FDQ - Qualification Specification

FDQ number	Qualification title	Qualification number	EQF Level	Review date
701-332	FDQ Level 3 Diploma in Food and Drink Engineering Maintenance	610/1418/7	3	31/08/2027

Qualification Purpose

This qualification is designed to develop and assess the skills and knowledge of maintenance engineering learners in the food and drink sector and to prepare them for employment or for further study.

It is also designed to support the learning and formative assessment of apprentices as they prepare for their End-point Assessment for the Food and Drink Maintenance Engineer (ST0195) apprenticeship.

This qualification available is in England. It is regulated by Ofqual, and meets Ofqual purpose B: *Prepare for further learning or training and/or develop knowledge and/or skills in a subject area. Sub purpose B2. Develop knowledge and/or skills in a subject area.*

To take this qualification, learners must be at least 16 years old. They do not require any prior qualifications or food sector experience to take this qualification. The qualification may be assessed in both the learner's learning environment and workplace to allow flexibility during the programme.

All learners must complete the mandatory skills and knowledge units associated with performing engineering operations and maintenance safely and efficiently. Learners may also choose to complete additional units.

Additional units are **not** required to achieve the FDQ Level 3 Diploma in Food and Drink Engineering Maintenance. The additional units offer learners the opportunity to gain recognition

for a broader range of skills and knowledge if required. Additional units are provided to meet employer requirements for their staff development or satisfy personal learning and development needs of learners.

This qualification could lead to

The qualification will support progression to further learning in:

1. Subject areas including;
    - engineering (e.g. maintenance, electrical or other specialisms)
    - food science and technology
    - food safety and quality compliance
    - management or team leading in a food environment

2. Qualifications including;
    - FDQ L3 Diploma for Proficiency in Food Management
    - FDQ L3 Certificate in Food Safety Supervision for the Food Industry
    - FDQ L3 Award in HACCP for Food Manufacturing

3. This qualification may support employment in/into management level roles including;
    - Food engineering maintenance manager
    - Food processing and manufacture technician/manager

Qualification support

This qualification has been designed and developed with the support of the Food and Drink Training and Education Council.

Further Information

Further information can be obtained from our website at: http://www.fdq.org.uk

Or by contacting FDQ:

Tel: 0113 859 1266

Email: fdq@fdq.org.uk

Assessment

Assessment evidence should be collected and presented in a portfolio of evidence.

Methods of assessment must be appropriate to the units and learning outcomes.

Practical skills should be assessed through assessor Observation and where appropriate supplemented by

- Practical demonstration/ assignments
- Professional discussion
- Presentation and questioning
- Coursework

Learners may include video recordings, witness testimony, workplace documentation and photographic evidence in their portfolio.

Knowledge and understanding should be assessed using

- Questioning
- Assignments
- Professional discussion
- Projects

Assignments and questions will be set by the centre and agreed with FDQ.

Assessments will be marked by the centre and subject to centre internal quality assurance and external quality assurance by FDQ.

Assessment criteria are set out in individual units of assessment (see exemplar D/650/3988 Perform engineering maintenance operations in the food and drink sector) and FDQ's Qualification Handbook.

FDQ has in place a quality system comprising policies and procedures to ensure its qualifications are effectively developed and delivered and that they remain fit for purpose. FDQ externally quality assures all centre assessment and internal quality assurance arrangements.

Achievement outcome

The qualification outcome is either pass or fail.

Rules of Combination (RoC)

To achieve the FDQ Level 3 Diploma in Food and Drink Engineering Maintenance learners must complete all mandatory units and may choose to complete up to six of the additional units.

FDQ Level 3 Diploma in Food and Drink Engineering Maintenance	
Total Qualification Time (TQT)	**2400**
Guided Learning Hours	**1187**
Group A – Mandatory	12 units
Group B – Additional	0-6 units
Minimum credits required	240 credits

List of units

Unit Ref	Unit type	Unit Title	Level	Credit	GLH
Group A Mandatory units					
L/650/3982	OC / UK	Principles of food and drink sector engineering	3	16	80
M/650/3983	OC / UK	Principles of safety and environmental regulations in food and drink sector engineering	3	12	65

Unit Ref	Unit type	Unit Title	Level	Credit	GLH
R/650/3984	OC / UK	Principles of electrical engineering operations in the food and drink sector	3	38	180
T/650/3985	OC / UK	Install, commission checks and decommission electrical equipment in food and drink sector engineering	3	30	140
A/650/3987	OC / UK	Perform mechanical engineering operations in the food and drink sector	3	22	106
D/650/3988	OC / UK	Perform engineering maintenance operations in the food and drink sector	3	24	110
F/650/3989	OC / UK	Produce replacement components for maintenance activities in food and drink sector engineering	3	35	160
K/650/3990	OC / UK	Weld replacement components for maintenance activities in food and drink sector engineering	3	25	120
L/650/3991	OC / UK	Principles of quality and continuous improvement in food and drink sector engineering	3	8	48
M/650/3992	OC / UK	Principles of maths and science in food and drink sector engineering	3	10	60

Unit Ref	Unit type	Unit Title	Level	Credit	GLH
R/650/3993	OC / UK	Principles of using representations, drawings and graphs in food and drink engineering	3	12	60
T/650/3994	OC / UK	Principles of team working and self-development in food and drink sector engineering roles	3	8	58
Group B Additional units					
Y/650/3995	OC / UK	Welding techniques for food and drink sector engineering	3	8	72
A/650/3996	OC / UK	Principles of electrical installations BS7671 (2018)	3	5	40
F/601/2954	UK	Principles of continuous improvement techniques (Kaizen) in food operations	3	3	15
M/602/4498	UK	Principles of using Information Communication Technology (ICT) and Management Information Systems (MIS) in food technology	3	3	23
L/601/2701	UK	Principles of sustainability in food operations	3	4	34
A/602/4701	OC	Control energy efficiency in food operations	3	3	13

Unit Ref	Unit type	Unit Title	Level	Credit	GLH
H/602/1713	OC	Maintain, promote and improve environmental good practice in food operations	3	2	10
J/504/7355	OC	Contribute to project management in a food business	3	3	20

Exemplar unit of assessment

Title	Perform engineering maintenance operations in the food and drink sector				
Regulatory unit reference	D/650/3988				
Level	3	Credit value	24	GLH	110
Learning outcomes	**Assessment criteria**				
The learner will:	**The learner can:**				
1. Understand health and safety procedures for engineering maintenance in the food and drink sector	1.1 Describe the safe isolation procedures for the following systems: • fluid (hydraulic) • gas (pneumatic) • electricity • other stored energy such as tensioned springs 1.2 Explain the term Lockout, Tagout (LOTO) 1.3 Describe the process and requirements for a permit to work.				
2. Understand best practice maintenance strategies used in the food and drink sector	2.1 Describe the function and uses of the following maintenance strategies: • run to failure (breakdown maintenance) • planned preventive maintenance (PPM) • predictive maintenance (PdM) • reliability centred maintenance (RCM) 2.2 Evaluate the benefits and challenges of maintenance strategies.				
3. Understand equipment performance measures used in the food and drink sector	3.1 Explain the types of data used to measure performance				

	3.2 Explain the terms 'mean time between failure' and 'overall equipment effectiveness' (OEE) availability 3.3 Read and interpret equipment performance data.
4. Understand the types of tools used for maintenance in the food and drink sector	4.1 Explain the typical tools used in maintenance, their purposes and how to use them 4.2 Explain how to maintain a range of maintenance tools 4.3 Describe the storage requirements for maintenance tools in the food and drink sector 4.4 Describe the relevant restrictions for maintenance tools and their use in food and drink sector 4.5 Describe the meaning of 'designated areas' 4.6 Describe the service considerations required when obtaining spare components.
5. Understand reliability techniques used in maintenance in the food and drink sector	5.1 Describe the following reliability techniques (critical tools): • condition monitoring • oil sampling • thermography • vibration analysis • ultrasound 5.2 Describe how the following techniques (critical tools) are used to reduce breakdowns, failures, and operational losses: • condition monitoring • oil sampling • thermography

	• vibration analysis • ultrasound
6. Understand the fundamental principles of pneumatic and hydraulic systems	6.1 Describe the uses of pneumatic and hydraulic systems in food and drink manufacturing 6.2 Describe how hydraulics are typically use in the food and drink sector for the transfer of energy 6.3 Compare the differences between pneumatic and hydraulic systems, considering the benefits and constraints of each system.
7. Demonstrate how to isolate, lock off (lockout, tagout) and re-instate equipment	7.1 Follow site isolation and lock off procedures for the following: • fluid (hydraulic) • gas (pneumatic) • electricity • other stored energy such as tensioned springs 7.2 Re-instate equipment with system checks once the maintenance activity is complete 7.3 Complete formal handover of equipment to the appropriate person(s) according to procedures.
8. Demonstrate how to use maintenance tools in the food and drink sector	8.1 Create a plan for maintenance activities including the selection of appropriate tooling 8.2 Apply checks for the condition of the tooling 8.3 Use tools safely during workplace maintenance activities, including: • torque wrenches (types and uses) • Stilson wrenches • impact drivers

	• pulling devices (mechanical and hydraulic) • extractors • feeler gauges • greasing and lubrication equipment • cleaning equipment (de-greasing plant and steam cleaning) • thermal paints and crayons (Segar cones) • tachometers • stroboscopes • accelerometers • multimeters – voltage, resistance and current • power factor meters • insulation resistance meter • logic probes • oscilloscopes – signal amplitude and frequency • manometers • bourbon tube 8.4 Store tools and equipment in their correct location once the maintenance activity is complete 8.5 Arrange for tooling and / or equipment calibration.

9. Demonstrate how to maintain mechanical and fluid power systems	9.1 Maintain mechanical and fluid power systems, by completing the following maintenance checks: • check levels • parts wear • pressure • sensors • grease and lubricate parts • replace • fit components • calibrate equipment.
10. Demonstrate how to use engineering reliability processes to prevent or reduce the likelihood of failures.	10.1 Prevent or reduce the likelihood or frequency of failures, by using the following techniques: • condition monitoring • oil sampling • thermography • vibration analysis • ultrasound.
Purpose and assessment overview	
Unit purpose and aim(s)	The aim of the unit is to assess the learner's knowledge and skills in engineering maintenance operations (including use of pneumatic and hydraulic systems) for the food and drink sector.
Assessment requirements and guidance	Assessment requirements and guidance are set out in the Qualification Specification and Handbook.
Additional information about this unit	

Details of the relationship between the unit and relevant national occupational standards or other professional standards or curricula	This unit is linked to the apprenticeship standard Food and Drink Maintenance Engineer (ST0195)
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