

# Qualification Manual

EAL Level 3 Diploma in Casting Technology  
(QCF)

QUALIFICATION CODE: 600/1025/3

ISSUE: 2

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# 1.0 About EAL

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Since 1964, **EAL (EMTA Awards Limited)** has been awarding superior vocational qualifications and apprenticeship components for engineering, building services and related sectors.

Developed to the highest technical standard, our qualifications are regularly updated to reflect regulatory and technical changes. We support the providers of our qualifications with an unparalleled level of service to ensure that learners are well prepared for the roles they plan to take on.

EAL recognise the value of skills in the work environment as one of the 5 key drivers of productivity; essential for economic growth and bringing a number of wider social benefits. Through its programme of continuous improvement EAL strives to meet the demand from employers for high performing, high quality products.

For further information please contact EAL Customer Services +44(0)870 240 6889 or visit [www.eal.org.uk](http://www.eal.org.uk).

## 2.0 Introduction to the Qualification

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### What is this qualification?

This qualification focuses on practical skills and knowledge. This ensures that when the learner completes the qualification they will have gained practical experience and some expectation of some of the situations that they could face in a job role within the castings sector. It covers the advanced level knowledge and understanding of a broad range of foundry competencies and has been developed in consultation with the metal castings industry to ensure that it meets the needs of the cast metals sector. This diploma does not require occupational evidence. The EAL Centre Operations Manual **must** be adhered to in the delivery of this qualification.

### Who is this qualification for?

- Learners who may have a limited prior knowledge and understanding of the metal casting sector but have the ability to achieve an advanced level engineering qualification
- Those who wish to become a casting/foundry/quality technician or foundry engineer (e.g. moulder/coremaker, sand technician, caster, casting engineer, methods engineer etc.)
- Those who are new to the cast metals industry or looking for a career change and wish to learn new skills.

### What does this qualification cover?

The knowledge and understanding required by someone working in the casting / foundry industry. The qualification covers a wide range of subjects including health and safety, sand mould and coremaking, investment casting, die casting, preparing and casting metal, casting design and casting quality. [See section 3.0 for further details.](#)

## 2.1 Accreditation & Industry Support for this Qualification

This qualification:

- Is accredited by Ofqual at level three.
- Is a Technical Certificate within the Semta Engineering Manufacture Advanced Apprenticeship Framework

## 2.2 Achievement of the Qualification & ‘Stand Alone Units’

This qualification is achieved when all the necessary units have been achieved. The centre will then be able to apply for the learner’s Diploma. The learner will also receive a Certificate of Unit Credit, listing all the units they have achieved.

However if they don’t manage to complete the full qualification learners can still claim a Certificate of Unit Credit for the units achieved therefore, they still have proof of their ability and could complete the qualification at a later date.

Units can also be taken individually (stand alone). 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.

## 2.3 Relation to Other Qualifications

This qualification relates to:

- EAL Qualifications in Key Skills, Functional Skills and Essential Skills Wales,
- EAL Level 3 NVQ Extended Diploma in Materials Processing and Finishing (QCF)
- EAL L3 Diploma in Engineering Technology (QCF)
- EAL Level 2 Certificate in Metals Industries Processes (QCF)

Details on these can be obtained from the EAL Website or alternatively contact:

- ☐ EAL Customer Services
- ☐ Tel: +44 (0)870 240 6889
- ☐ Email: [customercare@eal.org.uk](mailto:customercare@eal.org.uk)

## 2.4 Qualification Support Materials

The following materials are available for this qualification:

- **Qualification Units:**  
These documents contain the knowledge and/or the practical assessment criteria. They also contain delivery advice, and all the centre assessment material (internal assessments). Where a unit has an externally set exam, this will be indicated on the unit. The units also clearly identify the:
  - [QCF level & Credit value](#)
  - Guided learning hours (GLH)
  - Title, Unit purpose/aims
  - Summary of learning outcomes.
- **Learner packs:**  
These are designed to assist the delivery staff in administration of the internal assessments.

EAL have also provided for centres:

- EAL Centre Operations Manuals - This sets out the requirements for EAL Centres, contains all necessary documentation and also contains helpful teaching and delivery advice. The EAL Centre Operations Manual **must** be adhered to in the delivery of this qualification.

All these materials can be accessed from the EAL Website [www.eal.org.uk](http://www.eal.org.uk). Note: Further delivery support materials will be available in the future for this qualification.

## 2.5 Funding for this Qualification

The following bodies will be able to assist you with your funding queries.

### For England:

- Skills Funding Agency.  
<http://skillsfundingagency.bis.gov.uk/>  
Cheylesmore House  
Quinton Road  
Coventry  
CV1 2WT
- Also, search the Learning Aims Database (LAD) for the qualification code given on the front page of this Manual; this will give an indication of the funding status.

### For Wales:

- Welsh Assembly Government  
<http://wales.gov.uk/topics/educationandskills/?lang=en>  
Cathays Park  
Cardiff  
CF10 3NQ

### For Northern Ireland:

- Department for Employment and Learning  
<http://www.delni.gov.uk/>  
Adelaide House  
39-49 Adelaide Street  
Belfast  
BT2 8FD

### For all Nations and further guidance:

- Semta  
[www.semta.org.uk](http://www.semta.org.uk)  
14 Upton Road  
Watford  
WD18 0JT  
Tel: 01923 238441

## 2.6 Employer Training Resource for this Qualification

If you are an employer and you require details of training for this qualification contact the Institute of Cast Metals Engineers, which exists to provide the metal casting sector with the training and professional development opportunities it needs to stay world-class.

Learn more about the Institute of Cast Metals Engineers training products and services by clicking onto: [www.icme.org.uk](http://www.icme.org.uk)

## 3.0 Rule of Combination (Qualification Structure)

This qualification will be achieved when the learner has successfully completed the common mandatory units followed by the required number of optional units.

### **Mandatory Units: *All units must be completed:***

EAL Code	Unit Title	Level	Credit	Guided Learning Hours	Ofqual Code
QETA/001	<input type="checkbox"/> Engineering and Environmental Health and Safety	3	9	75	T/602/0551
QETA/002	<input type="checkbox"/> Engineering Organisational Efficiency and Improvement	3	9	75	J/602/0554
QETA/064	<input type="checkbox"/> Consumable Mould Casting Processes	3	10	75	J/502/9017
QETA/065	<input type="checkbox"/> Permanent Mould Casting Processes	3	10	75	A/502/9029

### **Optional Units: *Select four of the following units:***

QETA/066	<input type="checkbox"/> Design for Casting	3	10	75	H/502/9056
QETA/067	<input type="checkbox"/> Patternmaking	3	10	75	D/502/9069
QETA/068	<input type="checkbox"/> Sand Moulding and Core Making	3	10	75	F/502/9078
QETA/069	<input type="checkbox"/> Processing and Casting of Molten Metal	3	10	75	M/502/9089
QETA/070	<input type="checkbox"/> Post Cast Operations	3	10	75	F/502/9095
QETA/071	<input type="checkbox"/> Metallurgical Testing	3	10	75	Y/502/9104
QETA/003	<input type="checkbox"/> Advanced Mathematics (for those wishing to enter HE)	3	10	75	R/602/0556
QETA/005	<input type="checkbox"/> Advanced Engineering Science (for those wishing to enter HE)	3	10	75	D/602/0558

## 4.0 Centre & Qualification Approval

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

Note: For centres that already have the NQF qualification on their centre remit they will automatically have approval to run this QCF qualification.

### **For *existing* EAL Centres to put the qualification on your centre remit:**

- The approval form can be downloaded from the centre area of the EAL Website or alternatively obtained from the EAL Centre Operations Manual. Please contact you EV, or EAL Customer Services (see below) if you need any assistance.

### **For *non* EAL Centres to gain centre approval to run the qualification:**

- Please contact the EAL Customer Services Department who will be delighted to hear from you:  
Tel: +44 (0)870 240 6889  
Fax: +44 (0)870 240 6890  
Email: [customercare@eal.org.uk](mailto:customercare@eal.org.uk)



# 5.0 Profiles & Requirements

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The EAL Centre Operations Manual **must** be followed along with this section.

## 5.1 Teaching Staff

The Diploma in Castings Technology must be closely related to industrial practice, and it is essential for teaching staff to having continuing contact with the casting industry. Teaching staff must show:

- Teaching ability – evidence of training in lecturing, public speaking or verbal communication.
- Knowledge and understanding of the occupations covered by the qualification
- Knowledge and understanding of the structure and content of this qualification
- Appropriate industrial experience

### Teaching staff must also:

- Be working towards an appropriate teaching/training qualification (e.g. Cert Ed or Learning & Development trainer units)  
**or**
- Hold an appropriate teaching/training qualification (e.g. Cert Ed or Learning & Development trainer units)

Must also have:

- Knowledge and understanding of the structure and content of this qualification.

## 5.2 Assessors

### Assessors must:

- Have 2 years experience in assessment (e.g. within an N/SVQ or teaching/training environment)  
**or**  
be working towards an appropriate assessment qualification (e.g. A1/A2)  
**or**  
hold an appropriate assessment qualification (e.g. A1/A2)
- Have appropriate industrial experience and possess knowledge and understanding of the occupations covered by the qualification
- Have knowledge and understanding of the structure and content of this qualification.

## 5.3 Quality Assurance Staff

### Quality assurance staff must:

- Have experience in quality management/internal verification  
**or**  
hold an appropriate qualification (e.g. V1)
- Have familiarity of the occupation covered by the qualification
- Have knowledge and understanding of the qualification's structure and content.

## 5.4 Personnel Conducting the External Assessment

### These personnel must:

- Have experience in conducting and controlling exam sessions  
*or*  
be supervised, conducting this function, by an individual experienced in conducting and controlling exam sessions
- Have knowledge, understanding and compliance to EAL examination procedures (see the EAL Centre Operations Manual)

## 5.5 Learners

There are no formal entry requirements for this qualification; although Centres should ensure that the learners have the potential to achieve the units selected within this qualification. Learners must have the minimum levels of literacy and numeracy to comply with the health and safety aspects of the scheme, the completion of the learning outcomes and the external assessment.

Centres should make candidates with particular requirements aware of the practical and theory content of the qualification and they should be given every opportunity to complete all or some of the units. EAL will consider any reasonable suggestions for and from, those with disabilities that would help them to achieve the learning outcomes without compromising the standards required.

### Age Restrictions

There are no age restrictions.

## 5.6 Physical Resources

The resources required for the assessments are detailed in each of the qualification units.

## 6.0 Assessment

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The assessment of this qualification has two aspects – internal (centre marked) assessments and an external (EAL marked) exam. The learner must pass all the internal assessments and the external assessment of their chosen units to achieve the qualification. EAL will monitor and externally verify both forms of assessment. The two common mandatory units will be only subject to external assessment (see below). The remaining units will only be subject to internal assessment. The EAL Centre Operations Manual **must** be followed along with this section.

### 6.1 External (EAL Marked) Assessment

This is an on-screen examination, which assesses the knowledge and understanding relevant to the two common mandatory units as follows:

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QETA/001	<input type="checkbox"/>	Engineering and Environmental Health and Safety
QETA/002	<input type="checkbox"/>	Engineering Organisational Efficiency and Improvement

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Exam Specification		
Number of questions: 40 Time allowed: 60 mins Pass mark: 60% (not graded)		
LO °	LO Title	N° of Questions/sub groups covering each learning outcome
1.1	Understand Health and Safety Roles and Responsibilities	6
1.2	Understand the Application of Health & Safety in the Engineering Environment	5
1.3	Understand the Safe Moving and Storing of Materials	5
1.4	Understand Environmental Management	5
2.1	Understand Production Activities	5
2.2	Understand Application of Quality Control and Quality Assurance	6
2.3	Understand Organisational Improvement Techniques and Competitiveness	5
2.4	Understand Personnel Rights and Responsibilities within an Organisation	3

**Key Points:**

- Learners must be registered for the external assessment component with EAL a specified number of days before the test date to allow for printing and dispatch of papers (refer to the EAL Procedures for Conducting an External Assessment).
- The examination must be undertaken by the learner under controlled conditions as specified by in EAL's procedures for External Assessment contained within the Centre Operations Manual.
- This exam is available on demand and result release will be within in 24 hours.
- The external assessment must be delivered and invigilated by the centre in line with EAL's external assessment procedures.
- EAL's Centre Co-ordinator will assume responsibility for liaison and correspondence regarding the external assessment component.
- Centres will be sampled by EAL to ensure the tests are delivered in accordance with EAL instructions.

## **6.2 Internal (Centre Marked) Assessment**

Internal assessments test the practical skills and knowledge of the learners within the units and to a very limited extent within the common mandatory units. They are centre marked by members of the delivery team.

Internal assessment involves collecting and evaluating evidence that demonstrates achievement of the learning outcomes. This will be subject to external verification. Centres are responsible for ensuring that assessment decisions are valid and reliable

### **Units QETA/064 - 71**

Where the assessments for this qualification are delivered by using a distance learning methodology then the internal written/short answer and multiple choice question papers should be uploaded to centres VLE. The centre should inform the EV if this method of assessment is adopted. It is acceptable for the internal assessments to be treated as 'open book' and learners may complete the assessments independently of the centre. It remains the responsibility of the centre to ensure that all assessments completed and submitted by learners are valid and can be attributed to the learner.

### **Units QETA/003 & 005**

The assessments in these units are not suitable for inclusion in a VLE and take the form of written/short answer and multiple choice question papers, these should be treated as formal assessments therefore imposing the necessary restrictions on the learner e.g. invigilation, no conferring or referring to text books etc.

Guidance sheets have been created to hand out to the learners, to ensure they are aware how to complete the multiple choice and short answer questions papers and how to amend their answers if necessary.

The internal assessments are accompanied by marking criteria, checklists and other assessment material to ensure that the delivery team is consistent amongst learners with assessments. The internal assessments and the accompanying marking/assessment criteria can be found in the individual units.

It is advised that the learner's produce a logbook/portfolio where they can file and make reference to evidence that shows their achievements against the learning outcomes.

All learning outcomes of the qualification must be assessed. In order to meet this requirement it is advised that centres should maintain an assessment and feedback record for each learner. This will

detail the evidence evaluated against the learning outcome and the feedback given to the learner. These records along with the learner logbooks must be available to the EAL External Verifier.

# Appendix 1: Qualification & Credit Framework (QCF)

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This is the framework for creating and accrediting qualifications in England, Wales and Northern Ireland. Assessment routes within this qualification have a level and credit. The level is indicative of the challenge. The credit value specifies the number of credits that will be awarded to a learner who successfully achieves the assessment route. One credit is equal to 10 hours of learning time. Learning time is defined as the total time taken by the average learner at this level to fully complete the learning outcomes and assessment requirements of a unit. This includes the guided learning hours (GLH) in the classroom/workshop as well as any direct study, homework, practice, preparation and assessment.

## QCF Requirements for Centres

The QCF has requirements for centres in relation to the information provided to the relevant funding bodies. Centres will need to:

- Register the centre with the UK Register of Learning Providers (UKRLP) to obtain a UK Provider Reference Number (UKPRN)
- Become a Learner Registering Body (LRB). This will ensure that every individual 'centre reference number' or UKPRN will be identifiable on one system which is the UKRLP.
- Obtain or confirm Unique Learner Numbers (ULNs) for Learners through the Learner Registration Service (LRS).

The ULN will be issued from and held on the Learner Registration Service (LRS). This number will enable credit accumulation and transfer of learner achievement, and will create a Learner Record. The use of the ULN is mandated by government funding bodies. The ULN may not be applicable for all learners, for example if the learner is not a UK national. The ULN relates to England, Wales and Northern Ireland only. Scotland has a similar number, the Scottish Candidate Number (SCN).

Further details of the ULN and LRS can be obtained from the Learner Records Service.

If you have any further queries or concerns please visit the EAL Website [www.eal.org.uk](http://www.eal.org.uk). or contact our Customer Services department who can assist you.

# Appendix 2: Functional Skills & Essential Skills Wales

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## Essential Skills Wales (ESW)

Essential skills Wales are a suite of qualifications to replace Key Skills in Wales. There are currently three ESW qualifications:

- Application of number (Aon),
- Communication,
- Information communication technology (ICT).

EAL offer these qualifications at levels one to three. These qualifications are 'stand alone' and are portfolio based; however these can be embedded into other qualifications but must remain a transferable skill.

DCELLS are currently reviewing Working with Others; Improving Ones own Learning and Problem Solving which will become part of a suite of six qualifications along with Application of Number, Communication and Information Communication Technology. These qualifications will available from September 2010. Currently the wider Key Skills are available until September 2012.

For further information essential skills Wales please visit the EAL website

## Functional skills

If individuals don't achieve a level two functionality while at school; they will have other opportunities to do so at college, within an apprenticeship, or in an adult course on day release from work, whatever their age.

Functional Skills qualifications will replace existing Key Skills qualifications.

Functional Skills qualifications will be:

- a constituent of new Diplomas at every level,
- a replacement for Communication, AoN and ICT Key Skills qualifications part of Apprenticeship Frameworks
- part of Foundation Learning.

Each qualification is separate and assessed independently. The qualifications have been designed so that, at level two, learners are able to apply their skills confidently in a range of different contexts.

Functional Skills are already part of the Qualifications and Credit Framework (QCF) and have been allocated a credit value of five at the two Levels.

For further information on functional skills and essential skills Wales and please visit the EAL website at [www.eal.org.uk/](http://www.eal.org.uk/)

# Appendix 3: Potential Sources of Teaching Information

There are a number of books and web sites, which provide useful sources of teaching information to support this qualification.

## Common Mandatory Units

Title	Author	Publisher	ISBN
Engineering Materials: An Introduction to their Properties and Applications	Michael Ashby & David R.H Jones	Butterworth-Heinemann	0750630817

## Web Sites

<http://www.healthandsafety.co.uk>

<http://www.iso.ch>

<http://www.yourrights.org.uk>

## Optional Units

Title	Author	Publisher	ISBN
Introduction to the Cast Metals Industry		AFS Softcover 132 pages	AFS ref: TE7107
Foseco Foundryman's Handbook, 10th Ed		1994, Butterworth Heinemann, 400 pages	ISBN: 978-0-7506-1939-4
Foseco Non-Ferrous Foundryman's Handbook		1999, Butterworth Heinemann. 304 pages	ISBN: 978-0-7506-4286-6
Foseco Ferrous Foundryman's Handbook, 11th Ed	Main Author: John Brown, Foseco International Ltd	2000, Butterworth Heinemann, Paperback, 384 pages	ISBN: 978-0-7506-4284-2
Concise Castings: a casting workshop lecture	John Campbell, Professor Emeritus of Casting Technology at the University of Birmingham, UK	AFS 2010. Paperback, 93 pages	ISBN: 978-0087433-363-3
Complete Casting Handbook, 1st edition	John Campbell Professor Emeritus of Casting Technology at the University of Birmingham, UK	Butterworth- Heinemann; Aug 2001, Hardcover: 1220 pages	ISBN-10: 1856178099 ISBN-13: 978-1856178099
ASM Handbook Vol. 15: Casting		ASM, 1998. 937 pages	ISBN: 978-0-87170-021-2
Metallurgy for the Non-Metallurgist		ASM, 1998; 284 Pages; Hard Cover	ISBN: 0-87170-652-0
Basic Principles of Metallurgy, Vol. 1		AFS	AFS ref TE6900
Basic Principles of Metallurgy, Vol. 2		AFS	AFS ref TE7000



# Appendix 4: Relation to National Occupational Standards

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EAL's QETA & QETP Units are mapped to national occupational standards as shown:

<b>EAL Code</b>	<b>Details of the relationship between the unit and relevant national occupational standards or other professional standards or curricula</b>
QETA/001	O45NMME2.01
QETA/002	O45NMME2.01
QETA/064	SEMMP A14
QETA/065	SEMMP A14
QETA/066	SEMMP A14
QETA/067	SEMPAT A14
QETA/068	SEMMP A9
QETA/069	SEMMP A12
QETA/070	SEMMP A14
QETA/071	SEMMP A61

# Appendix 5: Learner Registration & Certification

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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 on line at the EAL Website [www.eal.org.uk](http://www.eal.org.uk). For paper based registration and certification use forms CRF1, and CRF1A. These are located in the centre operations manual.

## To Register the Learner on the Chosen Qualification/Pathway Code:

Qualification Title	Code
EAL Level 3 Diploma in Casting Technology (QCF)	600/1025/3

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