

Food and Drink Engineering Maintenance Apprenticeship

Assessment Plan

Food and Drink Engineering Maintenance Apprenticeship

Summary of Apprenticeship

The Food and Drink Engineering Maintenance apprenticeship is an integrated programme of knowledge and skills acquisition, developed alongside core behaviours expected of a competent mechanical maintenance engineer or multi-skilled maintenance engineer working in a food and drink setting. The award of the apprenticeship certificate will signify recognition of competence in the role. Apprentices will typically spend 42-48 months working towards the apprenticeship standard, with the end-point assessment completed in the final twelve weeks. Performance in the end-point assessment will determine the apprenticeship grade of fail, pass, merit or distinction.

There are no pre-requisite entry requirements for this programme. Apprentices without English and Maths at level 2 must then achieve this required level prior to taking their end-point assessment.

Prior to the end-point assessment, apprentices will undertake a structured period of on-programme training to develop the knowledge, skills and behaviours required of the standard. Achievement of a Level 3 Diploma in Food and Drink Engineering Maintenance, which includes grading at pass, merit and distinction, is a pre-requisite to taking the end-point assessment.

It is recommended that the structured period of on-programme training incorporates learning outcomes from the Level 2 Award in Food Safety and the Level 2 Award in Principles of HACCP Based Food Safety Systems. It is best practise for apprentices to gain these Awards during their programme.

Apprentices must undertake a programme of learning on food topics that are documented in the standard, and which are not included in the Level 3 Diploma in Food and Drink Engineering Maintenance, and this knowledge will be tested as part of the end-point assessment.

End-point assessment will be conducted by an independent assessment organisation (IAO). IAOs must be on the Skills Funding Agency's (SFA) Register of Apprentice Assessment Organisations (RoAAO) for this standard.

The end-point assessment will include three distinct components:

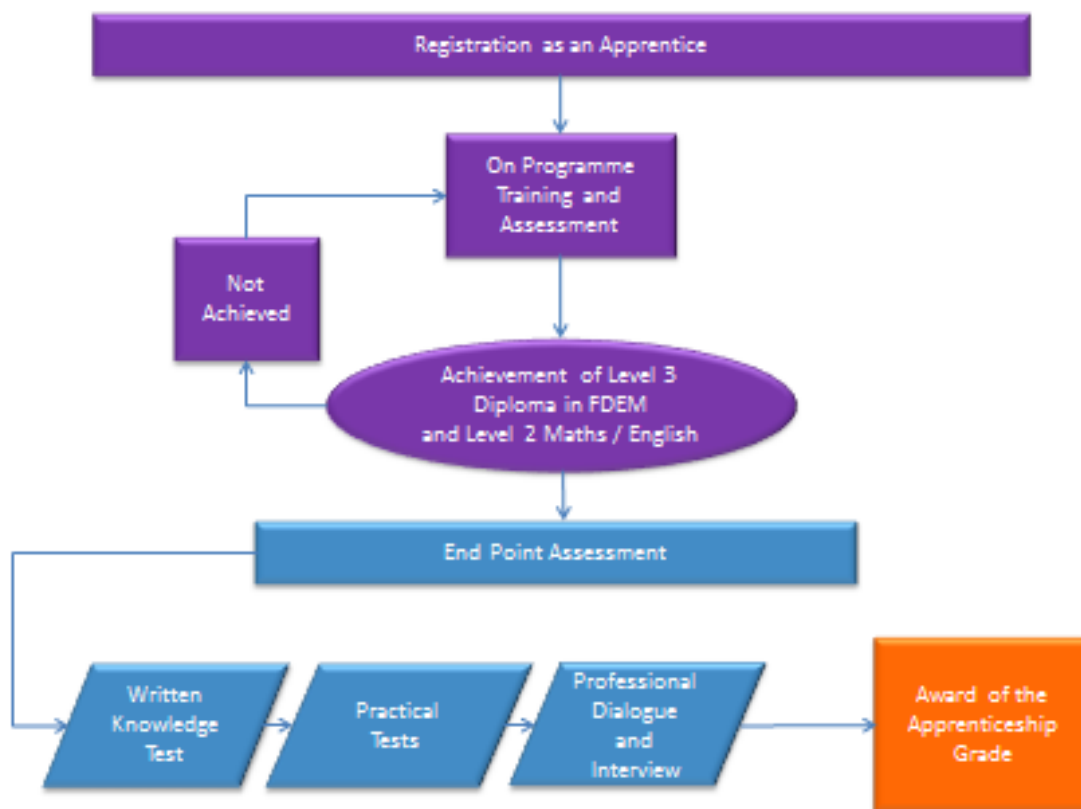
- A **written knowledge test** answered through a combination of multiple choice questions and extended answer questions
- **Practical tests** made up of work-based observations and a work-based and job-related workplace project
- A **professional dialogue and interview**, which is undertaken after all other end-point assessment components have been successfully completed.

To achieve final certification, the apprentice must have completed and achieved a minimum of a pass in each end-point assessment component.

A pass in the end-point assessment will demonstrate that the apprentice can apply the knowledge, skills and behaviours required by the standard and will satisfy the requirements for the award of an

apprenticeship certificate. Apprentices achieving a merit or distinction will be demonstrating performance above the requirements of the standard.

Summary of the Apprenticeship



Apprenticeship Grading and Weighting Overview

End-point Assessment Method	Area Assessed	Assessed by	Grading	Weighting
Written Knowledge Test	<i>All knowledge will be assessed in the written knowledge test. The knowledge test will be drawn from all of the knowledge statements within the standard.</i>	Independent Assessment Organisation	Pass Merit Distinction	25%
Practical Tests	<i>The apprentice will demonstrate their practical knowledge, skills and behaviours through completion of a project and a series of observations. The workplace project is a substantial piece of work that will allow the apprentice to plan, implement and present an individual work-based project. The apprentice will demonstrate a range of competencies appropriate to the workplace setting. The apprentice will also undertake three practical observations of skills, which will assess their competence in maintenance activities.</i>	Independent Assessment Organisation	Pass Merit Distinction	60%
Professional Dialogue and Interview	<i>The professional dialogue and interview is a structured discussion between the apprentice and an independent assessor. A set of standardised competency based questions will be used.</i>	Independent Assessment Organisation	Pass Merit Distinction	15%

The apprentice must achieve a pass as a minimum in every individual end-point assessment component to achieve an overall pass and achieve the apprentice certificate.

End-point Assessment Gateway

Before the apprentice is judged ready to undertake the end-point assessment, they must have completed and achieved a pass as a minimum in the Level 3 Diploma in Food and Drink Engineering Maintenance and Level 2 English and maths.

Judgement on whether the apprentice is ready for the end-point assessment should be by the employer, who may wish to take advice from the learning provider.

End-point Assessment

Written Knowledge Test

The knowledge test should be taken as early as possible in the 12 week period of the end-point assessment. The knowledge test assesses the underpinning knowledge and understanding of the apprentice through multiple choice questions and industry scenarios when working as a Food and Drink Maintenance Engineer, either in a Mechanical or Multi-Skilled role. The questions will be presented in two sections, a core multiple choice question (MCQ) format (30 questions, 1 mark each) and extended answer questions (5 questions, 6 marks each).

The assessment will be undertaken under controlled conditions within a 90 minute time limit (but not necessarily undertaken as an online or computer based test).

Multiple choice questions will be drawn from all knowledge statements. Extended answer questions must be drawn from the knowledge specified below:

- Food processing/manufacturing and product knowledge
- Cleaning and hygiene processes
- Quality management systems and processes
- Continuous improvement
- Materials science
- Fault finding techniques
- Operation of mechanical equipment
- Production of replacement components
- Function of fluid power systems
- Operations of heat exchange equipment
- Principles of cutting and welding
- Principles of electrical systems
- Services and utilities.

The knowledge test will result in a pass, merit or distinction grade and it will contribute 25% to the weighting of the final apprenticeship grade.

The grading threshold will be as set out in the table below:

Acceptable achievement – Pass	Good achievement - Merit	Outstanding achievement - Distinction
>40 marks out of 60	>50 marks out of 60	>55 marks out of 60

Candidates achieving between 25 and 39 correct marks may resit the assessment on one further occasion within three months. It is expected that candidates achieving less than 25 correct marks will need to undertake a period of further learning and will not be allowed to retake the test until after completing a professional review of performance.

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Practical Tests

1. The apprentice will demonstrate their practical knowledge, skills and behaviours through a project which will be undertaken over a twelve-week period as part of the end-point assessment within a food and drink environment.
2. The apprentice will also showcase their knowledge, skills and behaviours to undertake maintenance activities in the food and drink environment through a minimum of three observed assessments during the end-point assessment period.

The combination of a project and observations will cover the practical application of all knowledge, skills and behavioural aspects of the standard, either as a mechanical or multi-skilled maintenance engineer, allowing the assessor to grade occupational competence either in the workplace or in a realistic working environment.

- **Workplace Project**

The workplace project is a substantial piece of work that will allow the apprentice to plan, implement and present an individual work-based project.

A bank of business-related projects will be developed by an IAO for the standard. All of the projects will be comparable in terms of content and complexity; it is the context within which the knowledge, skills and behaviours must be demonstrated that will vary. Employers will select the most appropriate project for each apprentice, based on their current job role, either as a mechanical or multi-skilled maintenance engineer. There should also be an opportunity for employers to propose project opportunities in line with their operations, which will lead to development of agreed project briefs and criteria which will be comparable in terms content and complexity with the standard bank of business-related projects.

The workplace project should be agreed between the employer and independent assessor and undertaken over a 12-week period as part of the end-point assessment. It should be conducted as part of an apprentice's normal work.

Projects will be trialled to ensure they are valid, reliable and comparable to the other projects, before being approved for use. Projects will be monitored over time to ensure comparability and continuing relevance.

The scope of the project must cover, but need not be limited to:

1. Planning, Design and Organisation

Planning and design of project programme of work including recognition of resource implications, risk assessment in line with food safety and other Health & Safety

requirements, and other work-based customer and stakeholder requirements in line with company's business plans.

2. Project Implementation

Competent implementation of project work, including recognition of safe working practices and recording of work and progress. Feedback of own reflection, and feedback from line manager or customer. High academic rigour.

3. Results and Conclusions

Appropriate, timely and concise reporting of project work including data analysis and drawing conclusions via written and oral media. Conclusion should evidence which engineering principles were covered throughout the project. The project should deliver efficient savings.

The apprentice will produce a report of no more than 2,000 words which describes how the project was planned, implemented and the outcome, which is presented to the independent assessor during the final week of the 12 week end-point assessment period.

The presentation will cover:

- Approach, methods, results, data analysis, drawing conclusions and recommendations
- Use of equipment and tools to undertake project work
- Liaison and support from others e.g. line manager, technical experts.

Assessment of the project elements will be as follows:

- The independent assessor will assess the quality of workmanship and output from the project.
- The report must be submitted to the independent assessor one week before the date of the presentation.
- The presentation and Q&A will typically last 45 minutes and no more than one hour.
- Presentations can take place in the workplace under controlled conditions or in assessment centres run by the IAOs. Wherever the presentation is undertaken it must take place in a room, free from distractions.
- The outcomes of the assessment elements will be documented using the IAO's standard documentation.

• **Observations**

The apprentice must undertake a minimum of three observed assessments during the 12-week end-point assessment period to showcase their skills, knowledge and behaviours at undertaking maintenance activities, either as a mechanical or multi-skilled maintenance engineer.

The IAO will develop a series of observations that reflect an everyday scenario from the apprentice's working environment.

Each of the observations will be undertaken within a 60-minute timed period and must be scheduled when the apprentice will be working in their normal place of work or in a simulated environment. They will also:

- Be conducted at a time which reflects typical working conditions
- Allow the apprentice to demonstrate all aspects of the standard being observed
- Take a synoptic approach to observing the overall competence.

The independent assessor will plan the observation in conjunction with the apprentice and employer and use the assessment tools and procedures that are set by the IAO, which will be subject to internal and external quality assurance.

The observations will evidence the apprentice's planned maintenance skills, but at least one of the assessments must involve inducing faults, so that the apprentice can demonstrate their fault finding and reactive maintenance skills.

The practical tests will result in a pass, merit or distinction grade and will contribute 60% to the weighting of the final apprenticeship grade.

The following specifies the grading criteria are to be used for practical tests:

Practical element	Acceptable achievement (1 point per statement)	Commendable Achievement (2 points per statement)	Outstanding Achievement (3 points per statement)
Observations	Apprentice carries out maintenance activities in line with requirements of standard	Apprentice carries out maintenance activities effectively, in a logical and planned sequence, seeking ways to improve performance	Apprentice demonstrates effective improvement on current performance, suggesting improvements to standards or ways of working
Project Output	Project output demonstrates work in line with expected quality and requirements of the standard	Project output demonstrates work above the expected level of quality with demonstrable financial benefits	Project output demonstrates work at an outstanding level of quality with demonstrable financial benefits and efficiency savings which impact upon the business

Report	Report which clearly shows approach to planning, implementation and outcome of project	Report which makes recommendations for improvements and efficiency savings	Well-reasoned conclusions and sound/logical recommendations for future implementation linked to tangible business benefits
Delivery of presentation	Clear, articulate and accurate presentation of technical project elements and personal viewpoints within timescales allowed	Delivers presentation confidently; deals well with technical questioning; demonstrates effective listening skills	Dynamic and engaging presentation; adapts style to fully capture the attention of the audience using an appropriate selection and variation of presentation skills

Each element is scored one point for acceptable achievement, two points for commendable achievement and three points for exceptional achievement based on the assessment criteria given in the table above. For the practical test element to achieve a pass the apprentice must achieve a minimum score of four points. Please see the table below for the scoring and grading rules which must be applied when allocating the grade for the practical tests:

Pass	Merit	Distinction
4-6 points	7-10 points	11-12 points

Professional Dialogue and Interview

The professional dialogue and interview is a structured discussion between the apprentice and the independent assessor. It is recommended that the independent assessor conducting the professional discussion is not the same person who carried out the workplace observation assessment. Apprentices can only undertake the interview component once a pass as a minimum has been achieved in each of the other two end-point assessment components.

The professional dialogue and interview will assess the candidate's appreciation of behaviours for the industry.

It will focus on questions relating to the following behaviours:

- 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

The discussion must be appropriately structured to draw out the best of the apprentice's competence and excellence.

The professional dialogue and interview will be conducted in a 'controlled environment' i.e. a quiet room, away from the normal place of work. The interview will typically last 45 minutes and be no more than 60 minutes duration.

Independent assessors will select six questions from a bank of standardised competency based questions to ensure a consistent approach is adopted as well as ensuring all required areas of the standard are appropriately covered.

The professional dialogue and interview provides a basis for the independent assessor to make a holistic decision about the grade to be awarded for this component.

A structured brief and question bank will be developed by IAOs and the independent assessors will be developed and trained in the art of professional discussions and reaching consistent judgement.

The professional dialogue and interview will result in a pass, merit or distinction grade and it will contribute 15% to the weighting of the final apprenticeship certificate.

Grading of the professional dialogue and interview component will be based on:

Pass = Acceptable achievement

Apprentice shows appreciation of the behavioural aspects of the standard

Merit = Commendable achievement

As above, plus seeks ways to improve performance

Distinction = Outstanding achievement

As above, plus apprentice demonstrates effective improvement on current performance, suggesting, implementing and validating improvements to standards or ways of working

Apprenticeship Grading

Apprenticeship grading will be based on the outcomes from the end-point assessment.

Each component of the end-point assessment is individually marked and awarded a pass, merit or distinction based on the guidance given in this assessment plan. To achieve a pass overall the candidate must achieve a minimum of a pass in each of the end-point assessment components: knowledge test, practical tests and professional dialogue and interview.

In order to achieve a grade above a pass candidates are required to achieve a minimum of merit or distinction in the practical tests and one of either the knowledge test and professional dialogue and interview (totalling 75% of the weighting). To achieve a distinction the individual must achieve more than a pass for all components. The table in [Annex 1](#) outlines the grading rules applied in line with the allocated weighting of the individual components.

If the apprentice does not achieve as a minimum a pass in any part of the end-point assessment and it has to be re-taken, the apprentice cannot be awarded a distinction. It is expected that a period of further learning will need to be undertaken if the apprentice has to re-take any part of the end-point assessment.

End-point Assessment – Summary of Roles and Responsibilities

The employer, who may wish to take advice from the learning provider, will be responsible for signing off the apprentice as being ready to undertake end-point assessment.

IAOs will be responsible for:

- Design of a question bank for the written knowledge test component
- Design of observations and workplace projects in line with employer requirements and expectations
- Design of a set of competency based questions for the professional dialogue and interview component.

The IAO will be required to employ suitably experienced assessment staff who are able to administer and assess in line with the requirements of the assessment plan.

The IAO will need to employ independent assessors who are capable of overseeing and undertaking these different elements of assessment:

- Review of any documentation from on-programme elements
- Administration and marking of the knowledge test
- Assessment of an apprentice's performance in the end-point project and observations
- Leading and assessing the professional discussion and interview.

Independent assessors must be able to demonstrate they possess practical and up-to-date knowledge of current working practices appropriate to the sector in which they are carrying out assessment practice. They should hold or be working towards an assessor qualification. There are requirements to hold additional specialist training as required by the food and drink sector, which is detailed below.

Mandatory Requirements	Independent Assessors
A minimum 5 years' relevant industry experience with a producer or food manufacturer	√
Qualified above the level they are assessing	√
Food Safety Level 3 qualification	√
HACCP Level 3 qualification	√
Current professional membership of a relevant professional body	√

Internal Quality Assurance

Once assessment has been undertaken, the IAO will be responsible for:

- Moderation and verification of assessor judgements of the workplace project and observations through risk-based sampling
- Moderation and verification of the assessor judgements of the professional dialogue and interview component
- Moderation and verification of knowledge test component
- Standardisation of assessment judgements
- Secure recording and storage of all assessment decisions
- Verification of achievement of apprenticeship certificate
- Administration of certification process

Moderation, verification and standardisation of the assessment judgements is part of the IAO's internal quality assurance system. The judgement of the independent assessor must be subject to moderation and verification by the IAO's quality assurance team.

The IAO will monitor the assessment process and verify the assessment judgements to ensure consistency across assessors and across employers. This must be performed on a risk basis, i.e. new or poorly performing assessors must have every element of every assessment quality assured, but established, high performing assessors can be quality assured on a sampling basis, with at least one assessment activity being subject to either desk based or live internal quality assurance activity.

The IAO will run standardisation events for assessors at least every six months to ensure consistency in the practice of marking projects and observations, knowledge tests and professional discussions.

An IAO will employ expert assessors, but must also have internal quality assurance mechanisms and staff to verify assessor decisions as set out above and to administer the awarding of the apprenticeship.

External Quality Assurance

External quality assurance for the food and drink maintenance engineer apprenticeship will initially be undertaken by the Institute for Apprenticeships, whilst we are in conversation with Ofqual regarding them undertaking the role.

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 may wish to join a Professional Body.

This standard has been designed to deliver sufficient underpinning knowledge and understanding 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).

Implementation

The Food and Drink Engineering Maintenance apprenticeship standard does not replace an existing apprenticeship framework. It is anticipated there will be approximately 50-60 apprentices in the first year, and is expected to rise to approximately 200 per year.

A Level 3 Diploma in Food and Drink Engineering Maintenance on-programme qualification which includes a pass, merit and distinction grading will be available from September 2016.

The end-point assessment will cost no more than 20% of the overall apprenticeship.

Grading Matrix Food and Drink Engineering Maintenance

Annex 1

Knowledge Test	Practical Tests	Interview	Overall Grade
Pass	Pass	Pass	Pass
Pass	Pass	Merit	Pass
Pass	Pass	Distinction	Pass
Merit	Pass	Pass	Pass
Merit	Pass	Merit	Pass
Merit	Pass	Distinction	Pass
Distinction	Pass	Merit	Pass
Distinction	Pass	Distinction	Pass
Pass	Merit	Pass	Pass
Merit	Merit	Pass	Merit
Pass	Merit	Merit	Merit
Merit	Merit	Merit	Merit
Merit	Merit	Distinction	Merit
Distinction	Merit	Merit	Merit
Distinction	Merit	Distinction	Merit
Pass	Merit	Distinction	Merit
Distinction	Merit	Pass	Merit
Pass	Distinction	Pass	Pass
Merit	Distinction	Pass	Merit
Pass	Distinction	Merit	Merit
Merit	Distinction	Merit	Merit
Distinction	Distinction	Pass	Merit
Pass	Distinction	Distinction	Merit
Distinction	Distinction	Merit	Distinction
Merit	Distinction	Distinction	Distinction
Distinction	Distinction	Distinction	Distinction