, open circuit voltage and arc voltage. Identify and select to achieve butt and fillet welds on low carbon steel. Techniques of striking, maintaining and breaking the arc and electrode manipulation. Identify and select to achieve butt and fillet welds on low carbon steel.

Learning Outcome 6. Know how to carry out and report on the inspection of butt and fillet welded joints

6.1 Limitation of visual inspection – reference to a person's eye sight, only show surface defects. Conditions for viewing - good lighting conditions, view when cold, weld and parent plate area needs to be free from surface contaminates - paint, oxides, slag, spatter.

6.2 Identify and describe typical welding defects – causes (poor welding technique, arc length, speed of travel, electrode slope and tilt angles) and prevention of undercutting, cracks, slag inclusions, porosity, arc craters and lack of penetration.

6.3 Carry out visual inspection checks - use viewing aids which will enhance the inspection process: magnifying glass – to enhance the viewing of visual inspection of welded joints.
Fillet weld gauges – assess the size of completed welds (leg lengths, throat thickness).
Welding gauge – measure leg length, throat thickness, weld preparation angles, depth of undercut, weld profile measurements
Profile gauge – assess the shape and profile of completed butt and fillet welds.

6.4 Completion of report documentation - inspection report to provide a record and must include: date of test, name of welder, name of inspector, welding standard required, identification of weld joint/s, method of welding, joint type, type of inspection used, drawing/sketch of weld showing defects located, position and type, action to be taken and additional comments.

Learning Outcome 7. Know how to carry destructive tests on completed MMA welded joints

7.1 Prepare and carry out a destructive test on a fillet weld – macro-etch test, nick break test (health and safety procedures to be followed at all times).

7.2 Prepare and carry out a destructive test on a single vee butt weld – macro-etch test, nick break test, root and face bend tests (health and safety procedures to be followed at all times).

Learning Outcome 8. Know about documentation relating to welding activities

8.1 Identify appropriate documentation - use of a WPS (welding procedure sheet) to give information to the welder on the criteria required to produce a weld that will meet the required quality standard. Contents of WPS (welding procedure sheets) should

include: joint type, method of preparation, joint set up, welding process, consumables, welding parameters used, welding position, and details of special applications (pre/post heating).
Carry out checks as required and complete a weld inspection report.

Teaching Strategies and Learning Activities

Centres should adopt a delivery approach which supports the development of their particular learners. The aims and aspirations of all learners, including those with identified specific needs, including learning difficulties/disabilities, should be considered and appropriate support mechanisms put in place.

Health and safety aspects of fabrication and welding practice should be reinforced within all practical units.

Learning should be delivered through a combination of learner-centred classroom sessions, workshop practice and individual guided learning. The emphasis is on practical learning opportunities and individual action plans. The prospective learning group is likely to require a good deal of tutor support in achieving the planned outcomes.

It is suggested that a simulated working atmosphere/environment should be adopted. In addition, learners should be provided with real work experiences wherever possible and visits to places of interest and co-operation with local engineering establishments are strongly recommended.

Delivery may be enhanced by:

- liaising with employers with reference to delivery, work experience and/or resources
- visits to appropriate places of interest
- the provision of information and guidance to learners on the availability and type of employment the qualification may lead to and on the progression routes available for further education and training.

Methods of Assessment

This unit will be internally assessed, internally and externally moderated.

Evidence of Achievement

ABC Awards has produced an assessment pack for this unit which is available to approved centres from the ABC Awards website.

This assessment pack contains details of the requirements of the practical tasks and examination in the ABC Level 2 Award and Certificate in Fabrication and Welding Practice. Prior to commencing the qualification(s), the learner, assessor and appointed Internal Quality Assurer should familiarise themselves with the contents of this pack and what is to be expected in order to achieve.

Additional Information

Additional guidance for delivering and assessing ABC Awards qualifications and information about Internal Quality Assurance is available on the ABC Awards web site.

3. Metal Active Gas Welding – Low Carbon Steel, Stainless Steel or Aluminium

Unit Reference	L/616/1268
Level	2
Credit Value	6
Guided Learning Hours	50
Unit Summary	The unit covers the equipment and consumables required for metal active gas (MAG) welding and the techniques used to produce welds that meet the quality standard required. Practical weld samples covering butt and fillet welds must be welded in the flat (PA) or horizontal vertical (PB) welding positions. These are rigorously tested to show that the completed welds are structurally sound. Welding inspection techniques are also covered to give the learner the information and skills to carry out weld inspections. Health and safety is an integral part of this unit covering MAG welding activities. Learners need to be aware of the dangers of fires and the need to wear correct PPE.

Learning Outcomes The learner will:	**Assessment Criteria The learner can:**
1. Know about safe working practices when using MAG welding equipment	1.1. Identify the need to use appropriate PPE (personal protective equipment) when carrying out MAG welding activities 1.2. Identify the risks associated when welding with MAG, to include: • arc radiation burns • arc eye • burns from handling hot materials • welding fumes • electric shocks

	• fire • sparks 1.3. Identify fire prevention and emergency procedures required in the workplace, to include: • causes of fire • types of fire extinguisher used • evacuation procedures 1.4. Identify the main groups of safety signs, to include: • warning • prohibition • mandatory • information signs
2. Know about the equipment used for MAG welding	2.1. Identify the function of the listed equipment when used with MAG welding activities: • power source unit • welding lead • welding return lead • welding earth • welding torch • wire feed unit • shielding gas supply, regulator and flow meter 2.2. Identify ancillary equipment used when welding with the MAG welding process
3. Know about welding consumables used in MAG welding	3.1. Identify suitable storage conditions for MAG welding wires 3.2. Identify the electrode wires in terms of: • size by electrode diameter • weight of spool • copper coated type
4. Know about material preparation and the setting up of MAG welding equipment	4.1. Identify appropriate safety checks on MAG welding equipment prior to use 4.2. Prepare to carry out the MAG welding process to produce welded joints in the PA or PB positions, to include: • production of the correct welding preparation • identify distortion control methods to be used • select the correct wire size

	• select correct gas flow rates • set the correct welding current • produce suitable tack welds • weld the joint • post welding cleaning 4.3. Identify welding parameters to be used when completing welded joints using MAG welding, to include: • welding current • gas type and flow rates • welding torch slope and tilt angle
5. Be able to complete a weld on either low carbon steel plate, stainless steel or aluminium using the MAG welding process	5.1. Identify suitable safety checks on welding equipment prior to use 5.2. Complete a weld on: • low carbon steel greater than 6 mm in thickness or • stainless steel in materials greater than 3mm in thickness or • aluminium in materials greater than 3mm in thickness using the MAG welding process, to include as a minimum: • lap joint • open outside corner • single vee butt joint • tee fillet weld Welds to be completed in the PA or PB position
6. Know how to carry out and report on the visual inspection of butt and fillet welded joints	6.1. Describe the limitations of visual inspections on completed welded joints when using the MAG welding process 6.2. Identify and describe typical welding defects that may be found in MAG welded joints, to include: • undercut • cracks • inclusions • porosity • arc craters • lack of fusion • lack of penetration 6.3. Check completed welds for:

	• weld size to cover leg length and throat thickness. • weld profile • weld appearance and uniformity • absence of surface defects 6.4. Complete the requirements for a report document on welds produced
7. Know how to carry out destructive tests on completed MAG welded joints	7.1. Prepare and carry out a destructive test on a fillet weld in accordance with the supplied drawing of the welded joint, to include: • nick break test 7.2. Prepare and carry out destructive tests on a completed single vee butt weld in accordance with the supplied drawing of the welded joints, to include: • face bend test • root bend test • fracture test
8. Know about documentation relating to welding activities	8.1. Identify appropriate documentation relating to welding activities, to include: • welding procedure specifications (WPS) • weld inspection report

Supporting Unit Information

Metal Active Gas (MAG) Welding – Low Carbon Steel, Stainless Steel or Aluminium – L/616/1268 – Level 2

Indicative Content

Note: Indicative content provides an indication of the scope for the Learning Outcomes and Assessment Criteria. It is intended as a resource to help guide the delivery and assessment of the unit. Indicative content is NOT a statement of material which must be covered and evidenced for assessment.

An indication of typical areas of learning includes the following

Learning Outcome 1. Know about safe working practices when using MAG welding equipment

1.1 PPE used to include safety footwear, flame proof overalls, welding gauntlets, welding hand screen/head screen, use of the filter and plain glasses in welding screens and safety spectacles, responsibility of employers and employees.

1.2 Identify associated risks – fumes, burns, radiation, hot metal, confined spaces, waste materials, electric shock, stray arcs, and enrichment of the ambient atmosphere.

1.3 Fire prevention and emergency procedures – siting of fire extinguishers, emergency switches, workshop exits, location and purpose of fuses and electrical isolation switches, extraction, protective clothing and equipment.

1.4 Identify groups of safety signs - warning sign – a sign giving warning of a hazard or danger (e.g. 'danger: electricity'); prohibition sign – a sign prohibiting behaviour likely to increase or cause danger (e.g. 'no access for unauthorised persons'); mandatory sign – a sign prescribing specific behaviour (e.g. 'eye protection must be worn'); information sign – a sign giving information on emergency exits, first aid, or rescue facilities (e.g. 'emergency exit/escape route').

Learning Outcome 2. Know about the equipment used for MAG welding

2.1 Equipment – Identify, state the function of and safely connect components e.g. rectifier, inverter, welding leads, returns and

earth, welding torch, shielding gas supply, regulator and flow meter.

2.2 Ancillary equipment and tools – wire brush to clean the joint area adjacent to the weld (and the weld itself), a pair of clear lens goggles or a face shield to protect the eyes (lenses should be shatter-proof and non-flammable).

Learning Outcome 3. Know about welding consumables used in MAG welding

3.1 Electrode wire storage conditions – warm, dry, free from moisture, off the floor, avoid damp areas, avoidance of wire copper coating damage, and consider the weight of the spool for manual handling requirements.

3.2 Electrode wire identification – wire contents, electrode wire diameter to current standards.

Learning Outcome 4. Know about material reparation and the setting up of MAG welding equipment

4.1 Safety checks – welding screen condition, cable size and condition, abrasions, bare wires, connections, operation of the fume extraction system.

4.2 Prepare to carry out MAG welding – methods of distortion control – pre-setting, restraint, weld sequence, chills, joint preparation, pre/post heating.

4.3 Identify welding parameters to achieve butt and fillet welds - welding current and arc voltage, identify and set OCV, slope and tilt angles of welding torch, speed of travel, arc length, type of transfer used (dip, pulsed arc, spray) and electrode polarity.

Learning Outcome 5. Be able to complete welds on low carbon steel, stainless steel or aluminium using the MAG process

5.1 Complete weld on low carbon steel (in material 6mm in thickness), stainless steel or aluminium (in materials 3mm in thickness) - edge preparations and joint set up for lap fillets, open outside corner fillet, tee fillet and single vee butt welds. Select the welding current, open circuit voltage and arc voltage. Identify and select to achieve butt and fillet welds on low carbon steel. Techniques of striking, maintaining and breaking the arc and electrode manipulation. Identify and select to achieve butt and fillet welds on low carbon steel.

Learning Outcome 6. Know how to carry out and report on the inspection of butt and fillet welded joints

6.1 Limitation of visual inspection – reference to a person's eye sight, only show surface defects. Conditions for viewing - good lighting conditions, view when cold, weld and parent plate area needs to be free from surface contaminates - paint, oxides, slag, spatter.

6.2 Identify and describe typical welding defects – causes (poor welding technique, arc length, speed of travel, electrode slope and tilt angles) and prevention of undercutting, cracks, slag inclusions, porosity, arc craters and lack of penetration.

6.3 Carry out visual inspection checks - use viewing aids which will enhance the inspection process: magnifying glass – to enhance the viewing of visual inspection of welded joints
Fillet weld gauges – assess the size of completed welds (leg lengths, throat thickness).
Welding gauge – measure leg length, throat thickness, weld preparation angles, depth of undercut, weld profile measurements
Profile gauge – assess the shape and profile of completed butt and fillet welds.

6.4 Completion of report documentation - inspection report to provide a record and must include: date of test, name of welder, name of inspector, welding standard required, identification of weld joint/s, method of welding, joint type, type of inspection used, drawing/sketch of weld showing defects located, position and type, action to be taken and additional comments.

Learning Outcome 7. Know how to carry destructive tests on completed MAG welded joints

7.1 Prepare and carry out a destructive test on a fillet weld – macro-etch test, nick break test (health and safety procedures to be followed at all times).

7.2 Prepare and carry out a destructive test on a single vee butt weld – macro-etch test, nick break test, root and face bend tests (health and safety procedures to be followed at all times).

Learning Outcome 8. Know about documentation relating to welding activities

8.1 Identify appropriate documentation - use of a WPS (welding procedure sheet) to give information to the welder on the criteria required to produce a weld that will meet the required quality standard. Contents of WPS (welding procedure sheets) should

include: joint type, method of preparation, joint set up, welding process, consumables, welding parameters used, welding position, and details of special applications (pre/post heating).
Carry out checks as required and complete a weld inspection report.

Teaching Strategies and Learning Activities

Centres should adopt a delivery approach which supports the development of their particular learners. The aims and aspirations of all learners, including those with identified specific needs, including learning difficulties/disabilities, should be considered and appropriate support mechanisms put in place.

Health and safety aspects of fabrication and welding practice should be reinforced within all practical units.

Learning should be delivered through a combination of learner-centred classroom sessions, workshop practice and individual guided learning. The emphasis is on practical learning opportunities and individual action plans. The prospective learning group is likely to require a good deal of tutor support in achieving the planned outcomes.

It is suggested that a simulated working atmosphere/environment should be adopted. In addition, learners should be provided with real work experiences wherever possible and visits to places of interest and co-operation with local engineering establishments are strongly recommended.

Delivery may be enhanced by:

- liaising with employers with reference to delivery, work experience and/or resources
- visits to appropriate places of interest
- the provision of information and guidance to learners on the availability and type of employment the qualification may lead to and on the progression routes available for further education and training.

Methods of Assessment

This unit will be internally assessed, internally and externally moderated.

Evidence of Achievement

ABC Awards has produced an assessment pack for this unit which is available to approved centres from the ABC Awards website.

This assessment pack contains details of the requirements of the practical tasks and examination in the ABC Level 2 Award and Certificate in Fabrication and Welding Practice. Prior to commencing the qualification(s), the learner, assessor and appointed Internal Quality Assurer should familiarise themselves with the contents of this pack and what is to be expected in order to achieve.

Additional Information

Additional guidance for delivering and assessing ABC Awards qualifications and information about Internal Quality Assurance is available on the ABC Awards web site.

4. Tungsten Inert Gas Shielded Welding – Low Carbon Steel, Stainless Steel or Aluminium

Unit Reference	R/616/1269
Level	2
Credit Value	6
Guided Learning Hours	50
Unit Summary	The unit covers the equipment and consumables required for tungsten inert gas shielded (TIG) welding and the techniques used to produce welds that meet the quality standard required. Practical weld samples covering butt and fillet welds must be welded in the flat (PA) or horizontal vertical (PB) welding positions. These are rigorously tested to show that the completed welds are structurally sound. Welding inspection techniques are also covered to give the learner the information and skills to carry out weld inspections. Health and safety is an integral part of this unit covering TIG welding activities. Learners need to be aware of the dangers of fires and the need to wear correct PPE.

Learning Outcomes The learner will:	**Assessment Criteria The learner can:**
1. Know about safe working practices when using TIG welding equipment	1.1. Identify the need to use appropriate PPE (personal protective equipment) when carrying out TIG welding activities 1.2. Identify the risks associated when welding with TIG, to include: • arc radiation burns • arc eye • burns from handling hot materials • welding fumes • dangers of using high frequency systems

	• electric shocks • fire 1.3. Identify fire prevention and emergency procedures required in the workplace, to include: • causes of fire • types of fire extinguisher used • evacuation procedures 1.4. Identify the main groups of safety signs, to include: • warning • prohibition • mandatory • information signs
2. Know about the equipment used for TIG welding	2.1. Identify the functions of the listed equipment when used with TIG welding activities, to include: • transformer/generators • transformer/rectifiers • welding inverters • high frequency units • cooling systems • welding lead • welding return lead • welding earth • welding torch • welding shrouds 2.2. Identify ancillary equipment used when welding with the TIG welding process
3. Know about welding consumables used in TIG welding	3.1. Identify suitable storage conditions for TIG filler wires 3.2. Identify the filler wires in terms of: • size by diameter • alloying additions 3.3. Identify the electrode in terms of: • size by electrode diameter • type of electrodes - alloying additions
4. Know about material preparation and the setting up of	4.1. Identify appropriate safety checks on TIG welding equipment prior to use

TIG welding equipment	4.2. Prepare to carry out the TIG welding process to produce welded joints in the PA or PB positions, to include: • production of the correct welding preparation • identify distortion control methods to be used • select the correct electrode type/size • select gas type and flow rate • select filler wire type • set the correct welding current • produce suitable tack welds • weld the joint • post welding cleaning 4.3. Identify welding parameters to be used when completing welded joints using TIG welding, to include: • welding current • electrode slope and tilt angles • filler wire slope and tilt angles • gas flow rates • arc length • electrode polarity
5. Be able to complete a weld on either low carbon steel plate, stainless steel or aluminium using the TIG welding process	5.1. Identify suitable safety checks on welding equipment prior to use 5.2. Complete welds on low carbon steel, or stainless steel or aluminium 3 mm or greater in thickness using the TIG welding process, to include as a minimum: • lap joint • open outside corner • single vee butt joint • tee fillet weld Welds to be completed in the PA or PB position
6. Know how to carry out and report on the visual inspection of butt and fillet welded joints using the TIG welding process	6.1. Describe the limitations of visual inspection on completed welded joints when using the TIG welding process 6.2. Identify and describe typical welding defects that may be found in TIG welded joints, to include: • undercut • cracks

	• tungsten inclusions • porosity • arc craters • lack of fusion • lack of penetration 6.3. Check completed welds for: • weld size to cover leg length and throat thickness • weld profile • weld appearance and uniformity • absence of surface defects 6.4. Complete the requirements for a report document on welds produced
7. Know how to carry out destructive tests on completed TIG welded joints	7.1. Prepare and carry out a destructive test on a fillet weld in accordance with the supplied drawing of the welded joint, to include: • nick break test 7.2. Prepare and carry out destructive tests on a completed single vee butt weld in accordance with the supplied drawing of the welded joint, to include: • face bend test • root bend test • fracture test
8. Know about documentation relating to welding activities	8.1. Identify appropriate documentation relating to welding activities, to include: • welding procedure specifications (WPS) • weld inspection report

Supporting Unit Information

Tungsten Inert Gas Shielded (TIG) Welding – Low Carbon Steel, Stainless Steel or Aluminium – R/616/1269 – Level 2

Indicative Content

Note: Indicative content provides an indication of the scope for the Learning Outcomes and Assessment Criteria. It is intended as a resource to help guide the delivery and assessment of the unit. Indicative content is NOT a statement of material which must be covered and evidenced for assessment.

An indication of typical areas of learning includes the following

Learning Outcome 1. Know about safe working practices when using TIG welding equipment

1.1 PPE used to include safety footwear, flame proof overalls, welding gloves, welding head screen, use of the filter and plain glasses in welding screens and safety spectacles, responsibility of employers and employees.

1.2 Identify associated risks – fumes, high frequency, burns, radiation, hot metal, confined spaces, waste materials, electric shock, stray arcs, and enrichment of the ambient atmosphere.

1.3 Fire prevention and emergency procedures – siting of fire extinguishers, emergency switches, workshop exits, location and purpose of fuses and electrical isolation switches, extraction, protective clothing and equipment.

1.4 Identify groups of safety signs - warning sign – a sign giving warning of a hazard or danger (e.g. 'danger: electricity'); prohibition sign – a sign prohibiting behaviour likely to increase or cause danger (e.g. 'no access for unauthorised persons'); mandatory sign – a sign prescribing specific behaviour (e.g. 'eye protection must be worn'); information sign – a sign giving information on emergency exits, first aid, or rescue facilities (e.g. 'emergency exit/escape route').

Learning Outcome 2. Know about the equipment used for TIG welding

2.1 Equipment – Identify, state the function of and safely connect components e.g. transformer/rectifier, inverter, high frequency unit, welding leads, returns and earth, welding torches.
2.2 Ancillary equipment and tools – wire brush to clean the joint area adjacent to the weld (and the weld itself); a pair of clear lens goggles or a face shield to protect the eyes (lenses should be shatter-proof and non-flammable).

Learning Outcome 3. Know about welding consumables used in TIG welding

3.1 Electrodes and wire storage conditions – warm, dry, free from moisture, off the floor, avoid damp areas.
3.2 Electrode and wire identification - contents, electrode and wire diameter to current standards.

Learning Outcome 4. Know about material reparation and the setting up of TIG welding equipment

4.1 Safety checks – welding screen condition, cable size and condition, abrasions, bare wires, connections, high frequency unit free of dust etc, operation of the fume extraction system.
4.2 Prepare to carry out TIG welding – methods of distortion control – pre-setting, restraint, weld sequence, chills, joint preparation, pre/post heating.
4.3 Identify welding parameters to achieve butt and fillet welds - welding current and arc voltage, identify and set OCV, slope and tilt angles of welding torch, speed of travel, arc length, and electrode polarity.

Learning Outcome 5. Be able to complete welds on low carbon steel, stainless steel or aluminium using the TIG method

5.1 Complete weld on low carbon steel 3mm or greater in thickness - edge preparations and joint set up for lap fillets, open outside corner fillet, tee fillet and single vee butt welds. Select the welding current, open circuit voltage and arc voltage. Identify and select to achieve butt and fillet welds on low carbon steel. Techniques of achieving, maintaining and breaking the arc and electrode/torch manipulation. Identify and select to achieve butt and fillet welds on low carbon steel.

Learning Outcome 6. Know how to carry out and report on the inspection of butt and fillet welded joints

6.1 Limitation of visual inspection – reference to a person's eye sight, only show surface defects. Conditions for viewing - good lighting conditions, view when cold, weld and parent plate area needs to be free from surface contaminates - paint, oxides, slag, spatter.

6.2 Identify and describe typical welding defects – causes (poor welding technique, arc length, speed of travel, electrode slope and tilt angles) and prevention of undercutting, cracks, slag inclusions, porosity, arc craters and lack of penetration.

6.3 Carry out visual inspection checks - use viewing aids which will enhance the inspection process: magnifying glass – to enhance the viewing of visual inspections of welded joints
Fillet weld gauges – assess the size of completed welds (leg lengths, throat thickness).
Welding gauge – measure leg length, throat thickness, weld preparation angles, depth of undercut, weld profile measurements
Profile gauge – assess the shape and profile of completed butt and fillet welds.

6.4 Completion of report documentation - inspection report to provide a record and must include: date of test, name of welder, name of inspector, welding standard required, identification of weld joint/s, method of welding, joint type, type of inspection used, drawing/sketch of weld showing defects located, position and type, action to be taken and additional comments.

Learning Outcome 7. Know how to carry destructive tests on completed TIG welded joints

7.1 Prepare and carry out a destructive test on a fillet weld – macro-etch test, nick break test (health and safety procedures to be followed at all times).

7.2 Prepare and carry out a destructive test on a single vee butt weld – macro-etch test, nick break test, root and face bend tests (health and safety procedures to be followed at all times).

Learning Outcome 8. Know about documentation relating to welding activities

8.1 Identify appropriate documentation - use of a WPS (welding procedure sheet) to give information to the welder on the criteria required to produce a weld that will meet the required quality standard. Contents of WPS (welding procedure sheets) should include: joint type, method of preparation, joint set up, welding

process, consumables, welding parameters used, welding position, and details of special applications (pre/post heating).
Carry out checks as required and complete a weld inspection report.

Teaching Strategies and Learning Activities

Centres should adopt a delivery approach which supports the development of their particular learners. The aims and aspirations of all learners, including those with identified specific needs, including learning difficulties/disabilities, should be considered and appropriate support mechanisms put in place.

Health and safety aspects of fabrication and welding practice should be reinforced within all practical units.

Learning should be delivered through a combination of learner-centred classroom sessions, workshop practice and individual guided learning. The emphasis is on practical learning opportunities and individual action plans. The prospective learning group is likely to require a good deal of tutor support in achieving the planned outcomes.

It is suggested that a simulated working atmosphere/environment should be adopted. In addition, learners should be provided with real work experiences wherever possible and visits to places of interest and co-operation with local engineering establishments are strongly recommended.

Delivery may be enhanced by:

- liaising with employers with reference to delivery, work experience and/or resources
- visits to appropriate places of interest
- the provision of information and guidance to learners on the availability and type of employment the qualification may lead to and on the progression routes available for further education and training.

Methods of Assessment

This unit will be internally assessed, internally and externally moderated.

Evidence of Achievement

ABC Awards has produced an assessment pack for this unit which is available to approved centres from the ABC Awards website.

This assessment pack contains details of the requirements of the practical tasks and examination in the ABC Level 2 Award and Certificate in Fabrication and Welding Practice. Prior to commencing the qualification(s), the learner, assessor and appointed Internal Quality Assurer should familiarise themselves with the contents of this pack and what is to be expected in order to achieve.

Additional Information

Additional guidance for delivering and assessing ABC Awards qualifications and information about Internal Quality Assurance is available on the ABC Awards web site.

5. Fabrication Processes – Plate

Unit Reference	J/616/1270
Level	2
Credit Value	6
Guided Learning Hours	50
Unit Summary	This unit embraces all aspects in the production of assemblies in materials greater than 3 mm in thickness. Health and Safety practice is an important aspect of this unit and as such should be prioritised when the learner is using the range of tools and equipment needed to complete the practical elements. In order to produce fabrications to a specified tolerance, the learner will be expected to have the ability to read engineering drawings, mark out materials using a range of equipment, select and use hand tools appropriate to the task being covered and apply safe working practices when working on various types of cutting, forming and welding applications.

Learning Outcomes The learner will:	**Assessment Criteria The learner can:**
1. Know about safe working practices when producing fabricated assemblies in materials greater than 3 mm in thickness	1.1. Identify the need to use appropriate PPE (personal protective equipment) when carrying out fabrication activities 1.2. Identify the risks associated with fabrication activities, to include: • handling and lifting materials greater than 3 mm in thickness • safe storage of plate materials • injuries from sharp edges/burrs on plate • effective guarding of powered machines 1.3. Identify fire prevention and emergency procedures required in the workplace, to include:

	• causes of fire • types of fire extinguisher used • evacuation procedures 1.4. Identify the main groups of safety signs, to include: • warning • prohibition • mandatory • information signs
2. Be able to read and interpret fabrication drawings	2.1. Interpret information from fabrication drawings, to include: • projection of drawing (first/third angle) • required tolerances • dimensions • scale • symbolic representations
3. Be able to use appropriate marking out instruments and tools on materials greater than 3 mm in thickness	3.1. Identify and use where appropriate the marking out instruments and tools listed: • rules and tapes • dividers • scribers • squares and protractors • centre punch 3.2. Identify methods of marking out, to include: • direct marking • using templates
4. Be able to use hand tools and powered machines to cut materials greater than 3 mm in thickness	4.1. Identify and use where appropriate the hand tools listed to a given tolerance: • hand files • hacksaws • chisels 4.2. Identify and use where appropriate the power tools/equipment listed to a given tolerance: • mechanical saw • bench drilling machine • grinding machine
5. Be able to use thermal cutting methods to cut materials greater than 3 mm in thickness	5.1. Identify safe working practices when using thermal cutting methods. 5.2. Use ONE of the listed thermal cutting methods to produce cuts in materials greater than 3 mm in thickness to a given tolerance:

	• oxy/fuel gas cutting equipment • plasma arc cutting equipment
6. Be able to use manual and powered machines to form materials greater than 3 mm in thickness	6.1. Identify and use the following manual or power forming machines: • press brake or manual folding machine to produce bends to specified angles • rolling machine to produce radii and cylinders to specified dimensions 6.2. Determine the bending allowance when folding/bending materials greater than 3 mm in thickness 6.3. Determine the length of a flat material required to produce a cylinder to a given diameter in materials greater than 3 mm in thickness
7. Know about different methods of assembling fabricated components in materials greater than 3 mm in thickness	7.1. Identify and use the following methods of assembly on materials greater than 3 mm in thickness, to include: • tack welding • bolting • drilling and tapping
8. Be able to produce fabricated assemblies in materials greater than 3 mm in thickness	8.1. Work safely to produce a fabricated assembly in materials greater than 3 mm in thickness that meets dimensional accuracy and within the stated tolerances

Supporting Unit Information

Fabrication Processes – Plate – J/616/1270 – Level 2

Indicative Content

Note: Indicative content provides an indication of the scope for the Learning Outcomes and Assessment Criteria. It is intended as a resource to help guide the delivery and assessment of the unit. Indicative content is NOT a statement of material which must be covered and evidenced for assessment.

Learning Outcome 1. Know about the working practices when producing fabricated assemblies in materials greater than 3mm in thickness

1.1 PPE used to include safety footwear, flame proof overalls, gloves, safety spectacles, responsibility of employers and employees.

1.2 Identify associated risks – handling and lifting materials following manual handling and lifting of loads regulations, correct storage of materials to prevent slips, trips, trapping and falls, injuries from sharp metal, electric shock, use of fixed, adjustable, laser, light guards on machinery.

1.3 Fire prevention and emergency procedures – siting of fire extinguishers, emergency switches, workshop exits, location and purpose of fuses and electrical isolation switches, extraction, protective clothing and equipment.

1.4 Identify groups of safety signs - warning sign – a sign giving warning of a hazard or danger (e.g. 'danger: electricity'); prohibition sign – a sign prohibiting behaviour likely to increase or cause danger (e.g. 'no access for unauthorised persons'); mandatory sign – a sign prescribing specific behaviour (e.g. 'eye protection must be worn'); information sign – a sign giving information on emergency exits, first aid, or rescue facilities (e.g. 'emergency exit/escape route').

Learning Outcome 2. Be able to read and interpret fabrication drawings

2.1 Interpreting information – detail contained in information boxes, first and third angle projection, weld symbols, diameter and square, datum, reference and centre lines, arrow lines, bend lines, hidden detail, cross section.

Learning Outcome 3. Be able to use appropriate marking out instruments and tools on materials greater than 3mm in thickness

3.1 Identify and use common marking out tools – rules, tapes, dividers, trammels, callipers, scribers, chalk line, centre and nipple punch, back mark, flange square, bevel gauges, protractor and squares.

3.2 Identify methods of marking out – direct marking using scribers, chalk, permanent markers, chalk line. Tools used to produce straight lines, parallel lines, circumferences and lines square to each other. Accurate measurement to avoid cumulative error particularly relative to string dimensions. Tools used to produce straight lines, parallel lines, circumferences and lines square to each other. Indication of error obtained using dividers as compared to calculations when determining circumference length.
Identifying the most economic manner of nesting components and recognise the advantages of using templates compared with the direct marking method. Checking marked sizes to drawing specifications (diagonals etc.).
The common sections used in fabrication and tolerances due to rolling margin, e.g. universal beam(UB), universal column(UC), British Standard equal and unequal angle(RSA), parallel faced channel(PFC), rolled steel joist(RSJ), cold rolled closed annealed steel sheet, rolled hollow section(RHS), square and rectangular, flat bar, pipe and tube.

Learning Outcome 4. Be able to use hand tools and powered machines to cut materials greater than 3mm in thickness

4.1 Use of hand tools - files, chisels, hacksaws and shears
Common portable power tools, grinder, jig saw, drill, nibbler, reciprocating shears.

4.2 Use of power tools to remove metal – mechanical saw, guillotine, drilling machines, grinding machines - straight, angle and static grinders.

Learning Outcome 5. Be able to use thermal cutting methods to cut materials greater than 3 mm in thickness

5.1 Identify safe working practices when using thermal cutting methods – equipment, use of flash back arrestors, hose check valves, regulators, safety checks on hoses etc.

5.2 Produce cuts in materials greater than 3 mm in thickness to a given tolerance: use of oxy/fuel gas cutting equipment, plasma arc cutting equipment.

Learning Outcome 6. Be able to use manual and powered machines to form materials greater than 3 mm in thickness

6.1 Identify and use manual or power forming machines – folders, fly press, press brake or manual folding machine to produce bends to specified angles, rolling machine to produce radii and cylinders to specified dimensions using manual, section, pinch and pyramid rolls.

6.2 Determine the bending allowance when folding/bending materials greater than 3 mm in thickness, allowances for simple bends, sequence of bends and spring back of materials.

6.3 Determine the length of a flat material required to produce a cylinder to a given diameter in materials greater than 3 mm in thickness– using mean line calculations.

Learning Outcome 7. Know about different methods of assembling fabricated components in materials greater than 3 mm in thickness

7.1 Identify and use methods of assembly on materials greater than 3 mm in thickness - tack welding, bolting, drilling and tapping (size, type and distance apart).
Assembly aids: drifts, cleats, wedges, bridges, clamps, dogs, podgers to control distortion produce alignment and achieve dimensional accuracy in fabrications.

Learning Outcome 8. Be able to produce fabricated assemblies in materials greater than 3 mm in thickness

8.1 Work safely to produce a fabricated assembly in materials greater than 3 mm in thickness - meeting dimensional accuracy and within the stated tolerances on drawings.

Teaching Strategies and Learning Activities

Centres should adopt a delivery approach which supports the development of their particular learners. The aims and aspirations of all learners, including those with identified specific needs, including learning difficulties/disabilities, should be considered and appropriate support mechanisms put in place.

Health and safety aspects of fabrication and welding practice should be reinforced within all practical units.

Learning should be delivered through a combination of learner-centred classroom sessions, workshop practice and individual guided learning. The emphasis is on practical learning opportunities and individual action plans. The prospective learning group is likely to require a good deal of tutor support in achieving the planned outcomes.

It is suggested that a simulated working atmosphere/environment should be adopted. In addition, learners should be provided with real work experiences wherever possible and visits to places of interest and co-operation with local engineering establishments are strongly recommended.

Delivery may be enhanced by:

- liaising with employers with reference to delivery, work experience and/or resources
- visits to appropriate places of interest
- the provision of information and guidance to learners on the availability and type of employment the qualification may lead to and on the progression routes available for further education and training.

Methods of Assessment

This unit will be internally assessed, internally and externally moderated.

Evidence of Achievement

ABC Awards has produced an assessment pack for this unit which is available to approved centres from the ABC Awards website.

This assessment pack contains details of the requirements of the practical tasks and examination in the ABC Level 2 Award and Certificate in Fabrication and Welding Practice. Prior to commencing the qualification(s), the learner, assessor and appointed Internal Quality Assurer should familiarise themselves with the contents of this pack and what is to be expected in order to achieve.

Additional Information

Additional guidance for delivering and assessing ABC Awards qualifications and information about Internal Quality Assurance is available on the ABC Awards web site.

6. Fabrication Processes – Sheet Metal

Unit Reference	L/616/1271
Level	2
Credit Value	6
Guided Learning Hours	50
Unit Summary	This fabrication unit embraces all aspects in the production of assemblies in materials less than 3 mm in thickness. Health and Safety practice is an important aspect of this unit and as such should be prioritised when the learner is using the range of tools and equipment needed to complete the practical elements. In order to produce fabrications to a specified tolerance, the learner will be expected to have the ability to read engineering drawings, mark out materials using a range of equipment, select and use hand tools appropriate to the task being covered and apply safe working practices when working on various types of cutting, forming and joining applications.

Learning Outcomes The learner will:	**Assessment Criteria The learner can:**
1. Know about safe working practices when producing fabricated assemblies in materials less than 3 mm in thickness	1.1. Identify the need to use appropriate PPE (personal protective equipment) when carrying out fabrication activities 1.2. Identify the risks associated with fabrication activities, to include: • handling and lifting materials less than 3 mm in thickness • safe storage of plate/sheet materials • injuries from sharp edges/burrs on plate • effective guarding of powered machines 1.3. Identify fire prevention and emergency procedures required in the workplace, to include:

	• causes of fire • types of fire extinguisher used • evacuation procedures 1.4. Identify the main groups of safety signs, to include: • warning • prohibition • mandatory • information signs
2. Be able to read and interpret fabrication drawings	2.1. Interpret information from fabrication drawings, to include: • projection of drawing (first/third angle) • required tolerances • dimensions • scale • symbolic representations
3. Be able to use appropriate marking out instruments and tools on materials less than 3 mm in thickness	3.1. Identify and use where appropriate the marking out instruments and tools listed: • rules and tapes • dividers • scribers • squares and protractors • centre punch 3.2. Identify methods of marking out, to include: • direct marking • using templates
4. Be able to use hand tools and powered machines to cut materials less than 3 mm in thickness	4.1. Identify and use where appropriate the hand tools listed to a given tolerance: • hand files • hacksaws • tin snips 4.2. Identify and use where appropriate the power tools/equipment listed to a given tolerance: • mechanical saw • bench drilling machine • shears • reciprocating shear
5. Be able to use manual and powered machines to form materials less	5.1. Identify and use the following manual or power forming equipment/machines: • press brake or manual folding machine to produce bends to specified angles • folding bars

than 3 mm in thickness	• rolling machine to produce radii and cylinders to specified dimensions 5.2. Determine the bending allowance when folding/bending materials less than 3 mm in thickness 5.3. Determine the length of a flat material required to produce a cylinder to a given diameter in materials less than 3 mm in thickness
6. Know different methods of assembling fabricated components in materials less than 3 mm in thickness	6.1. Identify and use the following methods of assembly for materials less than 3 mm in thickness, to include: • self secured joints • resistance welding techniques • mechanical fasteners 6.2. Identify methods of stiffening sheet metal components
7. Be able to produce fabricated assemblies in materials less than 3 mm in thickness	7.1. Work safely to produce a fabricated assembly in materials less than 3 mm in thickness that meets dimensional accuracy and within the stated tolerances

Supporting Unit Information

Fabrication Processes – Sheet Metal – L/616/1271 – Level 2

Indicative Content

Note: Indicative content provides an indication of the scope for the Learning Outcomes and Assessment Criteria. It is intended as a resource to help guide the delivery and assessment of the unit. Indicative content is NOT a statement of material which must be covered and evidenced for assessment.

Learning Outcome 1. Know about the working practices when producing fabricated assemblies in materials greater than 3mm in thickness

1.1 PPE used to include safety footwear, flame proof overalls, gloves, safety spectacles, responsibility of employers and employees.

1.2 Identify associated risks – handling and lifting materials following manual handling and lifting of loads regulations, correct storage of materials to prevent slips, trips, trapping and falls, injuries from sharp metal, electric shock, use of fixed, adjustable, laser, light guards on machinery.

1.3 Fire prevention and emergency procedures – siting of fire extinguishers, emergency switches, workshop exits, location and purpose of fuses and electrical isolation switches, extraction, protective clothing and equipment.

1.4 Identify groups of safety signs - warning sign – a sign giving warning of a hazard or danger (e.g. 'danger: electricity'); prohibition sign – a sign prohibiting behaviour likely to increase or cause danger (e.g. 'no access for unauthorised persons'); mandatory sign – a sign prescribing specific behaviour (e.g. 'eye protection must be worn'); information sign – a sign giving information on emergency exits, first aid, or rescue facilities (e.g. 'emergency exit/escape route').

Learning Outcome 2. Be able to read and interpret fabrication drawings

2.1 Interpreting information – detail contained in information boxes, first and third angle projection, weld symbols, diameter and square, datum, reference and centre lines, arrow lines, bend lines, hidden detail, cross section.

Learning Outcome 3. Be able to use appropriate marking out instruments and tools on materials less than 3mm in thickness

3.1 Identify and use common marking out tools – rules, tapes, dividers, trammels, callipers, scribers, chalk line, centre and nipple punch, back mark, flange square, bevel gauges, protractor and squares.

3.2 Identify methods of marking out – direct marking using scribers, chalk, permanent markers, chalk line. Tools used to produce straight lines, parallel lines, circumferences and lines square to each other. Accurate measurement to avoid cumulative error particularly relative to string dimensions. Tools used to produce straight lines, parallel lines, circumferences and lines square to each other. Indication of error obtained using dividers as compared to calculations when determining circumference length.
Identify the most economic manner of nesting components and recognise the advantages of using templates compared with the direct marking method. Checking marked sizes to drawing specifications (diagonals etc.)

Learning Outcome 4. Be able to use hand tools and powered machines to cut materials less than 3mm in thickness

4.1 Use of hand tools - files, chisels, hacksaws and tin snips/hand shears
Common portable power tools, grinder, jig saw, drill, nibbler, reciprocating shears.

4.2 Use of power tools to remove metal – mechanical saw, guillotine, drilling machines, reciprocating shears.

Learning Outcome 5. Be able to use manual and powered machines to form materials less than 3 mm in thickness

5.1 Identify and use manual or power forming machines – folders, fly press, press brake or manual folding machine to produce bends to specified angles, folding bars, rolling machine to produce radii and cylinders to specified dimensions using manual, section, pinch and pyramid rolls.

5.2 Determine the bending allowance when folding/bending materials greater than 3 mm in thickness, allowances for simple bends, sequence of bends and spring back of materials.

5.3 Determine the length of a flat material required to produce a cylinder to a given diameter in materials less than 3 mm in thickness – using mean line calculations.

Learning Outcome 6. Know about different methods of assembling fabricated components in materials less than 3 mm in thickness

6.1 Identify and use methods of assembly on materials less than 3 mm in thickness – self secured joints (Grooved seam, double groove seam, paned down seam, knocked up seam), resistance welding techniques (spot and seam) mechanical fasteners (bolts and screws).

6.2 Identify methods of stiffening sheet metal components – bending and folding, control of distortion, produce alignment and achieve dimensional accuracy in fabrications.

Learning Outcome 7. Be able to produce fabricated assemblies in materials greater than 3 mm in thickness

7.1 Work safely to produce a fabricated assembly in materials greater than 3 mm in thickness - meeting dimensional accuracy and within the stated tolerances on drawings.

Teaching Strategies and Learning Activities

Centres should adopt a delivery approach which supports the development of their particular learners. The aims and aspirations of all learners, including those with identified specific needs, including learning difficulties/disabilities, should be considered and appropriate support mechanisms put in place.

Health and safety aspects of fabrication and welding practice should be reinforced within all practical units.

Learning should be delivered through a combination of learner-centred classroom sessions, workshop practice and individual guided learning. The emphasis is on practical learning opportunities and individual action plans. The prospective learning group is likely to require a good deal of tutor support in achieving the planned outcomes.

It is suggested that a simulated working atmosphere/environment should be adopted. In addition, learners should be provided with real work experiences wherever possible and visits to places of interest and co-operation with local engineering establishments are strongly recommended.

Delivery may be enhanced by:

- liaising with employers with reference to delivery, work experience and/or resources
- visits to appropriate places of interest
- the provision of information and guidance to learners on the availability and type of employment the qualification may lead to and on the progression routes available for further education and training.

Methods of Assessment

This unit will be internally assessed, internally and externally moderated.

Evidence of Achievement

ABC Awards has produced an assessment pack for this unit which is available to approved centres from the ABC Awards website.

This assessment pack contains details of the requirements of the practical tasks and examination in the ABC Level 2 Award and Certificate in Fabrication and Welding Practice. Prior to commencing the qualification(s), the learner, assessor and appointed Internal Quality Assurer should familiarise themselves with the contents of this pack and what is to be expected in order to achieve.

Additional Information

Additional guidance for delivering and assessing ABC Awards qualifications and information about Internal Quality Assurance is available on the ABC Awards web site.

7. Engineering Drawing Using Manual and CAD Techniques

Unit Reference	R/616/1272
Level	2
Credit Value	6
Guided Learning Hours	50
Unit Summary	By following this unit, learners will be able to produce drawings using both manual methods and computer-aided design (CAD) techniques. Accuracy and presentation are key elements in this unit.

Learning Outcomes The learner will:	**Assessment Criteria The learner can:**
1. Be able to produce engineering drawings using manual drawing methods	1.1. Select and use appropriate drawing equipment 1.2. Produce an orthographic drawing in: • first angle projection or • third angle projection 1.3. For the completed drawing in 1.2 show: • full details of each elevation • hidden detail • dimensions to current standards • title box showing all relevant details • appropriate symbols to current standards • drawn to scale
2. Be able to set up the software when using CAD	2.1. Select a suitable software system 2.2. Set up system prior to drawing, to include: • types, thickness and colour of lines • paper size limits • orthographic co-ordinates • appropriate grid and snap references
3. Be able to produce	3.1. Use CAD to produce geometric shapes

engineering drawings using a CAD system	3.2. Produce orthographic drawings in first or third angle projection of fabricated assemblies. The completed drawing should include: • full details of each elevation • hidden detail • dimensions to current standards • title box showing all relevant details • appropriate symbols to current standards • drawn to scale
4. Be able to produce pattern developments using CAD	4.1. Use the radial line method to develop full and half patterns 4.2. Use the parallel line method to develop full and half patterns 4.3. Produce hard copies of the completed pattern developments
5. Be able to store, retrieve and print drawings	5.1. Select a suitable method to store/save part and completed drawings 5.2. Retrieve the drawing from a password protected filing system 5.3. Produce a printed copy of the completed drawing
6. Be able to close down the CAD system safely	6.1. Carry out the correct procedure to ensure that the CAD system is closed down in a safe manner

Supporting Unit Information

Engineering Drawing Using Manual and CAD Techniques – R/616/1272 – Level 2

Indicative Content

Note: Indicative content provides an indication of the scope for the Learning Outcomes and Assessment Criteria. It is intended as a resource to help guide the delivery and assessment of the unit. Indicative content is NOT a statement of material which must be covered and evidenced for assessment.

Learning Outcome 1: Be able to produce engineering drawings using manual drawing methods

1.1 Select and use appropriate drawing equipment such as rule, eraser, correct grade of pencil, pens, technical pens, protractor, set squares 60°/30° and 45°/90°, compasses, Tee square, flexi/French curves and drawing accessories.

1.2 Produce an orthographic drawing in first angle projection or third angle projection of objects produced in the fabrication and welding industry

1.3 The completed drawing should show full details of each elevation, hidden detail, dimensions to current standards, title box showing all relevant details such as title of drawing, drawn by, scale, date, tolerances, projection symbol, and units of measurement, appropriate symbols to current standards and drawn to scale.

Learning Outcome 2: Be able to set up the software when using CAD

2.1 Select a suitable software system - 2D and 3D.

2.2 Set up system prior to drawing to cover types, thickness and colour of lines, paper size limits, orthographic co-ordinates and appropriate grid and snap references.

Learning Outcome 3: Be able to produce engineering drawings using a CAD system

3.1 Use CAD to produce geometric shapes as used in the fabrication and welding industry, select suitable 2D software systems, set up layers to include types, thickness and colour of lines, set up paper size limits to standard A4, set up x-y co-ordinates, set up appropriate

grid and snap references. Use CAD to produce geometric shapes to include circles, ellipses, triangles, regular and irregular polygons.

3.2 Produce orthographic drawings in first or third angle projection of fabricated assemblies. The completed drawing should cover full details of each elevation, hidden detail, dimensions to current standards, title box showing all relevant details, appropriate symbols to current standards and drawn to scale. Save part and fully completed drawings using the CAD system using appropriate file names. Retrieve part and completed drawings from the CAD system and print hard copies.

Learning Outcome 4: Be able to produce pattern developments using CAD

4.1 Use the radial line method to develop full and half patterns – the radial line method of pattern development is used to develop patterns for objects that have a tapering form with lines converging to a common point, called the apex point. The radial line method uses a series of radial generator lines drawn from a common apex point to develop a specified pattern or shape. Developing right cones, frustum of a right cone and pyramids.

4.2 Use the parallel line method to develop full and half patterns – Parallel line development is used to develop patterns of square, rectangular and cylindrical shapes (prisms).

4.3 Produce hard copies of the completed pattern developments.

Learning Outcome 5: Be able to store, retrieve and print drawings

5.1 Select a suitable method to store/save part and completed drawings.

5.2 Retrieve the drawing from a password protected filing system.

5.3 Produce a printed copy of the completed drawing.

Learning Outcome 6: Be able to close down the CAD system safely

6.1 Carry out the correct procedure to ensure that the CAD system is closed down in a safe manner.

Teaching Strategies and Learning Activities

Centres should adopt a delivery approach which supports the development of their particular learners. The aims and aspirations of all learners, including those with identified specific needs, including learning difficulties/disabilities, should be considered and appropriate support mechanisms put in place.

Health and safety aspects of fabrication and welding practice should be reinforced within all practical units.

Learning should be delivered through a combination of learner-centred classroom sessions, workshop practice and individual guided learning. The emphasis is on practical learning opportunities and individual action plans. The prospective learning group is likely to require a good deal of tutor support in achieving the planned outcomes.

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- liaising with employers with reference to delivery, work experience and/or resources
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Methods of Assessment

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Evidence of Achievement

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Appendices

Recognition of Prior Learning, Exemption and Credit Transfer

ABC Awards policy enables learners to avoid duplication of learning and assessment in a number of ways:

- Recognition of Prior Learning (RPL) – a method of assessment that considers whether a learner can demonstrate that they can meet the assessment requirements for a unit through knowledge, understanding or skills they already possess and do not need to develop through a course of learning.
- Exemption - Exemption applies to any certificated achievement which is deemed to be of equivalent value to a unit within ABC qualification but which does not necessarily share the exact learning outcomes and assessment criteria. It is the assessor's responsibility, in conjunction with the Internal Moderator, to map this previous achievement against the assessment requirements of the ABC qualification to be achieved in order to determine its equivalence. Any queries about the relevance of any certificated evidence, should be referred in the first instance to your centre's internal moderator and then to ABC.
  It is important to note that there may be restrictions upon a learner's ability to claim exemption or credit transfer which will be dependent upon the currency of the unit/qualification and a learner's existing levels of skill or knowledge.
  Where past certification only provides evidence that could be considered for exemption of part of a unit, learners must be able to offer additional evidence of previous or recent learning to supplement their evidence of achievement.
- Credit Transfer – ABC may attach credit to a qualification, a unit or a component. Credit transfer is the process of using certificated credits achieved in one qualification and transferring that achievement as a valid contribution to the award of another qualification. Units / Components transferred must share the same learning outcomes and assessment criteria along with the same unit number. Assessors must ensure that they review and verify the evidence through sight of:
  - original certificates OR
  - copies of certificates that have been signed and dated by the internal moderator confirming the photocopy is a real copy

and make these available for scrutiny be the External Moderator.

- Equivalencies – opportunities to count credits from the unit(s) from other qualifications or from unit(s) submitted by other recognised organisations towards the place of mandatory or optional unit(s) specified in the rule of combination. The unit must have the same credit value or greater than the unit(s) in question and be at the same level or higher.

ABC encourages its centres to recognise the previous achievements of learners through RPL, Exemption and Credit Transfer. Prior achievements may have resulted from past or present employment, previous study or voluntary activities.

Centres should provide advice and guidance to the learner on what is appropriate evidence and present that evidence to the external moderator in the usual way.

Further guidance can be found in 'Delivering and Assessing ABC Qualifications' which can be downloaded from http://www.abcawards.co.uk/centres-2/policies-procedures/

Certification

Learners will be certificated for all units and qualifications that are achieved and claimed.

ABC's policies and procedures are available on the ABC website.

Glossary of Terms

Guided Learning Hours (GLH)
GLH is where the learner participates in education or training under the immediate guidance or supervision of a tutor (or other appropriate provider of education or training). It may be helpful to think – 'Would I need to plan for a member of staff to be present to give guidance or supervision?'

GLH is calculated at the unit/component level and added up at the qualification level.

Examples of guided learning include:

- Face-to-face meeting with a tutor
- Telephone conversation with a tutor
- Instant messaging with a tutor
- Taking part in a live webinar
- Classroom-based instruction
- Supervised work
- Taking part in a supervised or invigilated assessment
- The learner is being observed.

Total Qualification Time (TQT)

'The number of notional hours which represents an estimate of the total amount of time that could reasonably be expected to be required, in order for a learner to achieve and demonstrate the achievement of the level of attainment necessary for the award of a qualification.' The size of a qualification is determined by the TQT.

TQT is made up of the GLH plus all other time taken in preparation, study or any other form of participation in education or training but not under the direct supervision of a lecturer, supervisor or tutor.

TQT is calculated at qualification level and not unit/component level.

Examples of unsupervised activities that could contribute to TQT include:

- Researching a topic and writing a report
- Watching an instructional online video at home/e-learning
- Watching a recorded webinar
- Compiling a portfolio in preparation for assessment
- Completing an unsupervised practical activity or work
- Rehearsing a presentation away from the classroom
- Practising skills unsupervised
- Requesting guidance via email – will not guarantee an immediate response.