

Building Services Engineering Ductwork Installer (level 2) – End Point Assessment

Introduction

Building Services Engineering makes buildings work. It is a specialist branch of engineering within the construction sector. Ductwork Installers work within new build construction sites and existing buildings including large industrial and commercial buildings such as office blocks, factories, schools, airports and hospitals. These systems provide clean air and/or remove used air, and move temperature controlled air around the inside of buildings as part of a building's ventilation and life safety systems. They work under close but not constant supervision in the most efficient and economical manner. They have a basic knowledge of the systems and how the components within systems relate to each other as well as being able to plan and undertake allocated work tasks to install system components; assist in pre-commission and de-commissioning.

This Assessment Plan has been designed to inform those involved in the delivery and assessment of the apprenticeship:

- **What** will be assessed
- **How** the apprentice will be assessed
- **Who** will carry out the assessment
- **Quality Assurance** arrangements to make sure that end-point assessments are reliable and consistent across different locations, and assessment organisations.

Summary of Assessment

The main objective of the building services engineering ductwork installer end point assessment is to provide a high quality cost effective means of measuring the apprentice's competence in the final three months of their apprenticeship.

The assessment plan design is driven by the following principles:

- The apprentice demonstrating competence as far as practical through workplace performance
- The apprentice's ability to meet specified apprenticeship standards of competent performance
- The apprentice's ability to demonstrate the requisite knowledge and behaviours that support workplace performance
- Identification of the apprentice's potential for progression

Installer apprentice end point assessment will contain two required components:

- Knowledge Test
- Observed Skills Test

The following diagram provides a summary of the End Point Assessment process

On Programme

- Structured programme of learning and assessment

Assessment Gateway

- Confirmation from Employer and Training Provider that the learner is ready to access the End Point Assessment, with the employer making the final decision
- Level 1 English and Mathematics qualifications achieved
- Level 2 English and Mathematics tests attempted

End Point Assessment

Assessments must be accessed in the order given – the apprentice must pass each assessment component before moving onto the next.

The Independent Assessment Organisation must be registered on the Register of Apprentice Assessment Organisations. It has overall responsibility for coordinating the End Point Assessment and for the final sign off of the apprenticeship as having been satisfactorily completed.

1. Knowledge Test

- Synoptic knowledge assessment, delivered as an on demand multiple choice examination
- Administered in an examination venue which is recognised by the Independent Assessment Organisation
- Designed, maintained and marked by Independent Assessment Organisation

2. Observed Skills Test

- Timed synoptic Observed Skills Test of the apprentice in the workplace or a suitable venue where simulation can take place
- Administered in the workplace
- Observed, marked and scored by an Independent Assessor on behalf of the Independent Assessment Organisation
- Must cover specified knowledge, skills and behaviours

Assessment Overview			
Assessment Method	Area Assessed	Assessed by	Grading
On-demand Knowledge Test	Underpinning and applied knowledge	Independent Assessment Organisation	Fail Pass Distinction
Observed Skills Test	Performance – application of skills, knowledge and behaviours	Independent Assessment Organisation through an Independent Assessor	Fail Pass Distinction

On Programme Assessment

- It is recommended that the apprentice receives basic health and safety induction prior to attending a work site. It is also recommended that Apprentices obtain a Trainee SKILLcard in order to gain access to most construction sites
- It is recommended that the apprentice completes a portfolio of work during the on-programme phase of the apprenticeship programme from all aspects of their training
- It is recommended that the apprentices progress is assessed regularly by:
 - the training provider using knowledge tests and practical assignments that provide a similar experience to the end-point assessment
 - The employer (supported by the training provider) reviewing the apprentice's work activities
- During the On Programme assessment all apprentices must:
 - achieve Level 1 English and Level 1 Mathematics qualifications
 - take the test for Level 2 English and Level 2 Mathematics

Assessment Gateway

- The Assessment Gateway allows the apprentice to access the End Point Assessment. This can only be accessed within the final three months of the apprenticeship.
- End Point Assessment is triggered by the employer, in conjunction with the training provider, who will decide if the learner has demonstrated the necessary knowledge, skills and behaviours during the On Programme Learning so that they are ready to access the End Point Assessment. The employer will make the final decision on the apprentice's readiness for end point assessment.

What is being assessed?

End Point Assessment

Assessment Method	Area Assessed	Assessed by
Knowledge Test	<p>Duration: 60 Minute Test (40 Questions)</p> <ul style="list-style-type: none"> • Fail (Less than 60% correct) • Pass (60% to 74%) • Distinction (75% or greater correct) <ul style="list-style-type: none"> • The Knowledge Test will use a multiple-choice questions format to assess underpinning applied knowledge in all elements of the standard. The underpinning questions will primarily cover the “how” and “why” elements of the content. Applied knowledge will use scenario type questions to assess the apprentice’s judgement and decision making • The test will comprise of 15 underpinning knowledge questions and 25 applied knowledge questions • Each multiple choice question will give a choice of four response options • The assessment will be synoptic of all areas identified in Annex A of this Assessment Plan to be tested by this method • This knowledge will be tested by the Assessment Organisation, through centrally set multiple choice on-demand examination • The examination venue must have been recognised by the Independent Assessment Organisation prior to the examination taking place. The examination venue must have access to appropriate resources to conduct the assessment such as appropriately trained invigilation staff. Alternatively, the examination may be administered by the Independent Assessor • An apprentice achieving a Fail grade may attempt the Knowledge Test on one further occasion. The maximum grade of Pass will be awarded for achievement of 60% or greater, unless the Independent Assessment Organisation determines there are exceptional circumstances accounting for the fail. Apprentices not achieving a Pass after the second attempt will be required to undertake a professional review of performance with their employer and training provider which will include a period of additional training on identified areas of underperformance 	<p>Assessed by: Independent Assessment Organisation</p> <p>Grading: Fail Pass Distinction</p>
Assessment Method	Area Assessed	Assessed by
Observed Skills Test	<p>Duration: 8 hours</p> <ul style="list-style-type: none"> • This end point test will be used to confirm that the apprentice can work safely and contribute to the planning, installation, testing, maintenance, fault diagnosis and repair of the ductwork installation, to the specified standards, within a stated timescale • The assessment will take between 6 and 8 hours to complete. It will 	<p>Assessed by: Independent Assessment Organisation</p> <p>Grading:</p>

	<p>normally take place at the employer’s workplace. Alternatively, the assessment may take place away from the workplace, in a location which simulates a real working environment and conditions</p> <ul style="list-style-type: none"> • The assessment location must be approved by the Assessment Organisation prior to the assessment taking place. • Apprentices will be assessed through observation during the task by the Independent Assessor, who is a representative of the Independent Assessment Organisation • The Observed Skills Test must cover the areas identified in Annex A, including the following elements: Part A – Preparation of the work area from a drawing, to ensure the task can be undertaken safely and effectively and to ensure all necessary resources are available and to hand Part B – First Fix; working from setting out datum points, bracketing, installation of ductwork with ancillaries Part C – Testing and Fault Rectification; testing fire dampers and volume control dampers for correct operation and rectifying fire damper closure faults • The Observed skills test will also allow the Independent Assessor to assess the apprentice’s behaviours ensuring these are in line with the recognised standard. The Independent Assessor will interact with the apprentice either during or at the end of the observed skills test. This allows the Independent Assessor to question the apprentice further around how and why they have carried out the task in the way they have. This will allow all of the behaviours identified in Annex A to be assessed communicating effectively <ul style="list-style-type: none"> - working effectively and efficiently - taking responsibility - working with others - continuing personal development - working ethically • The Independent Assessor will grade the apprentice against following grading criteria 	Fail Pass Distinction
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Key factors	Fail	Pass	Distinction
	The apprentice is unable to:	The apprentice has:	The apprentice meets all Pass criteria and has:
Planning and Preparation	<ul style="list-style-type: none"> • demonstrate a clear understanding of the installation drawing, • Identify the correct resources for the installation, • work in accordance with 	<ul style="list-style-type: none"> • interpreted the drawing correctly, • identified the correct resources required for the installation, • interpreted correctly and established the 	<ul style="list-style-type: none"> • demonstrated the ability to consistently organise and sequence tasks for efficient and effective assembly and installation

	the risk assessment and method statement	requirements of the risk assessment and method statements	
Completion	<ul style="list-style-type: none"> complete the task of assembly and installing ductwork within the allocated time or to the expected industry accepted standard (DW144) 	<ul style="list-style-type: none"> completed the task of assembly and installing ductwork and testing the installation within the allocated time frame and industry accepted standard (DW144) 	<ul style="list-style-type: none"> demonstrated the ability to carry out the work in a systematic, effective and efficient way
Accuracy and Presentation	<ul style="list-style-type: none"> use tools and ductwork materials appropriately resulting in an unstable assembly and damage to the working area and materials used fails to install to an industry accepted standard (DW144) . 	<ul style="list-style-type: none"> produced an assembly and installation without damage to the components fixed the assembly securely with suitable use of brackets assembled and installed ductwork to industry accepted standard (DW144), specifications and codes of practice 	<ul style="list-style-type: none"> produced an assembly and installation that is snag free completed the task without requesting further materials due to error or miscalculations
Working safely	<ul style="list-style-type: none"> demonstrate safe working practices and does not use the appropriate PPE throughout the task 	<ul style="list-style-type: none"> worked safely in accordance with health and safety procedures maintained a safe and clear working environment for the duration of the task 	<p><i>Apprentices must meet the Pass criteria. There is no additional criteria for distinction in the area of safety</i></p>
	<p>Apprentices receiving a grade of Fail and their employers will receive a debrief from the Independent Assessor. The apprentice must then retake the Observed Skills Test within six months. The maximum grade available to them will be a Pass, unless the Independent Assessment Organisation determines there are exceptional circumstances accounting for the fail. Apprentices not achieving a Pass after the second attempt will be required to undertake a professional review of performance with their employer and training provider. This will include a period of additional training on identified areas of underperformance. This period of training should not exceed three months</p>		

- The employer, in conjunction with the training provider, will decide if the learner has demonstrated the necessary knowledge, skills and behaviours during the On Programme Learning so that they are ready to access the End Point Assessment
- The employer will then make arrangements with the Independent Assessment Organisation for the End Point Assessment to take place
- The apprentice will then attempt, in the following sequence:
 - Knowledge test
 - Observed Skills Test
- The apprentice will be provided with results of the knowledge test before attempting the Observed Skills Test
- The Knowledge Test may be undertaken on the same day as the Observed Skills Test

Minimum requirements for Independent Assessors

- Independent Assessors must be occupationally competent and competent to assess. The requirements for these are as follows:
 - Occupational competence – is recognised within the industry as a Ductwork Installer craftsperson holding an NVQ or SVQ level 3, Gold Engineering Services SKILLcard or equivalents or suitable experience.
 - Competence to assess – must be working towards or have achieved a relevant recognised assessor qualification such as a Level 3 Certificate in Assessing Vocational Achievement and continue to practice to that standard. Assessors who hold earlier qualifications (D32 or D33 or A1, or TQFE/TQSE) should have CPD evidence to the most current standards

End Point – Final Judgement

- The Independent Assessment Organisation, informed by the Independent Assessor, makes the judgement on whether the apprentice has passed the End Point Assessment or not, this decision is based upon the results of the Knowledge Test and Observed Skills Test. The Independent Assessment Organisation will also provide the overall apprenticeship grading based on the apprentices combined results from the Knowledge Test and Observed Skills Test
- The Independent Assessor will provide a report and grading outcomes to the Independent Assessment Organisation, who will issue the result to the apprentice, their employer and training provider
- The Independent Assessment Organisation is responsible for allocating the overall apprenticeship grading and making the final decision on apprenticeship completion

End Point Grading

- To achieve a Pass, the apprentice must achieve at least a Pass in both components (the Knowledge Test, Observed Skills Test)
- A Distinction will be awarded only if the apprentice achieves all the requirements of a Pass and is graded Distinction in both the Knowledge Test *and* the Observed Skills Test

Re-sits

- Where an apprentice fails any component of the end point assessment, the maximum grade for any re-sit is a Pass, unless the Independent Assessment Organisation determines there are exceptional circumstances accounting for the fail. For this reason it is important that apprentices are not entered for

the end assessment until the employer and training provider feel the apprentice is ready for the End Point Assessment

Independence

- Independence is provided to the Installer apprenticeship by:
 - the multiple choice Knowledge Test being centrally set and maintained by the Independent Assessment Organisation
 - the End Point Assessment being co-ordinated by the Independent Assessment Organisation
 - the Independent Assessment Organisation being responsible for the overall decision on apprenticeship completion, with input from the Independent Assessor
 - the Observed Skills Test being observed and marked by the Independent Assessor
 - the Independent Assessment Organisation being responsible for the grading of the apprenticeship

Roles in Pre End-Point Assessment

Training Provider	<ul style="list-style-type: none"> • delivers and assesses on-programme learning • works with the employer to plan and continuously monitor the apprentice's progress, address any gaps in learning or experience and to ensure work is completed to a high standard for End Point Assessment • supports the employer in deciding the timing of and arranging the End Point Assessment • provides the apprentice with training in the end point assessment process • supports the employer in implementing remedial action required by the apprentice before re-sitting any unsuccessful component/s
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Roles in End-Point Assessment / Gateway

Apprentices Employer	<ul style="list-style-type: none"> • Contributes to the assessment gateway by observing and authenticating the workplace evidence to substantiate that it is authentic and meets industry standards • Decides on the timing of and makes arrangements for any on programme and End Point Assessment, with the support of the training provider, as required • Ensures the apprentice has the necessary documentation for End Point Assessment • Works with the training provider to agree remedial action required by the apprentice before re-sitting any unsuccessful component/s
Independent Assessor	<ul style="list-style-type: none"> • Administers the end-point assessment • Observes and marks the Observed Skills Test • Informs the Independent Assessment Organisation of the mark and grades the apprentice has achieved in the End Point Assessment • Participates in at least two annual standardisation events which will be arranged by the Independent Assessment Organisation
Independent Assessment Organisation	<ul style="list-style-type: none"> • Is registered on the Register of Apprentice Assessment Organisations • Approves and maintain a network of training provider assessment centres • Provides independent assessment of knowledge by centrally setting and marking online multiple choice examinations • Provides and manages Independent Assessors to administer the End Point Assessment • Provide documentation, training and support for Independent Assessors to ensure rigour and consistency

Quality Assurance (Internal)

- Quality assurance of End Point Assessment is provided by the Independent Assessment Organisation who will:
 - Enforce criteria for approved assessment centres by defining the staff, resources, processes and procedures required to undertake the Knowledge Test and Observed Skills Test
 - Provide and manage a network of Independent Assessors to undertake assessment of the Observed Skills Test
 - Develop, manage and maintain on-demand multiple choice examinations to test the knowledge of apprentices
- Independent Assessment Organisations will provide documentation, training and support for independent assessors to ensure rigour and consistency
- The independent assessors will attend at least two meetings per year, arranged and managed by the Independent Assessment Organisations. The purpose of these meetings will be:
 - to improve consistency and rigour in the approach and execution of their assessment responsibilities
 - to ensure that where any technical or assessment variation (or scope for variation) is identified, a standard interpretation is established and applied.
- Multiple choice examinations will be formulated, reviewed and moderated by the Independent Assessment Organisation to meet the Assessment Plan

Quality Assurance (External)

- The employer group will utilise the Institute for Apprenticeships to undertake external quality assurance for this apprenticeship

Implementation of End-Point Assessment

Affordability:

- The percentage proportion of end point assessment against the overall cost of the apprenticeship is 7.6%

Consistency

Volumes:

- Based on previous apprenticeship training patterns it is expected that there will be an intake of 50 -100 Craftsperson apprentices each year

Capacity:

- There are currently 2 providers delivering craftsperson apprenticeships throughout England for employers to choose from
- These training providers are experienced in the delivery of training, administering knowledge tests within this occupation
- They give varying levels of support dependent on the needs of the employer
- They are also able to operate in a flexible way to meet the needs of larger businesses who normally have well developed training, mentoring and monitoring processes in place, but can also meet the needs of smaller businesses where more direct support is required to help structure work experience, provide mentoring and monitoring the apprentice's progress
- The judgement of apprenticeship completion being provided to the Independent Assessment Organisation and by an Independent Assessor, brings an appropriate cost effective enhancement to the process for this level of apprenticeship

Annex

- Annex A shows which method/s of assessment cover each element of the Apprenticeship Standard

Assessment Method Identification

This chart provides an overview of what an apprentice can expect to be covered in each assessment method

Key to assessment method identification within tables:

IEA Independent End Assessment activity – identifies which assessment method will be used for that section of the standard.

T Assessment will be through the on demand Knowledge test

O Assessment will be through the Observed Skills Test

Some sections of the standard are assessed by more than one method

Knowledge		IEA	
		T	O
Working Safely	Safe working practices applying to themselves and others	✓	✓
Ductwork principles	Basic operating principles underpinning ductwork systems including relevant specifications e.g. measurement and pressure classification and materials	✓	✓
	The need for ductwork system cleanliness during the installation process.	✓	✓
Working Sustainably	Environmental protection measures associated with ductwork installation in regards to effective use of material resources and waste management	✓	✓
Preparing	How to prepare work areas to undertake allocated ductwork installation	✓	✓
Installing Ductwork Systems	The installation, assembly, positioning, fitting, pre-commissioning, de-commissioning and preparing for testing techniques and processes for ductwork systems, and associated plant and equipment	✓	✓
	Rectangular, circular and flat oval, plastic, fire-rated, air handling units and local exhaust ventilation ductwork system components	✓	✓
	How components relate to each other within ductwork systems	✓	✓
Skills		IEA	
		T	O
Working Safely	Apply relevant safety legislation, codes of practice and safe working practices to self and others in building services engineering working environments		✓
Preparing and Working Sustainably	Prepare work areas in new and existing sites to undertake allocated ductwork component installation work tasks		✓
	Undertake the installation of system components in ways which use resources efficiently, to complete allocated work tasks effectively, safely and with consideration to environmental impact using industry recognised standards		✓
Installing Ductwork Systems	Apply installation, assembly, positioning, fitting and pre-testing techniques on; rectangular, circular and flat oval, air handling unit, fire-rated and local exhaust ventilation ductwork system components, to industry recognised standards		✓
	Undertake allocated work tasks in the pre/decommissioning of ductwork systems		✓

Problem solving	Solve problems within their scope of responsibility		✓
	Identify, evaluate and report problems through the application of technical skills and knowledge		✓
Behaviours		IEA	
		T	O
Communicating Effectively	Use oral, written and electronic methods to communicate information with work colleagues, other tradespeople, clients' representatives, supervisors, and other members of the building services engineering and wider construction team.		✓
Working Effectively and Efficiently	Work reliably and effectively under close, but not constant supervision to the appropriate industry recognised practices and be aware of the needs and concerns of others, especially where related to diversity and equality.		✓
	Represent self and company in an appropriate manner.		✓
Taking Responsibility	Accept responsibility for their own work.		✓
Working with Others	Work effectively with colleagues, other tradespeople, clients, suppliers and the public.		✓
Continuing Personal Development	Maintain and enhance competence in own area.		✓
Working Ethically	Exercise responsibilities in an ethical manner.		✓