

Qualification title: OAL Level 3 Diploma in Food and Drink Engineering Maintenance

Qualification number (QN): 603/2374/7

Qualification Specification

1.1 Qualification purpose

This qualification is designed to develop and assess the competent performance of those involved in food engineering maintenance in food and drink manufacturing operations, and develop the necessary skills, knowledge, understanding and behaviours to work effectively in their role.

On achievement of the qualification learners will have developed the level of competence which will enable them to perform consistently, reliably and productively in their work role, and make a positive contribution to their employment.

This qualification will support progression of learners to:

- increased responsibility or promotion opportunities in work
- level 4 vocational qualifications in engineering/management/quality and improvement
- apprenticeships for the food and drink industry
- engineering or management related job roles in food and drink.

1.2 Who is this qualification for?

This qualification is designed for learners who are looking to learn and apply their skills in maintenance engineering roles in food and drink operations. Learners who have some experience of process or maintenance operations and wish to continue their professional development will also benefit from the knowledge, understanding and skills that this qualification provides. This qualification will also provide the appropriate skills, knowledge and behaviours required by the Apprenticeship Standard for the Food and Drink Maintenance Engineer and is cited as the mandatory qualification to achieve the gateway to end-point assessment.

Food and Drink Maintenance Engineers work in one of the largest, most dynamic and fastest growing sectors of industry. Every day, producers, manufacturers and retailers make and sell millions of innovative food products to consumers in the UK and around the world. This includes drinks, cakes, biscuits, ready-to-eat and ready-to-cook food, sandwiches, wraps, fresh

fruit and salads. The industry uses excellent manufacturing processes and highly automated equipment and technology to ensure it remains competitive, and produces food and drink products to strict food safety and quality standards.

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 Maintenance 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 replacement of parts. They must ensure that maintenance activities contribute to optimising food and drink production levels, and critically maintain compliance standards within the business.

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 this affects food industry maintenance practices. They will work autonomously, taking responsibility for their own individual tasks, and also work effectively in teams.

1.3 Entry requirements

There are no formal entry requirements for learners selecting this qualification. Centres must ensure that learners have the potential and opportunity to achieve the qualification successfully. This qualification is not approved for use by learners under the age of 16 years and OAL cannot accept any registrations for learners in this age group.

1.4 Regulatory information

| | |
|--------------------------------------|--------------------------------|
| Regulated by | Ofqual |
| Countries offered in: | England |
| Ofqual Subject/Sector Area | 4.2 Manufacturing technologies |
| Qualification operational start date | 12th September 2017 |
| Qualification review date: | 31st August 2022 |
| Applicable age ranges (years): | 16-18; 19+ |

1.5 Qualification coverage

On achievement of this qualification, learners will have an in-depth knowledge and understanding of food industry regulations, materials science, quality and continuous improvement management systems, services and utilities knowledge, thermodynamics, mechanical and electrical systems, maintenance techniques and approaches and food processing/product knowledge. Learners will be able to contribute to maintaining compliance including health and safety, food safety management and cleaning processes. Learners will be competent in core maintenance engineering activities including planning and preparing for maintenance, mechanical maintenance, electrical maintenance, problem solving, producing replacement components, cutting and welding, maintaining fluid power systems and applying mathematical techniques. Learners will also exhibit a range of behaviours commensurate with workplace practice including ownership of work, self-development, integrity and respect and effective communication with colleagues.

Learners will have developed valuable skills which will enable them to make an immediate, productive and positive contribution to their employment. They will be empowered to learn, develop themselves and progress their learning experiences and promotional opportunities. They will be able to develop and maintain professional relationships with colleagues and act as an ambassador for the maintenance engineering role with a food business. This qualification is an ideal spring-board for potential future maintenance engineers/ managers in the food and drink industry.

1.6 Qualification support

This qualification is supported by a number of Further Education Colleges and Independent Providers of post-16yrs training and education as facilitating completion of the skills, knowledge and behavioural requirements for the:

- Food and Drink Maintenance Engineer Apprenticeship Standard

1.7 Further information

Further information about this qualification can be obtained from:
<http://www.oawards.co.uk/quals/food-drink/>

You can also contact OAL directly at:

Occupational Awards Ltd, The Catalyst, Baird Lane, Heslington, York, YO10 5GA

Tel: 01904 236 483 Email: info@oawards.co.uk

1.8 Qualification achievement

This qualification is a Diploma and is made up of two optional pathways. The pathways in Mechanical Maintenance and Multi-skilled Maintenance will enable learners in different food and drink organisations to select the most appropriate pathway for their learning and development needs and for achievement within their role. Each pathway contains 14 mandatory units of assessment and 3 pathway units of assessment, totalling 17 units that must be successfully completed to achieve the qualification.

Each unit is allocated a credit value which provides an indication of the size of the unit in terms of learning hours, 1 credit = 10 learning hours. Units also have assigned Guided Learning Hours (GLH), which indicate the average number of hours a learner may require guidance and support from teaching, learning and assessment professionals to achieve units.

The units set out the things learners need to know and need to do in order to perform effectively in their role at work. These are described in Learning Outcomes in units of assessment. The Learning Outcomes are defined by Assessment Criteria and these criteria must be assessed successfully for a learner to achieve each unit. Details of the grading arrangements for the qualification are set out in section 4 Grading Requirements.

Achievement of all mandatory and required pathway units will mean the qualification has been completed, and will be subject to grading and to approval of a claim for certification, OAL will issue a certificate complete with the learner's name, the qualification title and the credits and

grade achieved. Where a learner has not achieved the full qualification and will not go on to do so, a Certificate of Unit Achievement can be issued for the units successfully completed, however these units will not be graded.

Centres must ensure they understand all qualification requirements prior to the registration of learners and prior to carrying out assessment of learners and the grading of the qualification. Assessment of learners must not take place prior to the registration date of the learner with OAL. Centres must retain copies of learner's assessment records for at least three years after certification. Registration and certification fees may be subject to change. Centres should be fully aware of registration and certification end dates to ensure learners are not disadvantaged.

1.9 Qualification structure

OAL Level 3 Diploma in Food and Drink Engineering Maintenance

Qualification number (QN): 603/2374/7

Total Qualification Time (TQT) 2,580 hours

Total Qualification Credits 258

Guided Learning Hours (GLH) 1,450

This qualification consists of 2 pathways, learners must select one pathway. All mandatory units must be successfully completed as well as the units within a pathway to achieve the qualification.

Mandatory units of assessment:

| Number | Title | Type | Level | Credit | GLH |
|------------|--|------|-------|--------|-----|
| T/616/3869 | Principles of processing and the supply chain for food and drink engineering maintenance | U | 3 | 5 | 40 |
| K/616/3870 | Principles of quality and continuous improvement for food and drink engineering maintenance | U | 3 | 4 | 32 |
| M/616/3871 | Principles of materials science for food and drink engineering maintenance | U | 3 | 13 | 108 |
| T/616/3872 | Principles of thermodynamics for food and drink engineering maintenance | U | 3 | 10 | 80 |
| A/616/3873 | Principles of services and utilities in food and drink engineering maintenance | U | 3 | 12 | 90 |
| F/616/3874 | Maintain compliance in food and drink engineering maintenance | C | 3 | 21 | 110 |
| J/616/3875 | Plan and prepare maintenance in food and drink engineering | C | 3 | 14 | 75 |
| L/616/3876 | Perform first-line mechanical maintenance in food and drink engineering | C | 3 | 12 | 60 |
| Y/616/3878 | Maintain fluid power systems in food and drink engineering maintenance | C | 3 | 14 | 75 |
| D/616/3879 | Perform first-line electrical maintenance in food and drink engineering | C | 3 | 20 | 100 |
| R/616/3880 | Produce replacement components in food and drink engineering maintenance | C | 3 | 30 | 150 |
| Y/616/3881 | Cut and weld materials in food and drink engineering maintenance | C | 3 | 16 | 80 |
| D/616/3882 | Apply mathematical techniques in food and drink engineering maintenance | S | 3 | 21 | 110 |
| H/616/3883 | Develop self and maintain professional relationships in food and drink engineering maintenance | S | 3 | 12 | 60 |

OAL Level 3 Diploma in Food and Drink Engineering Maintenance (Mechanical Maintenance)

Pathway units of assessment:

| | | | | | |
|------------|--|---|---|----|-----|
| K/616/3884 | Monitor mechanical equipment in food and drink engineering maintenance | C | 3 | 13 | 70 |
| M/616/3885 | Repair and produce complex mechanical components in food and drink engineering maintenance | C | 3 | 26 | 130 |
| T/616/3886 | Produce complex welded joints in food and drink engineering maintenance | C | 3 | 15 | 80 |

OAL Level 3 Diploma in Food and Drink Engineering Maintenance (Multi-skilled Maintenance)

Pathway units of assessment:

| | | | | | |
|------------|--|---|---|----|-----|
| A/616/3887 | Commission and maintain electrical equipment in food and drink engineering maintenance | C | 3 | 26 | 130 |
| J/616/3889 | Perform programmable control system maintenance in food and drink engineering | C | 3 | 22 | 110 |
| A/616/3890 | Principles of electrical installations BS7671 (2015) | U | 3 | 6 | 40 |

Key to unit type

1. Competence (C) units are designed to assess learner performance in respect of the learner's applied skills and knowledge in the workplace when carrying out operational tasks required by their role
2. Skills (S) units are designed to assess learner performance in respect of the learner's applied skills that demonstrate valid, consistent and reliable practice
3. Underpinning knowledge (U) units are designed to assess the learner's knowledge and understanding of detailed subject principles/scientific/technological knowledge

1.10 Assessment

The qualification is assessed using the following assessment methods, these methods have been chosen in order to assist in the preparation of apprentices for end-point assessment including:

- Assignment or direct learner responses
- Tests (multiple-choice and short answer questions)
- Observation of learner performance

All centre devised assessment materials must be agreed with OAL and signed off before implementation.

Learners are required to achieve all learning outcomes within each unit of assessment.

All assessment is subject to internal quality assurance within approved centres providing this qualification.

Externally quality assurance of assessment and internal quality assurance within approved centres is provided by OAL.

This qualification is graded; achievement certificates for this Diploma are issued on the basis of awarding a fail, pass, merit or distinction.

| Assessment of units | | | |
|---------------------|---|--|--------------------------|
| Number | Title | Assessment method | Assessment available at: |
| T/616/3869 | Principles of processing and the supply chain for food and drink engineering maintenance | Assignment or direct learner responses (DLR) | OAL portal |
| K/616/3870 | Principles of quality and continuous improvement for food and drink engineering maintenance | Multiple choice test | OAL portal |
| M/616/3871 | Principles of materials science for food and drink engineering maintenance | Short answer test | OAL portal |
| T/616/3872 | Principles of thermodynamics for food and drink engineering maintenance | Short answer test | OAL portal |
| A/616/3873 | Principles of services and utilities in food and drink engineering maintenance | Multiple choice test | OAL portal |
| F/616/3874 | Maintain compliance in food and drink engineering maintenance | Performance observation and multiple choice test | OAL portal |
| J/616/3875 | Plan and prepare maintenance in food and drink engineering | Performance observation and assignment or DLR | OAL portal |
| L/616/3876 | Perform first-line mechanical maintenance in food and drink engineering | Performance observation and assignment or DLR | OAL portal |
| Y/616/3878 | Maintain fluid power systems in food and drink engineering maintenance | Performance observation and assignment or DLR | OAL portal |
| D/616/3879 | Perform first-line electrical maintenance in food and drink engineering | Performance observation and assignment or DLR | OAL portal |

| Number | Title | Assessment method | Assessment available at: |
|------------|--|---|--------------------------|
| R/616/3880 | Produce replacement components in food and drink engineering maintenance | Performance observation and assignment or DLR | OAL portal |
| Y/616/3881 | Cut and weld materials in food and drink engineering maintenance | Performance observation and assignment or DLR | OAL portal |
| D/616/3882 | Apply mathematical techniques in food and drink engineering maintenance | Short answer test | OAL portal |
| H/616/3883 | Develop self and maintain professional relationships in food and drink engineering maintenance | Performance observation and Structured professional interview | OAL portal |
| K/616/3884 | Monitor mechanical equipment in food and drink engineering maintenance | Performance observation and assignment or DLR | OAL portal |
| M/616/3885 | Repair and produce complex mechanical components in food and drink engineering maintenance | Performance observation and assignment or DLR | OAL portal |
| T/616/3886 | Produce complex welded joints in food and drink engineering maintenance | Performance observation and assignment or DLR | OAL portal |
| A/616/3887 | Commission and maintain electrical equipment in food and drink engineering maintenance | Performance observation and assignment or DLR | OAL portal |
| J/616/3889 | Perform programmable control system maintenance in food and drink engineering | Performance observation and assignment or DLR | OAL portal |
| A/616/3890 | Principles of electrical installations BS7671 (2015) | Multiple choice test | OAL portal |

1.11 Map of qualification to Food and Drink Maintenance Engineer Apprenticeship Standard

| Qualification title: OAL Level 3 Diploma in Food and Drink Engineering Maintenance | | |
|--|---|--|
| Units of assessment: | | |
| Number | Title | Unit contains skills, knowledge and behaviours required by the standard: |
| T/616/3869 | Principles of processing and the supply chain for food and drink engineering maintenance | <p>Core knowledge:</p> <ul style="list-style-type: none"> Food processing/manufacturing and product knowledge (to meet company requirements e.g. Dairy/Confectionery/Meat processing (K1) The impact of customer requirements and demands on the food supply chain (K4) <p>Behaviours</p> <ul style="list-style-type: none"> Company/industry perspective: knowledge of company and food industry (B9.1) |
| K/616/3870 | Principles of quality and continuous improvement for food and drink engineering maintenance | <p>Core knowledge:</p> <ul style="list-style-type: none"> The key principles of quality management systems and processes (K6) The key principles of Continuous Improvement (CI) Management (K7) |
| M/616/3871 | Principles of materials science for food and drink engineering maintenance | <p>Core knowledge:</p> <ul style="list-style-type: none"> Materials science, including the key features of raw materials, their uses in food production and types of equipment used (K8) |
| T/616/3872 | Principles of thermodynamics for food and drink engineering maintenance | <p>Core knowledge:</p> <ul style="list-style-type: none"> The operation of heat exchange equipment (K14) |
| A/616/3873 | Principles of services and utilities in food and drink engineering maintenance | <p>Core knowledge:</p> <ul style="list-style-type: none"> Services and utilities knowledge, including the importance and impact of energy management and pollution control in food production (K17) |
| F/616/3874 | Maintain compliance in food and drink engineering maintenance | <p>Core knowledge:</p> <ul style="list-style-type: none"> Legislation and regulations in the food and drink industry, including understanding of: food safety, health and safety, HACCP, TACCP, VACCP (K2) Basic principles of sustainability and environmental legislation (K3) The key principles of cleaning and hygiene processes covering both Cleaning in Place (CIP) and cleaning out of place systems (K5) <p>Behaviours:</p> <ul style="list-style-type: none"> Safe working: ensures safety of self and others, food safe, challenges safety issues (B1) |

| Number | Title | Unit contains skills, knowledge and behaviours required by the standard: |
|------------|---|--|
| J/616/3875 | Plan and prepare maintenance in food and drink engineering | <p>Core knowledge:</p> <ul style="list-style-type: none"> Types of best practice maintenance approaches and techniques in the food and drink industry (K9) The principles of fault finding techniques (K10) <p>Core skills:</p> <ul style="list-style-type: none"> Plan and prepare for maintenance of engineered systems in the food and drink industry (S1) <p>Behaviours:</p> <ul style="list-style-type: none"> Safe working: food safe (B1.2) |
| L/616/3876 | Perform first-line mechanical maintenance in food and drink engineering | <p>Core knowledge:</p> <ul style="list-style-type: none"> The operation of mechanical equipment in the food and drink industry (K11) <p>Core skills:</p> <ul style="list-style-type: none"> Perform first line mechanical maintenance, including removing and replacing components, cleaning, lubrication, inspection and fault finding (S2) Apply best practice techniques including condition monitoring and proactive maintenance (S3) <p>Behaviours:</p> <ul style="list-style-type: none"> Safe working: ensures safety of self and others, food safe (B1.1, 1.2) Problem solving: takes responsibility until a solution is reached, challenges others, works to solve root cause of problems (B7) |
| Y/616/3878 | Maintain fluid power systems in food and drink engineering maintenance | <p>Core knowledge:</p> <ul style="list-style-type: none"> The function of fluid power systems (K13) <p>Core skills:</p> <ul style="list-style-type: none"> Apply best practice techniques including condition monitoring and proactive maintenance (S3) Maintain fluid power systems (S5) <p>Behaviours:</p> <ul style="list-style-type: none"> Safe working: ensures safety of self and others, food safe (B1.1, 1.2) Problem solving: takes responsibility until a solution is reached, challenges others, works to solve root cause of problems (B7) |
| D/616/3879 | Perform first-line electrical maintenance in food and drink engineering | <p>Core knowledge:</p> <ul style="list-style-type: none"> Principles of electrical systems, including their uses, safety and legislation (K16) <p>Core skills:</p> <ul style="list-style-type: none"> Apply best practice techniques including condition monitoring and proactive maintenance (S3) Perform first line electrical maintenance, including testing, fault finding, repairing and replacing components (S7) <p>Behaviours:</p> <ul style="list-style-type: none"> Safe working: ensures safety of self and others, food safe (B1.1, 1.2) Problem solving: takes responsibility until a solution is reached, challenges others, works to solve root cause of problems (B7) |

| Number | Title | Unit contains skills, knowledge and behaviours required by the standard: |
|------------|--|---|
| R/616/3880 | Produce replacement components in food and drink engineering maintenance | <p>Core knowledge:</p> <ul style="list-style-type: none"> How to produce replacement components (K12) <p>Core skills:</p> <ul style="list-style-type: none"> Produce replacement components, using manual and machine processes (S4) <p>Behaviours:</p> <ul style="list-style-type: none"> Safe working: ensures safety of self and others, food safe (B1.1, 1.2) |
| Y/616/3881 | Cut and weld materials in food and drink engineering maintenance | <p>Core knowledge:</p> <ul style="list-style-type: none"> The principles of cutting and welding in the food and drink industry (K15) <p>Core skills:</p> <ul style="list-style-type: none"> Weld stainless steel and other materials used in food production equipment (S6) <p>Behaviours:</p> <ul style="list-style-type: none"> Safe working: ensures safety of self and others, food safe (B1.1, 1.2) |
| D/616/3882 | Apply mathematical techniques in food and drink engineering maintenance | <p>Core skills:</p> <ul style="list-style-type: none"> Apply mathematical techniques to solve engineering problems (S8) |
| H/616/3883 | Develop self and maintain professional relationships in food and drink engineering maintenance | <p>Behaviours:</p> <ul style="list-style-type: none"> Ownership of work: accepts responsibility, is proactive, plans work (B2) Pride in work: integrity, aims for excellence, time management (B3) Self-development: links own objectives to support the business, seeks learning and development opportunities (B4) Integrity and respect: for colleagues, good communication with managers (B5) Working in a team: builds good relationships with others (B6) Responsiveness to change: flexibility to changing environment and demands (B8) Company/industry perspective: acts as an ambassador (B9.2) Effective communication: with colleagues/managers, in writing, visually, verbally (B10) |
| K/616/3884 | Monitor mechanical equipment in food and drink engineering maintenance | <p>Mechanical maintenance skills:</p> <ul style="list-style-type: none"> Monitor mechanical equipment in food and drink operations (MM1) |
| M/616/3885 | Repair and produce complex mechanical components in food and drink engineering maintenance | <p>Mechanical maintenance skills:</p> <ul style="list-style-type: none"> Repair and produce replacement complex mechanical components to required standards (MM2) |

| Number | Title | Unit contains skills, knowledge and behaviours required by the standard: |
|------------|--|--|
| T/616/3886 | Produce complex welded joints in food and drink engineering maintenance | <p>Mechanical maintenance skills:</p> <ul style="list-style-type: none"> Produce complex welded joints in a range of positions using a range of different processes (MM3) Review welding activities (MM4) |
| A/616/3887 | Commission and maintain electrical equipment in food and drink engineering maintenance | <p>Multi-skilled maintenance skills and knowledge:</p> <ul style="list-style-type: none"> Understand the principles of electrical machines, testing electrical equipment and circuits (MS1) Commission and perform maintenance of instrumentation /process control systems (MS3) |
| J/616/3889 | Perform programmable control system maintenance in food and drink engineering | <p>Multi-skilled maintenance skills and knowledge:</p> <ul style="list-style-type: none"> Understand the operation of process controllers within an engineered system (MS2) Perform maintenance of programmable control systems (MS4) |
| A/616/3890 | Principles of electrical installations BS7671 (2015) | <p>Multi-skilled maintenance skills and knowledge:</p> <ul style="list-style-type: none"> Understand the requirements of electrical installations (MS5) |