

Engineering Fitter

Level 3 Apprenticeship Standard (ST0432)

Specification



This guide describes the different types of End-Point Assessment tests, the test rules and who should be involved. Preparing for End-Point Assessment and working with SIAS are also covered.

SIAS is the science industry assessment service. It is part of the Cogent Skills Group. For further information about apprenticeship standards and Trailblazers please contact info@siasuk.com.

Version History

Version	Updates
1.1	Amend to gateway requirements (mandatory qualification) following assessment plan update.

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Qualification Objective

The aim of this qualification is to ensure that the apprentice is occupationally competent against the knowledge, skills and behaviours (KSBs) outlined in the assessment plan for this standard.

This occupation is found in manufacturing and process sectors.

The broad purpose of the occupation is to produce complex high value, low volume components or assemblies in full or part, using machines, equipment, or systems, to the required specification. For example, turbines, cranes, gearboxes, production lines, rigs, and platforms.

Fitters may typically have a mechanical, electrical, electronic, control systems, pipe fitting or instrumentation bias. To produce or re-furbish the components fitters will interpret drawings or specifications and plan their work, for example ensuring they have the right tools, equipment, and resources to complete the task to the required specification. Fitters are required to check their work against quality standards and make adjustments as required based on their knowledge. On completion of the task a fitter will hand over the product and prepare the work area for the next task by checking equipment meets the standards required to operate. They may be based in a workshop or clients' premises - this may include hazardous environments.

In their daily work, an employee in this occupation typically interacts with line managers or supervisors; depending on the size of the employer and nature of the work they may work as part of a team of fitters or independently. They may interact with personnel in other functions for example installation and maintenance engineers, health and safety, and quality assurance personnel, as well as internal or external customers.

An employee in this occupation will be responsible for completion of their work to the required specification and deadlines, in line with quality, health and safety and environmental regulations and requirements, with minimum supervision.

Prior Learning and Qualifications

There are no statutory, regulatory or other typical entry requirements.

Overview

Full time apprentices will typically spend 42 months on-programme working towards the occupational standard. All apprentices must spend a minimum of 12 months on-programme. Apprentices must complete the required amount of off-the-job training specified by the apprenticeship funding rules.

The End-Point Assessment (EPA) should only start once the pre-requisite gateway requirements for EPA have been met and that they can be evidenced to SIAS. The employer must be satisfied that the apprentice is consistently working at or above the level set out in the occupational standard. Apprentices must have demonstrated competence to operate safely in a fitting environment and achieved Advanced Manufacturing Engineering Diploma. The employer must have agreed a project activity with SIAS; it should be relevant to the apprentice's workplace.

In addition, apprentices without English and mathematics at level 2 must achieve English and mathematics qualifications in line with the apprenticeship funding rules.

The EPA period will typically be within 4 months after the apprentice has met the EPA gateway requirements.

Performance in the EPA will determine the apprenticeship grade of:

- fail
- pass
- distinction

Competence Evaluation

During the apprenticeship, regular evaluation of the competence of the apprentice against the apprenticeship standard will help to ensure that they achieve full occupational competence by the end of their training, and they are ready for EPA. Confirmation from the employer that the apprentice is fully competent is needed before EPA can take place.

As competence evaluation is an in-programme activity, the process that is used for this has not been mandated. It is for the employer supported by their training provider to decide how they wish to do this. To help with this SIAS has produced the SIAS Competence Tracker.

Gateway Requirements

The EPA must only start once the employer is satisfied that the apprentice is consistently working at or above the level set out in the occupational standard, that means they have achieved occupational competence. In making this decision, the employer may take advice from the apprentice's training provider(s), but the decision must ultimately be made solely by the employer.

In addition to the employer's confirmation that the apprentice is working at or above the level in the occupational standard, the following gateway requirements must be met prior to the apprentice starting the EPA:

- achieved English and mathematics qualification in line with the apprenticeship funding rules
- demonstrated competence to operate safely in a fitting environment
- achieved an Advanced Manufacturing Engineering Diploma:
 - EAL Level 3 Diploma in Advanced Manufacturing Engineering (Development Knowledge)
 - Pearson BTEC Level 3 Diploma in Advanced Manufacturing Engineering (Development Technical Knowledge)
 - City & Guilds Level 3 Diploma in Advanced Manufacturing Engineering (Development Knowledge)
- submission of completed portfolio of evidence authenticated by employer
- employer agreed project activity agreed with SIAS, it should be relevant to the apprentice's workplace

The project should allow the opportunity to cover the KSBs assigned to this method of assessment and the following should be discussed and agreed at the gateway as a minimum:

1. Background
2. Outline of the issue or opportunity
3. Justification for the project
4. Consideration of legislation, regulation, industry and organisational policies, procedures, and requirements
5. Proposed plan for implementation
6. Measures of success.

Assessment Methods

Apprentices must complete:

1. Project: report including evidence, and questioning
2. Multiple choice test
3. Professional discussion supported by a portfolio of evidence

Assessment Method 1 - Project: Report including Evidence, and Questioning

The purpose of the project is to assess the apprentice's knowledge, skills and behaviours (KSBs) in a way that closely relates to their day-to-day responsibilities. Apprentices must conduct a project based on an engineering fitter activity undertaken during their EPA period, relevant to their workplace and under the supervision of a technical expert from their employer. Following the activity, the apprentice must compile a report. The report must contain evidence from the completed activity as annexes. The end-point assessor will question the apprentices about the content of the report and evidence. The end-point assessor must assess the report and evidence and questioning components holistically to determine the grade for this assessment method.

The employer must ensure the apprentice has sufficient time and the necessary resources, within their EPA period, to plan and undertake the project activity, compile the report and evidence; and to undertake the questioning.

Project activity

The apprentice's employer must agree the project activity with SIAS, and the project activity should take typically 4 weeks to complete; it should be relevant to the apprentice's workplace. It must enable demonstration of the KSBs in an integrated way and requires:

- Complying with legislative and company health, safety, and environmental processes.
- Use of risk assessment process, procedures, and documentation.
- Interpretation of the project brief.
- Planning and preparing to produce the component or assembly.
- Selection of the correct tools for the process to be performed.

- The production of a component or part of a component using different techniques and equipment.
- Adhering to quality criteria to ensure component or assembly meets specification.
- Handover of completed component or assembly.

For example, a project could be based on:

- the assembly of a section of plant, equipment, or tooling such as conveyors, machinery, portable tooling, turbine, etc
- fitting of a gearbox, conveyors, pumps, motor, heaters, etc
- installation of sensors, switches, motors, pumps, machines, etc
- producing component parts such as keys, pipework, wiring looms, mating parts, etc
- dismantling or refurbishment of motors, pumps, gearboxes, conveyors, rigs, cranes, machinery, packaging equipment, etc

The activity may take place in the employer's premises or their clients as appropriate. SIAS is responsible for ensuring the EPA environment is representative of the apprentice's workplace and can facilitate the EPA. The apprentice should be familiar with the tools and equipment required to undertake the activity and normal working conditions must apply.

The apprentice must conduct the activity under the supervision of a technical expert from the apprentice's employer. The technical expert must provide the apprentice with the project activity specification and any work instructions in writing and verbally prior to the activity starting, following SIAS's guidelines. Apart from this verbal briefing, the technical expert must not discuss the activity or provide guidance to the apprentice during the activity. After completion of the activity the technical expert must provide a factual account to SIAS within 10 working days, using SIAS's documentation, confirming:

- exactly what the apprentice did and how they did it (presented in steps)
- whether the task was completed in full or part
- whether the task was completed to the required specification or work instructions in full or part
- that the apprentice completed the task unaided

Report including evidence component

Apprentices must produce a report detailing how the project was completed, the activity including equipment and resources required, problems that were encountered and how they were overcome, checking, fault rectification and handover procedures. As a minimum, the report should include:

1. Background
2. Project brief detailing targets
3. Project plan
4. Implementation – how targets were achieved
5. Risk analysis
6. Challenges faced
7. Project outcomes

8. Annexes

The report must be 2000 words with a 10% tolerance above or below, excluding annexes.

Evidence relating to the project activity must be referenced in the report and included as annexes. Evidence could include:

- Project or work plan
- working notes
- work records
- video clips (maximum 15 minutes in total)
- annotated photographs of completed work or work in progress
- diagrams
- job write up
- calculations
- fault diagnosis records
- data reports
- build specifications
- quality or compliance records

This list is not exhaustive and other evidence sources are permissible. However, self-reflective accounts and witness testimonies are not valid evidence sources. There must be 8-10 pieces of evidence – the focus must be on quality not quantity. Within the annexes there must be a mapping of the annex evidence against the KSBs being assessed by this assessment method and a statement from the technical expert confirming that the report and evidence is the apprentice's own work and authenticating the project outcomes. It is expected that each piece of evidence will cover multiple KSBs.

The project report, including evidence in annexes must be submitted to SIAS within two weeks of the apprentice completing the project activity.

In certain circumstances, depending on the nature of the business or department where the apprentice is employed, the evidence or documentation may not be allowed to leave the premises and in certain cases the information in the evidence may be required to be redacted for confidentiality reasons. Should the evidence not be allowed to leave the premises the end-point assessor must review the project report at the employer's premises within 2 weeks of the task being completed. SIAS and their end-point assessors may also be required to sign a confidentiality or non-disclosure agreement with the apprentice's employer.

The apprentice's end-point assessor must review the report and annexes ahead of the questioning component.

Questioning component

Apprentices must have two weeks' notice of the date for the questioning.

The end-point assessor must conduct the questioning component on a one-to-one basis with the apprentice.

They must be conducted under controlled conditions, that is in a quiet room free from distractions and influence. It is expected that SIAS will use the apprentice's employers or training provider's premises for the questioning component to minimise costs however, other venues may be sourced if necessary. They may be completed remotely using videoconferencing facilities. SIAS must ensure appropriate methods to prevent misrepresentation, for example 360-degree camera function with the end-point assessor where the questioning is completed remotely. SIAS must verify the suitability of the venue and the identity of the person taking the test.

The purpose of the questioning is to allow the end-point assessor to question the apprentice in relation to the project activity, report including evidence, to check authenticity of the work and assess the apprentice's depth of understanding and those KSBs that are assigned to this component that did not occur naturally during the project activity. Apprentices may refer to their project report and evidence when answering the questions.

End-point assessors must ask apprentices 10 open questions; follow up questions are allowed to seek clarification. End-point assessors must devise the questions based on the review of the project report and evidence. SIAS must develop a sample question bank to aide end-point assessors; however, they may need to tailor these questions based on the evidence presented.

Questioning must last 60 minutes, plus 10% at the end-point assessor's discretion.

The questioning should be recorded electronically, subject to the apprentice's agreement; where permission is not given it is permissible for another end-point assessor to be present to document evidence presented.

Project: Report including Evidence, and Questioning Grading Descriptors

KSBS	Pass Apprentices must achieve all Pass criteria	Distinction Apprentices must achieve all Pass criteria and all Distinction criteria
Documentation - Interpretation and Use K9 K10 S1 S10	<p>P1 Reads, correctly interprets, and understands the documentation related to the project and know how to use them e.g., completes the required tasks in line with the documentation requirements.</p> <p>P2 Demonstrates the knowledge to correctly complete the component or assembly documentation, e.g., documentation is completed in full, legibly, and accurately at the right time during work activity.</p> <p>P3 Demonstrates an understanding of the reasons why the documents need to be completed.</p>	N/A

KSBs	Pass Apprentices must achieve all Pass criteria	Distinction Apprentices must achieve all Pass criteria and all Distinction criteria
	P4 Demonstrates an understanding of quality standards for components or assembly and how they have ensured they are met and have been measured; for example, how they have applied ISO9001 in the workplace.	
Assembly K3 K4 K14 K15 S2 S3 S4 S5 S6 S12	P5 Plans and prepares the project appropriately for successful completion, for example, ensures the specified materials, tools and equipment are available for the build and they are in a usable condition. P6 Uses the appropriate manufacturing or assembly processes for the project to be performed. Selects the correct tools for the project and uses them safely e.g. carries out checks, measurements and calibration activities following procedures and processes. P7 Complies with internal quality processes and procedures to ensure component or assembly meets specification and understands methods to be used if problems occur. P8 Uses the correct techniques to accurately and economically produce the component or assembly. P9 Restores the work area on completion of the activity.	D1 Demonstrates the knowledge and skills to plan and prepare to complete a task to the required standard with limited supervision. D2 Demonstrates they understand the importance of adhering to the quality criteria and where they have not only complied with internal quality processes and procedures but made suggestions to improve the processes and procedures, to produce components that meet specification, for example have developed processes to improve either internal or supplier performance.

Fail – An apprentice will fail where they do not demonstrate all the pass descriptors.

Project: Report including Evidence, and Questioning Knowledge, Skills and Behaviours

Ref	Grading descriptor
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Knowledge	
K3	Manufacturing and assembly processes for example, filing, sawing, scraping, drilling, soldering, bolting, wire cutting, threading, etc.
K4	Safe use of tools and equipment (hand and power tools); right tool for the job, requirements for machinery checks, adjustments, operation and shut down.
K9	Component or assembly documentation. For example, bill of materials, standard operating procedures, inspection records, assembly instructions, electrical, pneumatic, hydraulic circuit diagrams. What they are and how to interpret and use.
K10	Quality standards for components or assembly for example, drawing, calibration of equipment, materials specification. How to ensure they have been met and assured. Application of ISO9001 (Quality Management Standard) in the workplace.
K14	Planning techniques – resources, tools, equipment, people; time management.
K15	Component or assembly quality checks for example, checking tolerances, threads, voltages. Types of faults that occur and problem-solving techniques, for example, cause and effect, 5 Whys, flow process analysis etc.
Skills	
S1	Reading, interpreting, and understanding the component or assembly specification, diagrams, drawings and work instructions.
S2	Planning component or assembly task – materials, tools and equipment.
S3	Preparing work area for component or assembly task; sourcing required resources, tools and equipment.
S4	Carry out relevant planning and preparation activities before commencing work activity and know how to source required resources and interpret detailed drawings, specifications and job instructions.
S5	Checking tools during and after task completion; identifying and reporting defects.
S6	Measuring and testing, checking and inspecting component or assembly for example, use of micrometers, verniers, multimeters, voltmeter.
S10	Completing component or assembly documentation for example job instructions, drawings, quality control documentation.
S12	Restoring the work area on completion of the activity; returning any resources and consumables to the appropriate location and housekeeping.

Assessment Method 2 - Multiple-Choice Test

The purpose of the multiple-choice test is to assess the apprentice's depth of understanding in the knowledge elements that may not naturally occur during the project and report.

The multiple-choice test will usually be computer based and taken on-line; a paper-based version will be available if required.

It will consist of 30 multiple choice questions. The questions must relate to the underpinning knowledge and must be varied.

Apprentices must choose one correct answer from a choice of four:

- A correct response will be assigned one mark.

- Any incorrect or missing answers must be assigned zero marks

Apprentices must get an overall minimum score of 18 to pass the multiple-choice test.

Apprentices must get 5 of the 6 health and safety questions (K11) correct and if they do not the test result will be fail. In addition to the health and safety questions the apprentice must get 13 marks from the remaining knowledge statements, a minimum of 3 marks for K1; a minimum of 4 marks for K4; a minimum of 3 marks for K6; a minimum of 3 marks for K7.

- Six questions must assess knowledge statement K1: Materials used in components or assemblies, for example, mild steel, aluminium, composites, copper etc. Their use and application considerations, for example machinability, hardness, conductivity, cost, availability, compatibility.
- Six questions must assess the knowledge statement K4: Safe use of tools and equipment (hand and power tools); right tool for the job, requirements for machinery checks, adjustments, operation and shut down.
- Six questions must assess the knowledge statement K6: Techniques for measuring, marking, cutting and drilling materials to the required size and shape, accurately, safely and economically during manufacturing processes.
- Six questions must assess knowledge statement K7: Engineering mathematical and scientific principles; methods, techniques, graphical expressions, symbols, formulae and calculations, and require apprentices to conduct calculations or analyse diagrams.
- Six questions must relate to the knowledge statement K11: Health and safety, including Health and Safety at Work Act, Personal Protective Equipment (PPE), manual handling, Control of Substances Hazardous to Health (COSHH), Provision and Use of Work Equipment Regulations (PUWER), Noise at Work Regulations, Electricity at Work regulations, risk assessments; how they must be applied in the workplace.

Apprentices must have a maximum of 60 minutes to complete the multiple-choice test (unless SIAS accepts special arrangements for that apprentice based, for example, on an official education or health plan).

The multiple-choice test is closed book i.e., the apprentice cannot refer to reference books or materials but will be allowed the use of a calculator to conduct any calculations.

Apprentices must take the multiple-choice test in a suitably controlled environment, that is quiet space, free of distractions and influence, and must be taken in the presence of an invigilator who is the responsibility of SIAS. Multiple choice tests may be taken in person or remotely. There must be no more than 15 apprentices to a single invigilator if in person, or one-to-five if remote. SIAS must ensure appropriate methods to prevent misrepresentation, for example, screen share and 360-degree camera function with an administrator or invigilator where the test is taken remotely.

SIAS must verify the suitability of the venue for taking the test and the identity of the person taking the test.

It is expected that SIAS will use the apprentice's employer's or training provider's premises for the knowledge test to minimise costs however, other venues may be sourced if necessary. SIAS must verify the suitability of the venue and the identity of the person taking the test.

The test will usually be taken online and be automatically marked, unless specific assessment needs have been identified, requiring alternative methods to be used, such as a paper-based test.

Multiple-Choice Test Grading Boundaries

Grade	Marks out of 30	Additional Information
Fail	0 – 17	Does not meet the requirements for a pass.
Pass	18 – 30	<p>The following must also be achieved:</p> <ul style="list-style-type: none">• a minimum of 3 marks for K1• a minimum of 4 marks for K4• a minimum of 3 marks for K6• a minimum of 3 marks for K7• a minimum of 5 marks for K11

Multiple-Choice Test Knowledge, Skills and Behaviours

Ref	Grading descriptor
Knowledge	
K1	Materials used in components or assemblies, for example, mild steel, aluminium, composites, copper etc. Their use and application considerations, for example machinability, hardness, conductivity, cost, availability, compatibility.
K4	Safe use of tools and equipment (hand and power tools); right tool for the job, requirements for machinery checks, adjustments, operation and shut down.
K6	Techniques for measuring, marking, cutting, and drilling materials to the required size and shape, accurately, safely, and economically during manufacturing processes.
K7	Engineering mathematical and scientific principles; methods, techniques, graphical expressions, symbols, formulae, and calculations.
K11	Health and safety, including Health and Safety at Work Act, Personal Protective Equipment (PPE), manual handling, Control of Substances Hazardous to Health (COSHH), Provision and Use of Work Equipment Regulations (PUWER), Noise at Work Regulations, Electricity at Work regulations, risk assessments; how they must be applied in the workplace.

Assessment Method 3 - Professional Discussion

The purpose of the professional discussion is to determine the extent to which the apprentice understands the requirements of their role as defined by the standard and to explore them through discussion.

The professional discussion (supported by a portfolio of evidence) shall be a face-to-face or virtual session involving the apprentice and the end-point assessor. The portfolio will be used as a source of evidence by which apprentices can exemplify their responses to questions asked by the end-point assessor. Modern communication software applications may be used but it is the responsibility of SIAS to ensure the application and the infrastructures are fit for purpose so as not to disadvantage the apprentice whilst assuring quality and standardisation are not compromised.

The apprentice will achieve a grade for this component of the EPA that will contribute towards the overall apprenticeship grading award.

Behaviours and knowledge mapped in the assessment plan shall be assessed using this professional discussion (supported by a portfolio of evidence) and the outcome shall be graded as fail, pass or distinction.

The professional discussion will be supported by a mandatory portfolio of evidence completed on programme. The portfolio itself will not be assessed but will be used by the end-point assessor to prepare the questioning for the professional discussion and by the apprentice to exemplify their responses to the questions.

Key facts:

- 1 to 1 discussion with end-point assessor.
- The professional discussion will assess the KSBs as specified in the assessment plan.
- The professional discussion shall be supported by a portfolio of evidence.
- The portfolio of evidence shall be uploaded at the gateway submission.
- The professional discussion shall last 60 minutes, and the end-point assessor will have the discretion to increase the time of the discussion by up to 10% to allow the apprentice to complete this method of the EPA.
- The professional discussion shall be carried out by an independent end-point assessor appointed by SIAS.
- The discussion shall take place in an environment which is free from interruptions.

Prior to the assessment the apprentice shall be given suitable notice, not less than 5 working days, to provide preparation time (for example to make travel arrangements if necessary).

End-point assessors must ask apprentices 8 questions, from a question bank prepared by SIAS, covering underpinning knowledge and behaviours as specified in the assessment plan. Supplementary questions are allowed to seek clarification. Questioning is expected to accommodate the type of engineering fitting that the apprentice does and the environment in which they work.

The end-point assessor must:

- Plan the professional discussion (supported by the portfolio of evidence) prior to it taking place and ensure that it is relevant to the standard.

- Ensure that the apprentice understands the process, the possible outcomes and how it is graded.
- Ensure they take steps to put the apprentice at ease.
- Ensure the apprentice has the grading criteria and relevant documentation to hand before commencing the professional discussion (supported by a portfolio of evidence).
- Complete the relevant documentation prepared by the SIAS, taking notes of what is said.
- Ensure that the outcome of assessment is notified to SIAS within the timescale set by SIAS.
- Ensure any special needs highlighted by the employer and training provider are taken into consideration in line with the Reasonable Adjustments policy.

Portfolio of Evidence requirements

On commencement of the apprenticeship, the apprentice must begin to retain a portfolio of evidence which must be finalised before passing through the gateway.

A completed portfolio of evidence is a compulsory EPA gateway requirement that supports the EPA Professional Discussion component.

Employers or training providers are free to devise their own version of the portfolio of evidence, but the portfolio of evidence must contain the following information:

- The name of the apprentice.
- Details of the apprentice's workplace.
- Evidence to support the knowledge, skills and behaviours of the apprenticeship standard that are mapped to the Professional Discussion assessment method. Each of these knowledge skills and behaviour statements must be evidenced three times (evidence can be provided through a range of sources, for example work reviews, department feedback) and mapped to the relevant KSBs. Each piece of evidence will cover multiple KSBs.
- Confirmation from the employer that the tasks evidenced in the portfolio were completed to the required standard of the organisation.
- Document the off-the-job training that has taken place during the on-programme phase, with at least 20% of their employed time off-the-job.
- Copy of English and mathematics certificates

The apprentice's employer must sign-off the portfolio of evidence, thereby confirming the demonstration of competence against the KSBs assigned to this assessment component and authenticating its contents.

The apprentice must submit their portfolio of evidence to SIAS when applying for the EPA. An end-point assessor will check qualification outcomes and review the portfolio to glean personalised information that will assist the professional discussion component of the EPA.

Professional Discussion Grading Descriptors

KSBS	Pass Apprentices must achieve all Pass criteria	Distinction Apprentices must achieve all Pass criteria and all Distinction criteria
Health, Safety and Environmental K11 K12 S13 B1	<p>P10 Identifies the main Health Safety and Environmental considerations for an engineering fitter e.g. COSHH, HASAWA.</p> <p>P11 Gives an example of when they have disposed of waste in accordance with waste streams e.g. sorts recyclable materials from non-recyclable materials re-uses materials where appropriate.</p>	<p>D3 Demonstrates an understanding of where to improve health, safety and environmental processes within their workplace including action taken e.g. improved the audit of checks for COSHH related equipment with an example of an improvement they have made.</p> <p>D4 Promotes a culture of safety by acting as a role model. Identify risks and non-compliances advising other how to make their practice safer.</p>

<p>Problem Solving and Communication</p> <p>K5 K8 K13 K16 S7 S8 S9 S11 B2 B3 B4 B5</p>	<p>P12 Demonstrates when they have operated as an effective team member and taken responsibility, e.g., when they have contributed to solving a problem by listening and sharing their ideas in an effective manner, how they ensured deadlines were met, how they identified roles, responsibilities and accountabilities in a task and the importance of fulfilling their part.</p> <p>P13 Provides an example of having dealt with a situation that required resolving to a satisfactory outcome by including at least 2 different styles of communication to resolve the situation e.g., face-to-face, telephone, email.</p> <p>P14 Demonstrates when they have used a range of techniques to identify and solve problems with quality outcomes, using data to inform their decisions, and reporting those outcomes or issues.</p> <p>P15 Demonstrates how they respect others.</p> <p>P16 Describes how component or assembly specifications are used when implementing solutions.</p>	<p>D5 Uses specific continuous improvement techniques and methods from the work area to propose improvements and can demonstrate the impact achieved.</p> <p>D6 Develops proposals to make improvements that have had a positive impact on the team or customer relationships.</p> <p>D7 Explains the fitter's role in the wider business and the reporting channels and has examples of how they have used these channels.</p> <p>D8 Demonstrate they have proactively shared information in a professional manner which includes being open and honest at all times.</p> <p>D9 Tailors their approach to different audiences and can provide examples of communication at a variety of levels or with different audiences for example team members, managers, or customers).</p> <p>D10 Explains how engineering data can contribute to continuous improvement.</p>
<p>Wider Role and Commercial Considerations</p> <p>K2 K17 K18 S14 S15 B5 B1</p>	<p>P17 Demonstrates the benefits of understanding their role in the wider engineering sector and how other roles contribute to their work output, e.g., how</p>	<p>D11 Explains the likely impact of emerging technology on their role.</p> <p>D12 Explains the implications of not operating within quality,</p>

	<p>they have given support colleagues within another area of the business and how this linked back into their own areas.</p> <p>P18 Describes the main impact in terms of how their direct commercial productivity and efficiency has an impact within the key process e.g., impact in the cycle and key times within the business.</p> <p>P19 Demonstrates an understanding of how to operate in line with quality, Health, Safety and Environmental policies and procedures and knowing when to escalate issues, for example has correctly identified risks and hazards.</p> <p>P20 Demonstrates how they have taken responsibility for personal and professional development, keeping knowledge and skills up to date with emerging technology to perform the role effectively.</p> <p>P21 Demonstrates an understanding of the principles of design and operation for example design for cost, reverse engineering.</p> <p>P22 Demonstrates how they work diligently and independently, managing their own workload to support commercial objectives, even during challenging times.</p>	<p>health, safety, and environmental policies and how this is balanced against the need for efficiency.</p>
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Fail – An apprentice will fail where they do not demonstrate all the pass descriptors.

Professional Discussion Knowledge, Skills, and Behaviours

Ref	Grading descriptor
Knowledge	
K2	Principles of design and operation, for example, design for cost, minimising waste, productivity (speed), health and safety, reverse engineering.
K5	Component or assembly specifications, for example, electrical loading, load charts, torque settings, tolerances. What they are and how to use them.
K8	Engineering data, for example, electrical readings, vibration, speed, and calibration. What they are and how to interpret and use.
K11	Health and safety, including Health and Safety at Work Act, Personal Protective Equipment (PPE), manual handling, Control of Substances Hazardous to Health (COSHH), Provision and Use of Work Equipment Regulations (PUWER), Noise at Work Regulations, Electricity at Work regulations, risk assessments; how they must be applied in the workplace
K12	Environmental considerations; safe disposal of waste, minimising waste (re-use and recycle), energy efficiency
K13	Who they need to communicate with and when, and communication techniques - verbal and written.
K16	Improvement techniques, for example, 5S techniques, problem solving techniques, value stream mapping, kaizen, contributing to effective team working, Total Productive Maintenance.
K17	Fitters' role in wider operation. Limits of autonomy; reporting channels. Other functions that fitters could interact with for example health and safety, quality assurance, business improvement and excellence, their purpose and interdependencies. Internal and external customers.
K18	Commercial considerations including contractual arrangements (for example penalty clauses, targets). How the role contributes to commercial operations.
Skills	
S7	Problem solving; analysing the issue and fixing the issue where appropriate.
S8	Applying improvement techniques; recommending or implementing solutions where appropriate.
S9	Communicating with colleagues or customers (internal or external).
S11	Reporting work outcomes or issues.
S13	Disposing of waste in accordance with waste streams; re-cycling and re-using where appropriate.
S14	Operating within limits of responsibility.
S15	Operating in line with quality, health and safety and environmental policy and procedures; identifying risks and hazards and identifying control measure where applicable.
Behaviours	
B1	Takes personal responsibility and is resilient. For example, health and safety-first attitude, disciplined and responsible approach to risk, works diligently regardless of how much they are being supervised, accepts responsibility for managing their own time and workload and stays motivated and committed when facing challenges.

B2	Works effectively in teams. For example, integrates with the team, supports other people, considers implications of their own actions on other people and the business whilst working effectively to get the task completed.
B3	Effective communicator and personable. For example, open and honest communicator; communicates clearly using appropriate methods, listens well to others and have a positive, respectful attitude, adjusts approach to take account of equality and diversity considerations.
B4	Focuses on quality and problem solving. For example, follows instructions and guidance, demonstrates attention to detail, follows a logical approach to problem solving and seeks opportunities to improve quality, speed, and efficiency.
B5	Committed to continuous personal development. For example, reflects on skills, knowledge and behaviours and seeks opportunities to develop, adapts to different situations, environments or technologies and has a positive attitude to feedback and advice.

Final Grade

End-point assessors must individually grade each assessment method according to the requirements set out in the assessment plan. Restrictions on grading apply where apprentices re-sit or re-take an assessment method – see re-sit and re-take section below.

The assessment methods outlined in this plan are equally weighted. SIAS must combine the grades of all three assessment methods to determine the overall EPA grade. To achieve an EPA pass, apprentices must achieve a pass or distinction in the project and professional discussion and a pass in the multiple-choice test. A fail in any assessment method will result in an EPA fail. To achieve an EPA distinction, apprentices must achieve a pass in the multiple-choice test and a distinction in the project and professional discussion. See grading combinations table below.

Project: Report and Questions	Multiple-Choice Test	Professional Discussion	Overall Grading
Fail	Fail	Fail	Fail
Pass	Fail	Fail	Fail
Fail	Pass	Fail	Fail
Fail	Fail	Pass	Fail
Fail	Pass	Pass	Fail
Pass	Pass	Fail	Fail
Pass	Fail	Pass	Fail
Pass	Pass	Pass	Pass
Distinction	Fail	Fail	Fail
Distinction	Pass	Fail	Fail
Distinction	Fail	Pass	Fail
Distinction	Pass	Pass	Pass
Distinction	Pass	Distinction	Distinction
Fail	Fail	Distinction	Fail
Pass	Fail	Distinction	Fail
Fail	Pass	Distinction	Fail
Pass	Pass	Distinction	Pass

Moderation

Assessment organisations will undertake moderation of end-point assessor decisions through observations and examination of documentation on a risk sampling basis. Results cannot be confirmed until moderation has been completed.

Re-sits and re-takes

Apprentices who fail one or more assessment method will be offered the opportunity to take a re-sit or a re-take. A re-sit does not require further learning, whereas a re-take does.

Apprentices should have a supportive action plan to prepare for the re-sit or a re-take. The apprentice's employer will need to agree that a re-sit or re-take is an appropriate course of action.

An apprentice who fails any of the assessment methods, and therefore the EPA, in the first instance, will be required to re-sit or re-take those failed assessment methods.

Any assessment method re-sit or re-take is typically taken within 4 months of the EPA outcome notification, otherwise the entire EPA must be taken again, unless in the opinion of SIAS exceptional circumstances apply outside the control of the apprentice or their employer.

Re-sits and re-takes are not offered to apprentices wishing to move from pass to distinction.

Where any assessment method has to be re-sat or re-taken, the apprentice will be awarded a maximum EPA grade of pass, unless SIAS determines there are exceptional circumstances requiring a re-sit or re-take.

If a re-take or re-sit relates to the project, report, and questioning task the apprentice must be presented with a different task, which must cover the same components or activities.

If the re-take or re-sit relates to the knowledge test the apprentice will be presented with a new randomised on-line knowledge test.

If the re-take or re-sit relates to the professional discussion the apprentice must be questioned on the same subject area.

Certification

The outcomes from the End-Point Assessment will be reviewed and a grade conferred by SIAS in accordance with SIAS QA procedures, which are available from SIAS. SIAS will notify the employer of the outcome of each of the assessments.

SIAS will apply for the apprentice's certificate, which will be sent by ESFA. The certificate confirms that the apprentice has passed the End-Point Assessment, has demonstrated full competency across the standard and is job-ready.

Assessment Specification

The assessment specification can be found in the published assessment plan for the standard. Details of which elements of the apprenticeship standard will be tested by each test are given in the Mapping knowledge, skills, and behaviours section of this guide.

Mapping of knowledge, skills, and behaviours

Key:

Project, report including evidence, and questioning	PQ
Multiple-choice test	MCT
Professional discussion supported by a portfolio of evidence	PD

Ref	KSB to be assessed	Assessment Method
Knowledge		
K1	Materials used in components or assemblies, for example, mild steel, aluminium, composites, copper etc. Their use and application considerations, for example machinability, hardness, conductivity, cost, availability, compatibility.	MCT
K2	Principles of design and operation, for example, design for cost, minimising waste, productivity (speed), health and safety, reverse engineering.	PD
K3	Manufacturing and assembly processes for example, filing, sawing, scraping, drilling, soldering, bolting, wire cutting, threading, etc.	PQ
K4	Safe use of tools and equipment (hand and power tools); right tool for the job, requirements for machinery checks, adjustments, operation and shut down.	MCT and PQ
K5	Component or assembly specifications, for example, electrical loading, load charts, torque settings, tolerances. What they are and how to use them.	PD
K6	Techniques for measuring, marking, cutting, and drilling materials to the required size and shape, accurately, safely, and economically during manufacturing processes.	MCT
K7	Engineering mathematical and scientific principles; methods, techniques, graphical expressions, symbols, formulae, and calculations.	MCT
K8	Engineering data, for example, electrical readings, vibration, speed, and calibration. What they are and how to interpret and use.	PD
K9	Component or assembly documentation. For example, bill of materials, standard operating procedures, inspection records, assembly instructions, electrical, pneumatic, hydraulic circuit diagrams. What they are and how to interpret and use.	PQ
K10	Quality standards for components or assembly for example, drawing, calibration of equipment, materials specification. How to ensure they have been met and assured. Application of ISO9001 (Quality Management Standard) in the workplace.	PQ
K11	Health and safety, including Health and Safety at Work Act, Personal Protective Equipment (PPE), manual handling, Control of Substances	MCT and PD

Ref	KSB to be assessed	Assessment Method
	Hazardous to Health (COSHH), Provision and Use of Work Equipment Regulations (PUWER), Noise at Work Regulations, Electricity at Work regulations, risk assessments; how they must be applied in the workplace.	
K12	Environmental considerations; safe disposal of waste, minimizing waste (reuse and re-cycle), energy efficiency.	PD
K13	Who they need to communicate with and when, and communication techniques - verbal and written.	PD
K14	Planning techniques – resources, tools, equipment, people; time management.	PQ
K15	Component or assembly quality checks for example, checking tolerances, threads, voltages. Types of faults that occur and problem-solving techniques, for example, cause and effect, 5 Whys, flow process analysis etc.	PQ
K16	Improvement techniques, for example, 5S techniques, problem solving techniques, value stream mapping, kaizen, contributing to effective team working, Total Productive Maintenance.	PD
K17	Fitters' role in wider operation. Limits of autonomy; reporting channels. Other functions that fitters could interact with for example health and safety, quality assurance, business improvement and excellence, their purpose and interdependencies. Internal and external customers.	PD
K18	Commercial considerations including contractual arrangements (for example penalty clauses, targets). How the role contributes to commercial operations.	PD
Skills		
S1	Reading, interpreting, and understanding the component or assembly specification, diagrams, drawings, and work instructions.	PQ
S2	Planning component or assembly task – materials, tools, and equipment.	PQ
S3	Preparing work area for component or assembly task; sourcing required resources, tools and equipment.	PQ
S4	Carry out relevant planning and preparation activities before commencing work activity and know how to source required resources and interpret detailed drawings, specifications and job instructions.	PQ
S5	Checking tools during and after task completion; identifying and reporting defects.	PQ

Ref	KSB to be assessed	Assessment Method
S6	Measuring and testing, checking and inspecting component or assembly for example, use of micrometers, verniers, multimeters, voltmeter.	PQ
S7	Problem solving; analysing the issue and fixing the issue where appropriate.	PD
S8	Applying improvement techniques; recommending or implementing solutions where appropriate.	PD
S9	Communicating with colleagues or customers (internal or external).	PD
S10	Completing component or assembly documentation for example job instructions, drawings, quality control documentation.	PQ
S11	Reporting work outcomes or issues.	PD
S12	Restoring the work area on completion of the activity; returning any resources and consumables to the appropriate location and housekeeping.	PQ
S13	Disposing of waste in accordance with waste streams; re-cycling and re-using where appropriate.	PD
S14	Operating within limits of responsibility.	PD
S15	Operating in line with quality, health and safety and environmental policy and procedures; identifying risks and hazards and identifying control measure where applicable.	PD
Behaviours		
B1	Takes personal responsibility and is resilient. For example, health and safety-first attitude, disciplined and responsible approach to risk, works diligently regardless of how much they are being supervised, accepts responsibility for managing their own time and workload and stays motivated and committed when facing challenges.	PD
B2	Works effectively in teams. For example, integrates with the team, supports other people, considers implications of their own actions on other people and the business whilst working effectively to get the task completed.	PD
B3	Effective communicator and personable. For example, open and honest communicator; communicates clearly using appropriate methods, listens well to others and have a positive, respectful attitude, adjusts approach to take account of equality and diversity considerations.	PD
B4	Focuses on quality and problem solving. For example, follows instructions and guidance, demonstrates attention to detail, follows a logical approach to problem solving and seeks opportunities to improve quality, speed, and efficiency.	PD

Ref	KSB to be assessed	Assessment Method
B5	Committed to continuous personal development. For example, reflects on skills, knowledge and behaviours and seeks opportunities to develop, adapts to different situations, environments or technologies and has a positive attitude to feedback and advice.	PD

Further Information

For information about SIAS policies, quality assurance, re-sits, appeals, complaints and general enquiries please see our website: www.siasuk.com

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