



Part of the
Enginuity Group

Qualification Manual

EAL Level 3 Diploma in Advanced Manufacturing and
Engineering – Fabricator
(Development Competence)
Qualification Number: 603/2621/9

Issue B



Table of Contents

| | | |
|-----|---|----|
| 1.0 | About EAL..... | 2 |
| 2.0 | Introduction to the Qualification..... | 3 |
| 3.0 | Qualification Structure..... | 5 |
| 4.0 | Centre and Qualification Approval..... | 8 |
| 5.0 | Profiles and Requirements..... | 9 |
| 6.0 | Assessment..... | 12 |
| 7.0 | Quality Control of Assessments..... | 15 |
| | Appendix 1: Unit Summaries..... | 16 |
| | Appendix 2: Learner Registration and Certification..... | 17 |



1.0 About EAL

For over fifty years, EAL has been the specialist awarding organisation for engineering, manufacturing, building services and related sectors. Developed to the highest technical standards, our qualifications reflect ever-changing industry and regulatory needs. We support the providers of our qualifications with an unparalleled level of service to ensure that learners are well prepared to take the next step in their journeys, whether study, an apprenticeship or work.

Through industry partnerships with EAL centres and training providers, decades of experience supporting our core sectors, and our role as part of the Enginuity Group, we have built unrivalled knowledge and understanding of employer skills needs. As a result, EAL's skills solutions, including apprenticeship End-Point Assessment, External Quality Assurance and qualifications are respected and chosen by employers to deliver real lifelong career benefits for all our learners. That's why in the last ten years, 1.2 million people across the UK have taken EAL qualifications.

1.1 Equal Opportunities and Diversity

EAL expects its centres to enable learners to have equal access to training and assessment for qualifications in line with equalities legislation. Further details can be located in the EAL Equal Opportunities and Diversity Policy:

<http://www.eal.org.uk/centre-support/centre-support/policies-and-important-documents>

1.2 Customer Experience and Feedback

Customer Experience is a fundamental part of EAL's commitment to you. EAL aims to ensure that all customers receive a high-quality efficient service. We are always interested in feedback and if you have any comments or feedback on our qualifications, products or services, please contact the Customer Experience team:

EAL Customer Experience

Tel: +44 (0)1923 652 400

Email: Customer.Experience@eal.org.uk

2.0 Introduction to the Qualification

2.1 Qualification Support Materials

The following assessment support materials are available for this qualification:

- Units of competence

This qualification is made up of a number of units of competence, which EAL has derived from the Employer Units of Competence (EUC) which set out the collective performance and skills requirements and underpinning knowledge requirements. These documents allow both the apprentices and the assessor to record the progress through the qualification. The units contain the performance to be assessed, the knowledge to be assessed and the evidence required from the apprentices to demonstrate their skills.

All units in this qualification contain the following information:

- Apprenticeship sector and unit title
- Unit summary
- Performance and skills to be assessed and evidenced
- Underpinning knowledge to be assessed and evidenced.

2.2 Learner's Portfolio Building and Referencing

For guidance to assessment and exemplars on completing documentation including assessment planning documentation refer to EAL centre guidance.

For further information please contact:

EAL Customer
Experience Tel: +44(0)1923 652 400
Email: Customer.Experience@eal.org.uk

2.3 Achievement of the Qualification

The qualification is achieved when all the necessary units have been completed. The centre will then be able to apply for the learner's certificate of achievement. The learners will also receive a certificate of unit credit, listing all the units they have achieved.

This manual must be used in conjunction with the delivery and assessment of any individual units to ensure that assessment requirements and methodologies are consistently applied.

EAL Level 3 Diploma in Advanced Manufacturing and Engineering
– Fabricator (Development Competence)

Apprenticeships covered by this qualification manual are:

- (ST0607) Metal Fabricator - Level 3

The apprenticeship standard and the assessment plan for this apprenticeship can be found here:

<https://www.instituteforapprenticeships.org/apprenticeship-standards/>



Part of the
Enginuity Group

There are various other qualifications which this qualification could relate to. Details on these can be obtained from the EAL website or alternatively contact:

EAL Customer
Experience Tel: +44(0)1923 652 400
Email: Customer.Experience@eal.org.uk

3.0 Qualification Structure

3.1 Rule of Combination

This qualification has **816** Guided Learning Hours (GLH) and has a Total Qualification Time (TQT) of **816** hours, the notional time required by the learner to complete the qualification.

The learner must complete the required number of mandatory units of competence, followed by the required number of optional units of competence from one of the following Pathways:

- Pathway 1: Sheetmetal worker
- Pathway 2: Plater/Fabricator
- Pathway 3: Fabricator Joiner.

Mandatory Units:

The learner must complete all **three** units:

| EAL Code | Unit Title | GLH | Ofqual Code |
|-----------|---|-----|-------------|
| AUEC3-001 | Complying with statutory regulations and organisational safety requirements | 13 | Y/615/3996 |
| AUEC3-002 | Using and interpreting engineering data and documentation | 13 | D/615/3997 |
| AUEC3-003 | Working efficiently and effectively in advanced manufacturing and engineering | 42 | K/615/3999 |

Pathway 1: Sheetmetal worker

The learner must complete all **three** units:

| EAL Code | Unit Title | GLH | Ofqual Code |
|-----------|--|-----|-------------|
| AUEC3-280 | Marking out components for metalwork | 189 | L/616/6924 |
| AUEC3-281 | Cutting sheetmetal to shape using hand and machine tools | 329 | Y/616/6926 |
| AUEC3-282 | Forming sheetmetal using hand and machine tools | 379 | D/616/6927 |

Plus **two** units from the following:

| | | | |
|-----------|--|-----|------------|
| AUEC3-283 | Producing sheetmetal assemblies | 409 | H/616/6928 |
| AUEC3-284 | Heat treating materials for fabrication activities | 99 | K/616/6929 |
| AUEC3-285 | Developing and marking out templates for metalwork | 259 | D/616/6930 |

Plus **one** units from the following:

| | | | |
|-----------|---|-----|------------|
| AUEC3-286 | Joining fabricated components using mechanical fasteners | 189 | K/616/6932 |
| AUEC3-287 | Bonding engineering materials using adhesives | 119 | M/616/6933 |
| AUEC3-288 | Joining materials by resistance spot welding | 49 | T/616/6934 |
| AUEC3-289 | Producing fillet welded joints using a manual welding process | 739 | A/616/6935 |

| | | | |
|-----------|-------------------------------------|-----|------------|
| AUEC3-305 | Operating CNC fabrication equipment | 379 | D/616/6944 |
|-----------|-------------------------------------|-----|------------|

Pathway 2: Plater/Fabricator

The learner must complete all **three** units:

| EAL Code | Unit Title | GLH | Ofqual Code |
|-----------|--|-----|-------------|
| AUEC3-280 | Marking out components for metalwork | 189 | L/616/6924 |
| AUEC3-285 | Developing and marking out templates for metalwork | 259 | D/616/6930 |

Plus **one** units from the following:

| | | | |
|-----------|--|-----|------------|
| AUEC3-290 | Cutting plate and sections using shearing machines | 259 | F/616/6936 |
| AUEC3-291 | Cutting and shaping materials using portable thermal cutting equipment | 329 | J/616/6937 |
| AUEC3-292 | Cutting materials using saws and abrasive discs | 109 | L/616/6938 |
| AUEC3-305 | Operating CNC fabrication equipment | 379 | D/616/6944 |

Plus **two** units from the following:

| | | | |
|-----------|--|-----|------------|
| AUEC3-293 | Bending and forming plate using press brakes or bending machines | 329 | R/616/6939 |
| AUEC3-294 | Forming platework using power rolling machines | 329 | J/616/6940 |
| AUEC3-295 | Producing and finishing holes using drilling machines | 119 | L/616/6941 |
| AUEC3-296 | Producing platework assemblies | 329 | R/616/6942 |

Plus **two** units from the following:

| | | | |
|-----------|---|-----|------------|
| AUEC3-086 | Joining fabricated components using mechanical fasteners | 189 | K/616/6932 |
| AUEC3-089 | Producing fillet welded joints using a manual welding process | 739 | A/616/6935 |
| AUEC3-097 | Slings, lifting and moving materials and components | 119 | Y/616/6943 |

Pathway 3: Fabricator Joiner

The learner must complete **one** unit from the following:

| EAL Code | Unit Title | GLH | Ofqual Code |
|--|--|------|-------------|
| AUEC2-022 | Producing sheetmetal components and assemblies | 140 | A/507/6948 |
| AUEC2-071 | Producing platework components and assemblies | 140 | J/616/6906 |
| AUEC2-020 | Forming and assembling pipework systems | 140 | M/507/6946 |
| Plus either one units from the following: | | | |
| AUEC3-306 | Welding materials by the manual metal arc process | 1729 | H/616/6945 |
| AUEC3-263 | Welding materials by the semi automatic MIG/MAG and flux cored arc processes | 1729 | L/616/6907 |
| AUEC3-264 | Welding materials by the manual TIG and plasma arc welding process | 1729 | R/616/6908 |
| AUEC3-265 | Welding materials by the manual oxy/fuel gas welding process | 1679 | Y/616/6909 |
| AUEC3-266 | Welding pipe/tube using multiple manual arc welding processes | 1779 | L/616/6910 |
| AUEC3-267 | Welding plate using multiple manual arc welding processes | 1779 | R/616/6911 |
| OR: | | | |
| One unit from the following: | | | |
| AUEC3268 | Preparing mechanised arc welding equipment for production | 679 | Y/616/6912 |
| AUEC3-269 | Preparing resistance spot, seam and projection welding machines for production | 429 | D/616/6913 |
| AUEC3-270 | Preparing laser welding machines for production | 679 | H/616/6914 |
| AUEC3-271 | Preparing electron beam welding machines for production | 679 | K/616/6915 |
| AUEC3-272 | Preparing friction welding machines for production | 629 | M/616/6916 |
| AUEC3-273 | Preparing brazing machines for production | 429 | T/616/6917 |
| Plus one unit from the following: | | | |
| AUEC3-274 | Welding materials with mechanised arc welding equipment | 349 | A/616/6918 |
| AUEC3-275 | Welding materials using resistance spot, seam and projection welding machines | 329 | F/616/6919 |
| AUEC3-276 | Welding materials using laser welding machine | 349 | T/616/6920 |
| AUEC3-277 | Welding materials using electron beam welding machines | 349 | A/616/6921 |
| AUEC3-278 | Welding materials using friction welding machines | 329 | F/616/6922 |
| AUEC3-279 | Joining materials using brazing machines | 179 | J/616/6923 |



4.0 Centre and Qualification Approval

Centres wishing to run this qualification will need to comply with this qualification manual and EAL's centre approval criteria for the qualification. Centres must also put in place the appropriate physical and human resources and administration systems to deliver the qualification effectively.

For **existing** EAL centres to put this qualification on your centre remit:
Create and complete a qualification approval application form in Smarter Touch and submit to EAL.

For non EAL centres to gain centre approval to run this qualification, EAL Customer Experience will be happy to help. Please contact them on:

EAL Customer
Experience Tel: +44(0)1923 652 400
Email: Customer.Experience@eal.org.uk

5.0 Profiles and Requirements

5.1 Staff Responsible for Registering and Certification of Learners

Centres are required to appoint a suitable member of staff who can take responsibility for registering learners onto qualifications, submitting entries for assessments to EAL, and taking receipt of external assessment procedures (if appropriate). They may also be responsible for applying to EAL for learner certificates. The role may be undertaken by the same person who undertakes quality assurance.

5.2 Learners

The Level 3 units have been designed to cover those learners who are either:

- Individuals need to acquire Fabricator competencies for the engineering sectors.
- Individuals employed in the Fabricator engineering sectors but require additional competencies as part of an existing job role or to enable career progression.

There are no formal entry requirements for this qualification. Learners must have been initially assessed to ensure they have both the potential and opportunity to achieve the assessment criteria set out in the qualification units and gain evidence from the workplace.

If the qualification is used to support implementation and delivery of an apprenticeship standard, the formal entry requirements will be listed within the standard assessment plan.

Learners are required to obtain evidence against each assessment criteria when competence has been proven.

Performance, Skills and Knowledge evidence must be sufficiently covered and recorded in the Evidence Reference boxes contained within the units, to ensure all criteria has been met.

5.3 Assessors

Assessment must be carried out by competent assessors who, as a minimum, must hold the Level 3 Award in Assessing Competence in the Work Environment. Current and operational assessors that hold units D32 and/or D33 or A1 and/or A2 as appropriate to the assessment being carried out, will not be required to achieve the Level 3 Award as they are still appropriate for the assessment requirements set out in this Unit Assessment Strategy. However, they will be expected to regularly review their skills, knowledge and understanding and where applicable undertake continuing professional development to ensure that they are carrying out workplace assessment to the most up to date Employer Units of Competence (EUC).

Assessor technical requirements

Assessors must be able to demonstrate that they have verifiable, relevant and sufficient technical competence to evaluate and judge performance and knowledge evidence requirements as set out in the relevant outcomes in the Employer Units of Competence.

This will be demonstrated either by holding a relevant technical qualification or by proven industrial experience of the technical areas to be assessed. The assessor's competence must, at the very least, be at the same level as that required of the Apprentice in the units being assessed.

Assessors must also be:

Be fully conversant with the Awarding Organisation's assessment recording documentation used for the Employer Units of Competence, against which the assessments and verification are to be carried out, plus any other relevant documentation and system and procedures to support the QA process.

5.4 Internal Quality Assurers

Internal quality assurance (IQA) must be carried out by competent IQA's that as a minimum must hold the Level 4 Award in the Internal Quality Assurance of Assessment Processes and Practices. Current and operational IQA that hold internal verification units V1 or D34 will not be required to achieve the Level 4 Award as they are still appropriate for the verification requirements set out in this Unit Assessment Strategy.

Internal quality assurers will be expected to regularly review their skills, knowledge and understanding and where applicable undertake continuing professional development to ensure that they are carrying out workplace Quality Assurance (verification) of Assessment Processes and Practices to the most up to date Employer Units of Competence.

Internal quality assurers will also be expected to be fully conversant with the terminology used in the Employer Units of Competence against which the assessments and verification are to be carried out, the appropriate Regulatory Body's systems and procedures and the relevant Awarding Organisation's documentation, systems and procedures within which the assessment and verification is taking place.

Specific technical requirements for persons undertaking the role of external quality assurance

Internal and external quality assurers for the Employer Units of Competence must be able to demonstrate that have verifiable, sufficient and relevant industrial experience, and must have a working knowledge of the processes, techniques and procedures that are used in the engineering industry.

The following tables show the recommended levels of technical competence for assessors, internal and external quality assurers.

Technical requirements for Assessors and Quality Assurers

| Position | Prime activity requirements | Support activity requirements | Technical requirements (see notes) |
|----------------------------------|-----------------------------|------------------------------------|---|
| Assessor | Assessment skills | Internal Quality Assurance Systems | Technical competence in the areas covered by the units being assessed |
| Internal Quality Assurance (IQA) | Quality Assurance skills | Assessment knowledge | Technical understanding of the areas covered by the qualification |
| External Quality Assurance (EQA) | Quality Assurance skills | Assessment understanding | Technical awareness of the areas covered by the qualification |

Notes

1. Technical competence is defined here as a combination of practical skills, knowledge, and the ability to apply both, in familiar and new situations, within a real working environment.
2. Technical understanding is defined here as having a good understanding of the technical activities being assessed, together with knowledge of relevant Health & Safety implications and requirements of the assessments.
3. Technical awareness is defined here as a general overview of the subject area, sufficient to ensure that assessment and evidence are reliable, and that relevant Health and Safety requirements have been complied with.
4. The competence required by the assessor, internal verifier, and external verifier, in the occupational area being assessed, is likely to exist at three levels as indicated by the shaded zones in the following table.

| Technical competence / Job role: | An ability to discuss the general principles of the competences being assessed | An ability to describe the practical aspects of the competences being assessed | An ability to demonstrate the practical competences being assessed |
|----------------------------------|---|---|---|
| Assessor | | | |
| Internal quality assurance | | | |
| External quality assurance | | | |

6.0 Assessment

6.1 Assessment Environment

Assessment of all learners in the Fabricator engineering related occupations, against the Employer Units of Competence (EUC) developed by the employers in the engineering sector, will be undertaken in accordance with the following criteria: -

- Evidence of occupational competence should be generated and collected through real work activities in a real working environment.
- Real work activities are those undertaken to provide a secure product or service under typical business conditions.
- A real working environment is one that reflects typical employment conditions relevant to the work activities being assessed.
- The evidence collected under these conditions should also be as naturally occurring as possible.

Taking account of the above, it is not acceptable to undertake assessments in a classroom, or similar environment that has been set up specifically for training. Where opportunities for evidence collection are not available at the workplace, simulation is permitted, in accordance with the criteria listed in section 6.3 below.

6.2 Access to Assessment

16 is the minimum age limit required by learners to undertake the units unless this is a legal requirement of the process or the environment. Assessment is open to any learner who has the potential to achieve the criteria set out in the units.

When used as part of an apprenticeship standard apprentices must have achieved the requirements of the foundation phase of the apprenticeship in line with the apprenticeship standard they are working towards.

Aids or appliances, which are designed to alleviate disability, may be used during assessment, providing they do not compromise the standard required.

6.3 Carrying Out Assessment

The EAL Level 3 Diploma in Advanced Manufacturing Engineering – Fabricator (Development Competence) units have been specifically developed to cover a wide range of activities.

The evidence produced for the units will, therefore, depend on the learner's choice of "bulleted items" listed in the unit performance criteria. Where the performance criteria gives a choice of bulleted items (for example '**any three from five**'), assessors should note that learners do not need to provide evidence of the other items to complete the unit (in this example above, two items) particularly where these additional items may relate to other activities or methods that are not part of the learners' normal workplace activity or area of expertise.

Performance evidence must be:

- Products of the learners' work, such as items that have been produced or worked on, plans, charts, reports, standard operating procedures, documents produced as part of a work activity, records, or photographs of the completed activity.

Together with:

- Evidence of the way the learners carried out the activities, such as witness testimonies, assessor observations or authenticated learner reports of the activity undertaken.

Competence performance is more than just carrying out a series of individual set tasks. Many of the units contain statements that require the learner to provide evidence that proves they are capable of combining various features and techniques. Where this is the case, separate fragments of evidence would not provide this combination of features and techniques and, therefore, will not be acceptable as demonstrating competent performance.

Simulation

Direct evidence produced through normal performance in the workplace is the primary source for meeting the evidence requirements of this qualification.

If the learner cannot meet all assessment criteria under naturally occurring activities in their workplace and need to simulate a specific task, please refer to the guidance notes "Centre Guidance for Developing Assessments for Simulation/Replication" in smarter touch.

Assessing knowledge and understanding

Knowledge and understanding are key components of competent performance, but it is unlikely that performance evidence alone will provide enough evidence in this area. Where the learner's knowledge and understanding (and the handling of contingency situations) is not apparent from performance evidence, it must be assessed by other means and be supported by suitable evidence.

EAL expects oral questioning and practical demonstrations to be used, as these are considered the most appropriate for these units. Assessors should ask enough questions to make sure that the learner has an appropriate level of knowledge and understanding, as required by the unit. EAL may choose other methods, which must be supported by a suitable rationale.

The achievement of the specific knowledge and understanding requirements of the units cannot simply be inferred by the results of tests or assignments from other units, qualifications, or training programmes. Where evidence is submitted from these sources, the assessor must, as with any assessment, make sure the evidence is valid, reliable, authentic, directly attributable to the learner, and meets the full knowledge and understanding requirements of the unit.

Where oral questioning is used the assessor must retain a record of the questions asked, together with the learner's answers.

Please note: Knowledge and understanding can be demonstrated in a number of different ways.

Witness testimony

Where 'observation' is used to obtain performance evidence, this must be carried out against the unit assessment criteria. Best practice would require that such observation is carried out by a qualified assessor. If this is not practicable, then alternative sources of evidence may be used.

For example, the observation may be carried out against the assessment criteria by someone else that is in close contact with the learner. This could be a team leader, supervisor, mentor or line manager who may be regarded as a suitable witness to the learner's competency. However, the witness must be technically competent in the process or skills that they are providing testimony for, to at least the same level of expertise as that required of the apprentice. It will be the responsibility of the assessor to make sure that any witness testimonies accepted as evidence of the learner's competency are reliable, auditable and technically valid.

7.0 Quality Control of Assessments

General

There are two major points where EAL interacts with the Centre in relation to the external quality control of assessment for a qualification and these are:

- Approval - when a Centre take on new qualifications, EAL, normally through an external verifier ensures that the Centre is suitably equipped and prepared to deliver the new qualification.
- Monitoring - throughout the ongoing delivery of the qualification EAL, through external verification monitoring and other mechanisms must maintain and the quality and consistency of assessment of the qualification.

Approval

In granting approval, EAL, normally through its external verifiers must ensure that the prospective Centre:

- Meets any procedural requirements specified by EAL
- Has sufficient and appropriate physical and staff resources
- Meets relevant health and safety and/or equality and access requirements
- Has a robust plan for the delivery, assessment and quality assurance for the qualification/units.

EAL may decide to visit a Centre to view evidence or may undertake this via other means and there must be a clear rationale for the method(s) deployed.

Monitoring

EAL, through external monitoring and other mechanisms will ensure:

- That a strategy is developed and deployed for the ongoing EAL monitoring of the Centre. This strategy must be based on an active risk assessment of the Centre. In particular, the strategy must identify the apprentice, assessor, and internal verifier sampling strategy to be deployed and the rationale behind this.
- That the Centre's internal quality assurance processes are effective in assessment,
- That sanctions are applied to a Centre where necessary and that corrective actions are taken by the Centre and monitored by the EAL external quality assurer (EQA),
- That reviews of EAL's external auditing arrangements are undertaken.



Part of the
Enginuity Group

Appendix 1: Unit Summaries

All AUCE3 unit summaries are available in the Qualification Specification AUCE3 unit summaries document. For more information, please visit the [EAL Qualification Website](#)



Appendix 2: Learner Registration and Certification

Learners must be registered with EAL on a code which relates to the qualification, this must be completed prior to assessment. Both learner registration and certification can be completed online at the [EAL website](#). For paper-based registration and certification use the appropriate forms. These are located on the EAL Website, for guidance on registration and certification please refer to the Registration and Certification User Guide. To register the learner on the chosen qualification/pathway code:

| Qualification Title: | Code: |
|---|--------------|
| Level 3 Diploma in Advanced Manufacturing and Engineering – Fabricator (Development Competence) | 603/2621/9 |



Part of the
Enginuity Group



Part of the
Enginuity Group

Published by:

EAL
Unit 2, The Orient Centre
Greycaine Road
Watford
Herts
WD24 7GP

© Excellence Achievement Learning Ltd 2022

EAL has made every effort to ensure that the information contained within this publication is accurate at the time of going to print. However, EAL products and services are subject to continuous development and improvement and the right is reserved to change products and services from time to time.

This manual has been prepared as a downloadable resource. It may be freely printed without further permission from EAL on the condition that it is used solely within the purchasing organisation and is not offered for sale in any format.