

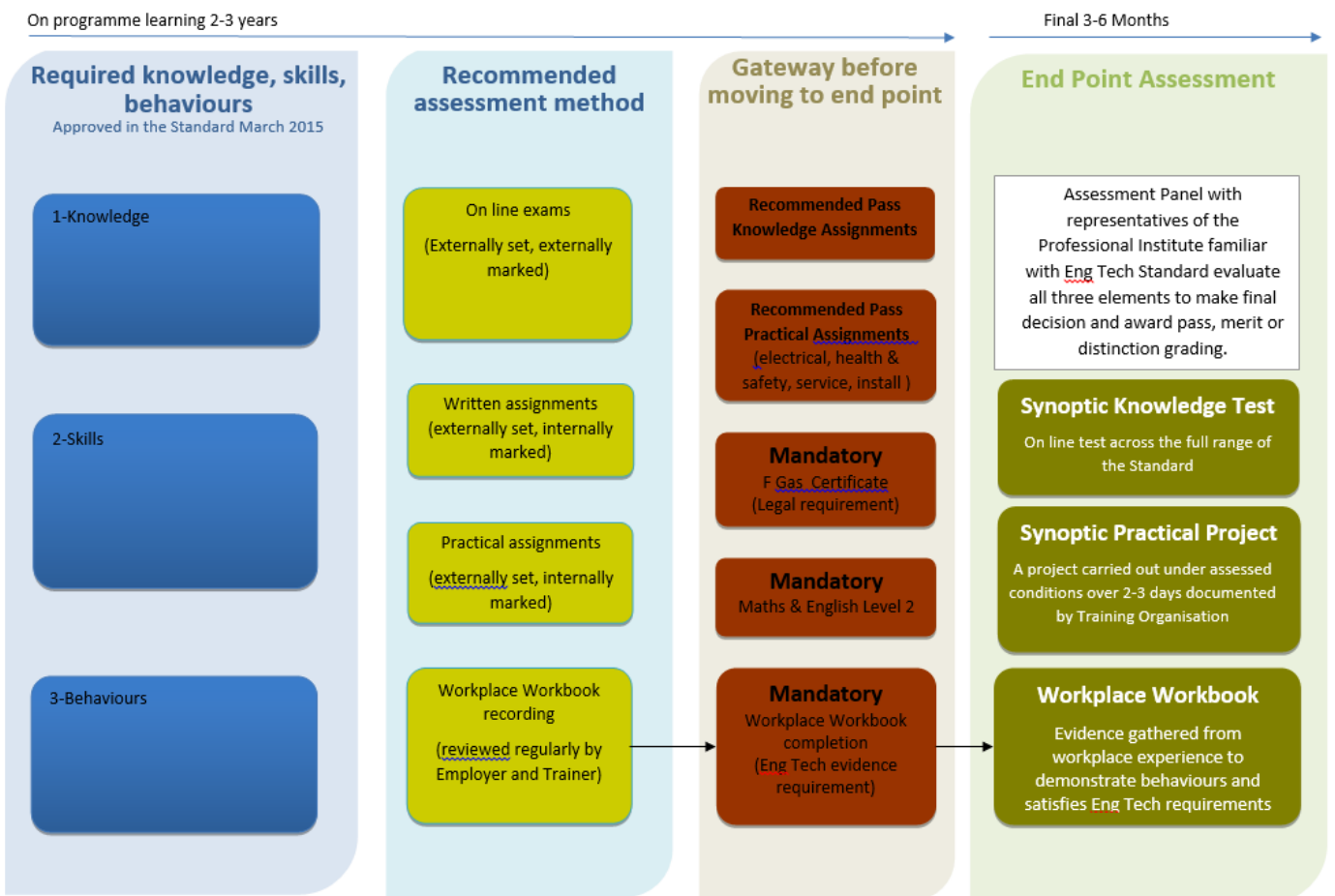
Assessment Plan for the Refrigeration Air Conditioning and Heat Pump Engineering Technician Apprenticeship

Introduction

The Refrigeration Air Conditioning and Heat Pump (RACHP) Engineering Technician Apprenticeship Standard reflects the needs of employers who employ a range of apprentices to carry out work in a variety of roles in installation, commissioning, service and maintenance of systems in a variety of application use such as retail refrigeration in supermarkets, bespoke industrial freezing processes, and air conditioning or heat pumping in commercial buildings. Employers are primarily microbusinesses, although there are a small number of SME businesses, and as such Apprentices are expected to acquire a broad range of skills and focus in on how they are applied in their specific role. The sector demands that Apprentices have a high degree of scientific, technical and engineering knowledge in order to carry out their work safely for those in the immediate environment, and to maximise efficiency and reliability of operation.

Employers expect that assessment under this Apprenticeship will be proportionate, consistent and reliable. As this is a highly specialised occupation, which requires Apprentices to have access to test equipment and workshop experience, employers work closely with specialised well equipped training providers either in-house or independent. Employers have an increasing role to play in working with Training Organisations to ensure the appropriate supervision and assessment of competence of their Apprentices. The industry is well organised with Trade Associations and Professional Bodies who work collaboratively to maintain general standards, and they have also supported and contributed to the drafting of the Assessment Plan.

RACHP Engineering Technician Apprenticeship – Proposed Assessment Principles



SECTION A -- Summary of assessment

The end-point assessment of higher level integrated skills will assess how the individual can apply their skills, knowledge and behaviours in their day to day job, through three assessments carried out in the final 3-6 months of the Apprenticeship:

- 1- Synoptic **End Point Knowledge Exam**, in the form of a secure on line multiple choice exam covering the complete range of the Apprenticeship Standard. The exam will be independently set and assessed by the Awarding Organisation with input on content from Professional Institutes.
- 2- A **Practical Project** carried out over 2-3 days under one-to-one supervision of a Training Organisation, with activity documented, and recorded by the Training Organisation against the Standard. This assessment will be independently set and verified by the Awarding Organisation. The specification and marketing sheets for the Practical Project will be standardised to be appropriate for apprentices working in any size of organisation or relevant specialist area of work.
- 3- Submission of a completed **Workplace Evidence Workbook** will form the final element of the end point assessment. The Workbook will be documented by the Apprentice, verified by their Employer and mapped against the Standard by the Training Organisation using a standardised template. The template for the Workbook will be standardised to be appropriate for apprentices working in any size of organisation or relevant specialist area of work. The contents of the workbook will be assessed by an Independent Panel as part of the Grading of the Apprenticeship. Workbooks developed throughout the programme are fully assessed as part of the end point assessment only and are not used for any on programme assessment. The Workbook evidence will be used to demonstrate that the Apprentice satisfies the Engineering Council registration requirements at Engineering Technician level including elements such as on-going professional development and learning over their career that cannot be evidenced by the End Point Knowledge Exam or Practical

Project alone.

Gateway Assessments

- Candidates must complete their **Workplace Evidence Workbook** as verified by the Training Organisation and Employer, before they take the first two elements of the End Point Assessment.
- Achievement of an individual F Gas Certification (Category 1) is a **mandatory qualification** as specified in the Apprenticeship Standard as this is a legal requirement under Statutory Instrument No 2015 No. 310, Environmental Protection, "The Fluorinated Greenhouse Gases Regulations 2015". This must be achieved before the final end point assessment is undertaken. The F Gas Certification comprises a practical and knowledge test on elements related to environmental impact of RACHP work.

Independent Assessment and Final Decision

The **final decision** and Grading (pass, merit or distinction) for each Apprenticeship award will be made by an Assessment Organisation which will establish an **Independent Panel** to carry out the end point assessment taking into account all three methods of end point assessment evidence. The Independent Panel must include representatives of the Professional Institute to ensure independence and technical competence of assessors. The three elements of evidence provided by each candidate will be independently assessed against the Apprenticeship Standard and the Engineering Council Engineering Technician Standard. The evidence provided does not need to include the whole of the Apprenticeship Standard requirements, but must reflect their actual day-to-day work and how they are applying a range of the knowledge, skills and behaviours included within that Standard.

On-programme Assessment

In order to be prepared for the end-point assessment it is **recommended** that the following **on-programme assessment methods** should be used:

- 1) exams to test knowledge acquisition which are set and marked independently of the training organisation (eg on line multiple choice)
- 2) short assignments to test practical skills including electrical, pipefitting, health and safety, installation and service/maintenance. These assignments should be set independently by an Awarding Organisation and assessed by the Training Organisation (eg observed workshop projects and written test projects)

SECTION B -- Detailed explanation of the end-point assessment

B1. Skills, knowledge and behaviours to be assessed and how they will be assessed are detailed in the Employer Occupational Brief Annex 1 and Apprenticeship Standard Annex 2

B2. Who will do the Assessment

B2.1 Employers' role

The Employer does not take part in the Assessment of Apprentices but is responsible for arranging the following:

- **On programme** - Employers play an important role in preparing workplace activity, supervising practical work and authenticating the Workplace Evidence Workbook. Apprentices will be provided with a standardised Workplace Workbook Template by the Assessment Organisation developed with input from the Professional Institute to record evidence.
- **Gateway** - Employers must confirm that the candidate is suitably prepared for the end point assessments, based on their final authentication of the Workplace Evidence Workbook.

B2.2 Training Organisations' role

- **On programme**– It is recommended that Training Organisations administer any practical exercises and knowledge assessments including on line tests and practical assignments (including the mandatory qualification specified in the Standard). They will provide regular review and verification of evidence gathered from the work place in the Workplace Evidence Workbook helping to map the candidate's

experience to the Standards to ensure the Apprentices is acquiring suitable knowledge, skills and behaviours to prepare for the end point assessment and recording evidence required for Engineering Council Engineering Technician registration.

- **Gateway** - They will confirm that the candidate has achieved the Mandatory Qualification specified in the Standard, and that the candidate is suitably prepared to take the end point assessments through verification that the Workplace Evidence Workbook contents meet the requirements of the Standard using a standardised template provided by the Assessment Organisation before being submitted for assessment by the Independent Panel as part of the End Point Assessment.
- **End point assessment** – Training organisations will submit supporting evidence for all three End Point Assessments for each candidate to the Independent Panel. They will administer the Synoptic End Point Knowledge Exam which will be set and marked by the Assessment Organisation. They will organise, supervise, record, document and assess the Synoptic End Point Practical Project which will be independently set by an Assessment Organisation, using a marking template provided by the Assessment Organisation. They must be qualified to national assessor standards and additionally hold a qualification equivalent or above to the level of this Apprenticeship in a refrigeration, air conditioning or heat pump related subject as defined by the Assessment Organisation.
- Employers who wish to carry out this process in house will need to ensure that independent third party Assessment Organisations are used for assessment processes.

B2.3 End Point Assessment by Independent Panel

- An Independent Panel will assess whether an Apprenticeship Certificate will be awarded and at what grade, based on:
 1. The results of an on line Knowledge Exam set and marked by the Assessment Organisation.
 2. The documented records of the Practical Project set by an Assessment Organisation and marked by the Training Organisation.
 3. The contents of a completed candidate Workplace Evidence Workbook verified by the Training Organisation and authenticated by the Employer.
- The Panel will make the final decision on whether the candidate is to be awarded a pass, merit or distinction grading.
- All Evidence from each Apprentice must be assessed by at least three members of the Panel. The final results and grading being agreed by the majority.
- The Panel will be established by an Awarding Organisation. The Panel must include representatives of the Professional Institute, who are able to assess evidence against both the Apprenticeship Standard and the Engineering Council Engineering Technician requirements. Member of the Panel must have current industry knowledge (Member or Fellow grade of the Institute of Refrigeration) and must be independent of the employer or training provider of the candidate being assessed. Individuals on the Panel must be qualified to Level 3 equivalent or above in a RACHP relevant subject.
- Employers who wish to carry out this process in house must additionally ensure that all members of the Assessment panel are independent and have not worked with the Apprentice being assessed.

B3. Quality Assurance

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

The following Quality Assurance measures will form the basis of the employer led approach under development:

- **The Independent Panel** assessment methods will produce assessment outcomes that are consistent and reliable, allowing fair and proper comparison between the evidence provided by Apprentices employed in different types and sizes of business and working with different ranges of equipment or applications in their day to day jobs and in different locations. This will include three different assessment methods each supported by standardised assessment and marking sheets for recording and assessing evidence. This will ensure that evidence is presented with consistency, and assesses knowledge, skills and behaviours applied in a variety of ways. Evidence from each Apprentice will be evaluated by at least three Assessors who will agree on a final majority decision so that consistency of judgements is ensured.
- **The Assessment Organisation** will be responsible for ensuring consistency of marking and evaluation by providing the standardised assessment and marking templates (ie workplace workbooks, knowledge examination materials, assessment forms) . It is recommended that assessment materials are developed alongside the professional institute in order that they align with EngTech registration requirements. Procedures for training and induction of the assessors, management of process of decision making, appeals procedures, managing conflicts and record keeping will be managed by the Awarding Organisation.
- **The Employer Occupational Brief** (Annex 1) provides further guidance to ensure consistency and maintain quality of assessment – including levels of independent verification and assessment of evidence provided.

SECTION C – Grading

- Apprenticeship Certificates will only be awarded to those who have achieved a pass in all three end point assessments and the mandatory qualification. This will demonstrate their ability to perform at the expected level within their existing job role, and that they have acquired the necessary knowledge, skills and behaviours to develop their career in the sector. Employers expect that where a candidate has shown exceptional achievement across several elements of the end point assessment, this should be reflected in the award in of a merit or distinction grade.
- The assessment grading will be based on:
 1. The results of the Knowledge Exam set and marked by the Awarding Organisation. This will account for one third of the final Apprenticeship mark. Pass marks for this test will be 60%. Results will be graded Pass (60 to 75%), Merit (76-85%) or Distinction (86-100%).
 2. The documented records of the Practical Project Assessment carried out by the Training Organisation. This will account for one third of the final Apprenticeship mark. Evidence from the Practical Project will be used to identify candidates who demonstrate Behaviours in practical applications, which exceed those specified in the Standard. This will be graded Pass, Merit or Distinction by the Independent Assessment Panel using a standardised marking sheet will be provided by the Awarding Organisation to ensure consistency and independence of assessment of grading.
 3. The contents of completed candidate Workplace Evidence Workbook verified by the Training Organisation. This will account for one third of the final Apprenticeship mark. Evidence from the Workbook will be used to identify candidates who demonstrate Behaviours in practical applications, which exceed those specified in the Standard. This will be graded Pass, Merit or Distinction by the Independent Assessment Panel using a standardised marking sheet provided by the Awarding Organisation to ensure consistency and independence of assessment of grading.
- Employers and Training organisations will not be part of the process for evaluating grading, which will be solely made by the Independent Assessment Panel.

- More details of the grading decision making are provided in the Employer Occupational Brief (Annex 1)

SECTION D – Implementation

Cost effectiveness of assessments

The cost of End Point Assessment is detailed in the Costing Plan. Total costs of delivery of the End Point assessment are likely to be 15% of the total cost of delivery including on programme training. The following cost elements have been taken into account:

1. On-programme training (practice and theory) and on-programme assessment by Training Organisations to regularly review Apprentice progress towards the end point Assessments. Mandatory qualifications require on line test of the candidate's knowledge and practical workshop assessments carried out to national standards set by existing Awarding Organisations. The workshop assessments require significant on-going investment in test equipment, materials, components and other consumables. Regular review and verification of Workplace Workbook
2. End Point Assessments will include the following costs by the Training Organisation
 - a) Carrying out of recommended gateway assessments
 - b) Carrying out and recording of supervised Practical assessments, which require significant on-going investment in test equipment, materials, components and other consumables.
 - c) Conducting of on line assessments for the Knowledge Exam
3. End Point Assessment will incur the following costs by the Assessment Organisation
 - a) Managing the Independent Assessment Panel (training, recruitment, on going costs, meetings, fees)
 - b) Quality assurance measures (employment of internal and external verification measures)
 - c) Development and provision of standardised templates for assessment and evidence recording
 - d) Development and administration of on line examinations

It is anticipated that approximately 500 individual apprenticeship will be taken up each year.

Deliverability of Final End Point Assessments

- Flexibility - sufficient flexibility has been built into the assessment plan to allow Apprentices from a range of specialisms, business size or geographical location, to undertake the end point assessments. For example templates for the Workplace Evidence Workbook will be standardised but will provide sufficient flexibility for candidates to record evidence tailored to reflect the scope of their work. (eg job sheets, photos, written descriptions). Assessments can be delivered at existing specialist Training facilities or using in-house or workplace assessment facilities. The assessment methods for knowledge, skills and behaviours will be applicable in any refrigeration, air conditioning or heat pump engineering technician work context. Employers will be able to establish their own on programme delivery facilities, to use work place facilities for practical assessments, and employ independent-training organisations to carry out assessments.
- Preparedness of Training Organisations- A national network of specialist Training Organisations is available, experienced at supervising practical and knowledge assessments to national standards, and verifying work place evidence, including internal and external verification procedures. In many cases suitably qualified staff are employed in delivering existing sector qualifications by the Training Organisations. The necessary workshop facilities and equipment such as test rigs, workshops, training equipment are available in many Training Organisation and Workplace locations.
- Formation and Management of the Independent Panel - The sector has ready access to a pool of subject competent persons representing Professional Institutes from whom the Assessment Organisation can draw to join the Independent Assessment Panel. Many of these have Engineering Council registration experience and are familiar with Engineering Technician requirements.

- Preparation of End Point Assessment Specifications - It is recommended that the following assessment materials are developed alongside the professional institute in order that they align with EngTech registration requirements:
 - a) Workplace Evidence Workbook contents
 - b) Specification for Practical Project test equipment
 - c) Knowledge Test question bank generation
 - d) Assessment templates for Training Organisations and Independent Panel
 - e) Recruitment, training and management of Independent Panel members and processes
- Preparation for on programme learning and assessment – A range of Training Organisations are currently delivering practical and knowledge based training and assessments in the RACHP sector (including the Mandatory Qualification).