

**Assessment Plan
for
Food and Drink Engineering
Mechanical Maintenance Engineer and
Multi-skilled Maintenance Engineer**

Section 1

1.1 Introduction

This Assessment Plan sets out the requirements for the Food and Drink Engineering Maintenance (FDEM) Apprenticeship Standard for two roles; Mechanical Maintenance Engineer and Multi-skilled Maintenance Engineer. It has been endorsed by the FDEM Trailblazer employer Steering Group.

This plan sets out the overall approach to assessment for Apprentices on the Standard. For the first time the Standard combines the unique blend of engineering maintenance skills and knowledge, with food safety, compliance and food processing skills and knowledge, required by the industry. Apprentices completing this Standard will be ready to progress to a range of engineering roles in the food and drink sector, or to higher education (eg BSc or MSc in Food Engineering).

The plan provides initial information for Awarding Organisations and centres that will deliver the Apprenticeship Standard.

The plan sets out

- the assessment methodology and details of evidence requirements for the different components of the Standard
- details of recognition from the Professional Engineering bodies

Further supporting assessment documentation referenced in this plan, will be made available in due course and published alongside the Food and Drink Engineering Maintenance Standard and Assessment Plan.

1.2 Scope

This assessment plan applies to the following occupations.

Food and Drink Engineering Mechanical Maintenance Engineer
Food and Drink Engineering Multi-Skilled Maintenance Engineer

The Standard is for use in England only.

Section 2

2.1 Evidence requirements

The Apprenticeship programme is designed to prepare apprentices to be 'work ready' for a food and drink engineering environment. They will develop skills and knowledge in food safety, health and safety, hygiene, compliance and processing. In addition they will develop engineering maintenance skills, knowledge and behaviours that they can apply to the unique requirements of the sector.

Apprentices will be required to provide the following evidence as proof of completion and to claim the final Apprenticeship Certificate.

- Level 3 Diploma for FDEM (or equivalent) Certificate
- Completed Food Technology assignment work book
- Completed record of Assessment of Behaviours
- Achievement of the synopic knowledge and skills tests.

All of the components required above will be graded Pass/Merit/Distinction.

Duration

It is expected that the Apprenticeship programme will take between 3 and 4 years to complete.

Section 3

3.1 Independence of Assessment in the Apprenticeship Programme

The FDEM Steering Group believe that it is best practice to include engineering qualifications in the programme that combine the sector's unique requirements for engineering and food technology skills. New qualifications, such as the Level 3 Diploma for FDEM ensure independence of assessment. They will combine assessment of both engineering skills and knowledge in a food manufacturing environment and off the job. This allows for cost effective assessment.

The learning outcomes for Food Safety are included in the food technology component of the apprenticeship programme. The Steering Group believe it is best practice for employers to offer apprentices the opportunity to gain a Level 2 Award in Food Safety for Manufacturing qualification as part of their programme.

Awarding bodies are responsible for external quality assurance of regulated accredited qualifications. Their established quality assurance systems ensure an impartial and independent confirmation of the apprentice's qualification achievements.

Section 4

4.1 Assessment environment and evidence requirements

The key principle for the new Standard is that evidence presented by apprentices must demonstrate that they are competent to work in the food and drink engineering sector.

Evidence must therefore reflect this, and should be derived from a food and drink engineering maintenance workplace whenever possible.

The Level 3 Diploma for FDEM qualification has been designed to assess both workplace competence and the knowledge required to underpin this.

4.2 Performance evidence

Performance evidence will be the main form of evidence used to assess the competence of apprentices in the workplace.

The qualification specification sets out the assessment methods that may be used to produce sufficient evidence to demonstrate competence. This will include

- observation of the apprentice carrying out their role the workplace by an assessor
- products of the apprentice's work
- workplace or witness testimony
- documentary evidence such as photographs of work, completed maintenance reports and records, minutes of meetings

Awarding Organisations will provide further guidance about assessment methods, prior to the qualifications becoming operational.

The competence units within this qualification **must** be assessed in the apprentice's workplace, and evidence must be derived from the activities that they undertake as part of their normal food and drink engineering maintenance role.

The only exceptions to the requirements for demonstrating competence in the workplace will be to allow a minimum amount of evidence to be derived from simulation of activities which may cover

- dealing with emergency situations (ie fire procedures, or accidents)
- work activities which do not arise regularly in the workplace (ie dealing with one-off new installations, resolving problems with colleagues at work)

Use of simulated evidence must be approved in advance by the Awarding Organisation. As far as practicable it must mirror real occurrences of the activity in the workplace.

4.3 Evidence of knowledge and understanding

The knowledge units may be assessed on or off the job as set out in the qualification specification.

It is expected that the occupational knowledge underpinning competent performance in the workplace will be assessed by oral questioning during or after observations by the assessor.

In addition, apprentices are required to complete written assignments/tests for some of the knowledge units in the qualification.

Apprentices are also required to complete Food Technology assignment workbooks to demonstrate their knowledge of food processing.

4.4 Evidence of Behaviours

Apprentices are required to complete a record/journal/portfolio of evidence to demonstrate that they have met the criteria for behaviours set out as part of the Standard.

Centres will provide guidance on how apprentices should best approach their record/journal/portfolio of evidence. This document must show how the apprentice demonstrates the behaviours and applies them during their food and drink engineering maintenance activities.

Section 5

5.1 Independent Assessment Organisation (IAO) and Governance

The FDEM Steering Group are considering employer led approaches for quality assurance and governance, and are working through the options for this with BIS. At the moment awarding organisations who wish to deliver against the standard will need to be on the SFA register of assessment organisations.

Section 6

6.1 Registration with Professional bodies and Engineering Technician status.

Some apprentices may wish to apply for EngTech membership of a professional body on completion of their programme. It is not mandatory for apprentices to work to the EngTech requirements when they complete their apprenticeship, however, it is recognised that many apprentices will wish to join a Professional Body.

The Standard has been endorsed by the Institute of Engineering and Technology (IET) and Institute of Mechanical Engineers (IMEchE).

Apprentices planning to apply to join either of these bodies are advised to refer to the EngTech joining criteria from each body which will explain how evidence gained from the apprenticeship programme will meet EngTech membership criteria.

Annex

Apprenticeship Standard for Food and Drink Maintenance Engineers

Occupations:

Food and Drink Mechanical Maintenance Engineer
Food and Drink Multi-skilled Maintenance Engineer

Programme duration: 3 to 4 years

Food and Drink Maintenance Engineering Role

The Food and Drink industry is an exciting place to be a Maintenance Engineer. World class companies in the industry use some of the most innovative, modern and technically automated equipment available to manufacture a wide range of food and drink products for consumers. Companies employ Mechanical and/or Multi-skilled Maintenance Engineers according to the type of products they make.

Food and Drink Mechanical Maintenance Engineers will mainly work with mechanical and electrical equipment and production systems. Food and Drink Multi-skilled Maintenance Engineers will work with mechanical and electrical equipment plus highly automated programmable control systems.

Both Mechanical and Multi-skilled Engineers need to maximise the benefits of the technology and equipment they work with. Depending on the type of product and plant in the company, engineering activities carried out will include routine maintenance, fault finding and diagnosis, testing and commissioning. They must ensure that maintenance activities contribute to optimising food and drink production levels.

Food and Drink Mechanical and Multi-skilled Engineers must ensure that all maintenance activities are conducted safely, and practices comply with food safety legislation in this highly regulated industry. They must understand the key features of working with consumable products and how they this affects food industry maintenance practices.

Food and Drink Engineers will work autonomously, taking responsibility for their own tasks and also work effectively in teams.

Food and Drink Maintenance Engineer Skills, knowledge and behaviours

At the end of their Apprenticeship, Food and Drink Mechanical Maintenance Engineers and Food and Drink Multi-Skilled Maintenance Engineers will demonstrate core food and drink maintenance technical skills, knowledge and behaviours.

Core Technical Skills

- Perform first line routine mechanical maintenance, including removing and replacing components, cleaning, lubrication, inspection and fault finding
- Apply 'best practice' techniques, eg condition monitoring and proactive maintenance
- Produce replacement components, using manual and machine processes
- Weld stainless steel and other materials used in food production equipment

Core Knowledge

- Food processing/manufacturing and product knowledge (to meet company requirements eg Dairy/Confectionery/Meat processing)
- Understanding of how to comply with regulations, including food safety and HACCP (Hazard Analysis and Critical Control Points)
- The impact of customer requirements and demands on the food supply chain
- Materials science, including the key features of raw materials, their uses in food production and types of equipment used to process them
- Principles of electrical systems, including their uses, safety and legislation
- Services and utilities knowledge, including the importance and impact of energy management and pollution control in food production.

Apprenticeship Standard for Food and Drink Maintenance Engineers

In addition to the core technical skills and knowledge, Food and Drink Multi-skilled Maintenance Engineers, will demonstrate additional technical skills:

Food and Drink Multi-skilled Maintenance Engineer Technical Skills

- Commission and perform maintenance of instrumentation/process control systems
- Perform first line electrical maintenance, including testing, fault finding, repairing and replacing components
- Perform maintenance of programmable control systems.

Core Behaviours

Food and Drink Mechanical and Multi-Skilled Maintenance Engineer Apprentices will demonstrate the following behaviours:

- Safe working: ensures safety of self and others, food safe, challenges safety issues
- Ownership of work: accepts responsibility, is proactive, plans work
- Pride in work: integrity, aims for excellence, time management
- Self-development: links own objectives to support the business, seeks learning and development opportunities
- Integrity and respect: for colleagues, good communication with managers
- Working in a team: builds good relationships with others
- Problem solving: takes responsibility until a solution is reached, challenges others, works to solve root cause of problems
- Responsiveness to change: flexibility to changing environment and demands
- Company/industry perspective: knowledge of company and food industry, acts as an ambassador
- Effective communication: with colleagues/managers, in writing, visually, verbally.

Entry requirements

Individual employers will set the selection criteria for their Apprenticeships. Most candidates will have 4 GCSE's at Grade C or equivalent, including Mathematics, English and a Science. If not set as an entry criterion, apprentices will achieve English and Mathematics at level 2 by the end of the apprenticeship.

Qualification requirements

All apprentices are required to complete a Level 3 Extended Diploma in Food and Drink Engineering Maintenance during their apprenticeship programme. The qualification should be successfully achieved before apprentices complete the independent assessment at the end of their programme.

Final Assessment and grading

Apprentices will be required to complete a synoptic independent assessment test at the end of their programme. The full Apprenticeship Standard will be graded pass, merit or distinction.

Progression and Professional recognition

On completion of this Standard, apprentices may progress to a wide range of employment opportunities, or to Higher Education (eg MEng in Food Engineering).

This Standard has been designed to deliver sufficient Underpinning Knowledge and Understanding (UKU) and allow apprentices sufficient experiential, work based learning opportunities to satisfy the requirements for Professional Registration as Engineering Technician (EngTech) as defined by the UK Standard for Professional Engineering Competence (UK-SPEC).

Level

This Standard is at Level 3 of the Qualifications and Credit Framework (QCF).

Standard Review date

This Standard is due for review in March 2017.

Annex 2

End Point Assessment Summary				
Assessment Component	Assessment method	Standard reference	Weighting	Grading
Food and Food Technology skills and knowledge Written Assessment	Assignment workbooks Completed assignment workbooks. Learning outcomes incorporate the Level 2 Award for Food Safety for Manufacturing and it is best practise for apprentices to gain the Award during their programme. Apprentices may complete either a generic food technology or sector specific (eg dairy) assignment workbook.	Compliance Food Processing Technology	10%	Pass Merit Distinction
Food and Drink sector engineering skills and knowledge Level 3 Qualification	Qualification A new combined qualification assessing competence in the workplace and knowledge. See individual qualification units for details of the assessment methods and requirements for on and off the job assessment.	Engineering technical core skills and knowledge	40%	Pass Merit Distinction
Behaviours Written Assessment	Record of behaviours Apprentices will present a record (eg workbook/journal) confirming they have met the behaviours criteria.	Core behaviours	25%	Pass Merit Distinction
Knowledge and Skills Test	Skills Test Apprentices will complete a test, designed to sample all higher order components of the Standard, including written and online questions and a practical component. This will include an online or oral knowledge test with an assessor, an interview with an independent assessor and a minimum of three observed assessments or practical observations within a twelve week period.	All core skills, knowledge and behaviours	25%	Pass Merit Distinction