



**Institute for Apprenticeships
& Technical Education**

COMPOSITES TECHNICIAN

Key information

Reference: ST0094

Version: 1.1

Level: 3

Typical duration to gateway: 36 months

Typical EPA period: 3 months

Maximum funding: £20000

Route: Engineering and manufacturing

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Lars code: 160

EQA provider: Ofqual

Review: This apprenticeship standard will be reviewed after three years

End-point assessment plan

V1.1

Introduction and overview

This document explains the requirements for end-point assessment (EPA) for the composites technician apprenticeship. End-point assessment organisations (EPAOs) must follow this when designing and delivering the EPA.

Composites technician apprentices, their employers and training providers should read this document.

A full-time composites technician apprentice typically spends 36 months on-programme (this means in training before the gateway). The apprentice must spend at least 12 months on-programme and complete the required amount of off-the-job training in line with the apprenticeship funding rules.

The apprentice must complete their training and meet the gateway requirements before starting their EPA. The EPA will assess occupational competence.

An approved EPAO must conduct the EPA for this apprenticeship. Employers must select an approved EPAO from the register of end-point assessment organisations (RoEPAO).

This EPA has 3 assessment methods.

The grades available for each assessment method are below.

Assessment method 1 - observation with questions:

- fail

- pass
- distinction

Assessment method 2 - interview underpinned by a portfolio of evidence:

- fail
- pass
- distinction

Assessment method 3 - multiple-choice test:

- fail
- pass

The result from each assessment method is combined to decide the overall apprenticeship grade. The following grades are available for the apprenticeship:

- fail
- pass
- merit
- distinction

EPA summary table

<p>On-programme - typically 36 months</p>	<p>The apprentice must:</p> <ul style="list-style-type: none"> • complete training to develop the knowledge, skills and behaviours (KSBs) outlined in this apprenticeship's occupational standard • complete training towards English and mathematics qualifications in line with the apprenticeship funding rules • compile a portfolio of evidence
<p>End-point assessment gateway</p>	<p>The apprentice's employer must be content that the apprentice has attained sufficient KSBs to complete the apprenticeship.</p> <p>The apprentice must:</p> <ul style="list-style-type: none"> • confirm they are ready to take the EPA • have achieved English and mathematics qualifications in line with the apprenticeship funding rules <p>For the interview underpinned by a portfolio of evidence, the apprentice must submit a portfolio of evidence.</p> <p>The apprentice must submit the gateway evidence to their EPAO, including any organisation specific policies and procedures requested by the EPAO.</p>
<p>End-point assessment - typically 3 months</p>	<p>The grades available for each assessment method are below</p> <p>Observation with questions:</p> <ul style="list-style-type: none"> • fail • pass • distinction <p>Interview underpinned by a portfolio of evidence:</p> <ul style="list-style-type: none"> • fail • pass • distinction <p>Multiple-choice test:</p>

	<ul style="list-style-type: none"> • fail • pass <p>Overall EPA and apprenticeship can be graded:</p> <ul style="list-style-type: none"> • fail • pass • merit • distinction
Professional recognition	<p>This apprenticeship aligns with:</p> <ul style="list-style-type: none"> • The Institute of Materials, Minerals and Mining for Engineering Technician (EngTech)
Re-sits and re-takes	<ul style="list-style-type: none"> • Re-take and re-sit grade cap: pass • Re-sit timeframe: typically 2 months • Re-take timeframe: typically 4 months

Duration of end-point assessment period

The EPA is taken in the EPA period. The EPA period starts when the EPAO confirms the gateway requirements have been met and is typically 3 months.

The EPAO should confirm the gateway requirements have been met and start the EPA as quickly as possible.

EPA gateway

The apprentice's employer must be content that the apprentice has attained sufficient KSBs to complete the apprenticeship. The employer may take advice from the apprentice's training provider, but the employer must make the decision. The apprentice will then enter the gateway.

The apprentice must meet the gateway requirements before starting their EPA.

They must:

- confirm they are ready to take the EPA

- have achieved English and mathematics qualifications in line with the apprenticeship funding rules
- Submit a portfolio of evidence for the interview underpinned by a portfolio of evidence

Portfolio of evidence requirements:

The apprentice must compile a portfolio of evidence during the on-programme period of the apprenticeship. It should only contain evidence related to the KSBs that will be assessed by this assessment method. It will typically contain 10 discrete pieces of evidence. Evidence must be mapped against the KSBs. Evidence may be used to demonstrate more than one KSB; a qualitative as opposed to quantitative approach is suggested.

Evidence sources may include:

- workplace documentation and records
- workplace policies and procedures
- witness statements
- annotated photographs
- video clips (maximum total duration 10 minutes); the apprentice must be in view and identifiable

This is not a definitive list; other evidence sources can be included.

The portfolio of evidence should not include reflective accounts or any methods of self-assessment. Any employer contributions should focus on direct observation of performance (for example, witness statements) rather than opinions. The evidence provided should be valid and attributable to the apprentice; the portfolio of evidence should contain a statement from the employer and apprentice confirming this.

The EPAO should not assess the portfolio of evidence directly as it underpins the interview. The independent assessor should review the portfolio of evidence to prepare questions for the interview. They are not required to provide feedback after this review.

The apprentice must submit the gateway evidence to their EPAO, including any organisation specific policies and procedures requested by the EPAO.

Order of assessment methods

The assessment methods can be delivered in any order.

The result of one assessment method does not need to be known before starting the next.

Observation with questions

Overview

In the observation with questions, an independent assessor observes the apprentice in their workplace and asks questions. The apprentice completes their day-to-day duties under normal working conditions. It gives the apprentice the opportunity to demonstrate the KSBs mapped to this assessment method.

Rationale

This assessment method is being used because:

- this is a practical role, best demonstrated through completing tasks in a real work setting
- observation makes use of employer resources and equipment, which will be familiar to the apprentice and thus allow them to perform at their best
- tasks completed during the observation should contribute to workplace productivity and are valid
- it is a holistic assessment method

Delivery

The observation with questions must be structured to give the apprentice the opportunity to demonstrate the KSBs mapped to this assessment method to the highest available grade.

An independent assessor must conduct and assess the observation with questions.

The independent assessor must only observe one apprentice at a time to ensure quality and rigour. They must be as unobtrusive as possible.

The EPAO must give the apprentice 2 weeks' notice of the observation with questions.

The observation must take 4 hours.

The independent assessor can increase the time of the observation with questions by up to 10%. This time is to allow the apprentice to complete a task or respond to a question if necessary.

The observation may be split into discrete sections held on the same working day.

The EPAO must manage invigilation of the apprentice during the assessment, to maintain security of the EPA, in line with their malpractice policy. This includes breaks and moving between locations.

The independent assessor must explain to the apprentice the format and timescales of the observation with questions before it starts. This does not count towards the assessment time.

The independent assessor should observe the following during the observation:

- complete composite pre-processing activities: risk assessment, organise and prepare materials, mould tool, hand tools and equipment
- conduct composite processing activities: use mould tool, laminate, complete preparation for and start curing process, and remove item from mould
- conduct final quality assurance procedure
- complete process manufacturing documentation - digital or paper based

Activities may relate to the same or different products.

These activities provide the apprentice with the opportunity to demonstrate the KSBs mapped to this assessment method.

The independent assessor must ask questions. Questioning can occur both during and after the observation.

The purpose of the independent assessor's questions is to assess the level of competence against the grading descriptors.

The time for questioning is included in the overall assessment time. The independent assessor must ask at least 5 questions. To remain as unobtrusive as possible, the independent assessor should ask questions during natural stops between tasks and after completion of work rather than disrupting the apprentice's flow. The independent assessor must use the questions from the EPAO's question bank or create their own questions in line with the EPAO's training. Follow-up questions are allowed where clarification is required.

The independent assessor must ask questions about KSBs that were not observed to gather assessment evidence. These questions are in addition to the above set number of questions for the observation with questions and should be kept to a minimum.

The independent assessor must make the grading decision. The independent assessor must assess the observation and responses to questions holistically when deciding the grade.

The independent assessor must keep accurate records of the assessment. They must record:

- the KSBs observed
- the apprentice's answers to questions
- the KSBs demonstrated in answers to questions
- the grade achieved

Assessment location

The observation with questions must take place in the apprentice's normal place of work for example, their employer's premises or a customer's premises. Equipment and resources needed for the observation must be provided by the employer and be in good and safe working condition.

Questioning that occurs after the observation should take place in a quiet room, free from distractions and influence.

In exceptional circumstances, the venue could be a simulated environment selected by the EPAO (for example, the EPAO's or employer's premises).

EPAOs must ensure suitable and familiar tools, equipment, machinery, resources, and materials are available within the simulated environment that replicate workplace and industry standards. The EPAO can liaise with the employer to provide these.

Simulated environments may only be used where apprentices are prevented from being observed in the workplace and remote observation is not a suitable alternative. For this occupation, a barrier could be that the presence of a third party for example the independent assessor, in a specific apprentice's workplace area is prohibited for verifiable security reasons.

The EPAO must retain evidence for the need to use a simulated environment for a particular employer or timeframe. This evidence will include a request and rationale from the employer contracting them for the EPA in scope.

The simulated environment must:

- be comparable with the original intended workplace observation, target the mapped KSBs and satisfy all defined parameters
- have a scenario and specification of defined tasks for the apprentice to complete (or an equivalent structure or format)
- replicate normal working conditions and the naturally occurring activities the apprentice would have undertaken in the workplace observation, as far as practicable (including time pressures, considerations, resources, information, interactions, communication media, lighting, noise and hazards they would reasonably encounter in employer or customer premises)
- ensure comparable assessment demand to the workplace observation within the original parameters of this assessment plan for example, adhere to specified durations, assessor to apprentice ratios, and questions
- afford the apprentice the opportunity to meet all existing grading descriptors at all levels (including fail)

Question and resource development

The EPAO must develop a purpose-built assessment specification and question bank. It is recommended this is done in consultation with employers of this occupation. The EPAO should maintain the security and confidentiality of EPA materials when consulting with employers. The assessment specification and question bank must be reviewed at least once a year to ensure they remain fit-for-purpose.

The assessment specification must be relevant to the occupation and demonstrate how to assess the KSBs mapped to this assessment method. The EPAO must ensure that questions are refined and developed to a high standard. The questions must be unpredictable. A question bank of sufficient size will support this.

The EPAO must produce the following materials to support the observation with questions:

- independent assessor assessment materials which include:
 - training materials
 - administration materials
 - moderation and standardisation materials
 - guidance materials
 - grading guidance
 - question bank
- EPA guidance for the apprentice and the employer

The EPAO must ensure that the EPA materials are subject to quality assurance procedures including standardisation and moderation.

Interview underpinned by a portfolio of evidence

Overview

In the interview, an independent assessor asks the apprentice questions. It gives the apprentice the opportunity to demonstrate the KSBs mapped to this assessment method.

The apprentice can refer to and illustrate their answers with evidence from their portfolio of evidence.

Rationale

This assessment method is being used because:

- it allows for assessment of KSBs that do not occur on a predictable or regular basis
- it allows for testing of responses where there are a range of potential answers that cannot be tested through the multiple-choice test
- it can be conducted remotely, potentially reducing cost

Delivery

The interview must be structured to give the apprentice the opportunity to demonstrate the KSBs mapped to this assessment method to the highest available grade.

An independent assessor must conduct and assess the interview.

The purpose of the independent assessor's questions is to assess the following themes:

- role
- sustainability
- design and manufacture - tools and processes
- composite process risks and repair
- problem solving and continuous improvement
- written communication
- information technology
- team working
- continued professional development

The EPAO must give an apprentice 2 weeks' notice of the interview.

The independent assessor must have at least 2 weeks to review the supporting documentation.

The apprentice must have access to their portfolio of evidence during the interview.

The apprentice can refer to and illustrate their answers with evidence from their portfolio of evidence however, the portfolio of evidence is not directly assessed.

The interview must last for 90 minutes. The independent assessor can increase the time of the interview by up to 10%. This time is to allow the apprentice to respond to a question if necessary.

The independent assessor must ask at least 9 questions. The independent assessor must use the questions from the EPAO's question bank or create their own questions in line with the EPAO's

training. Follow-up questions are allowed where clarification is required.

The independent assessor must make the grading decision.

The independent assessor must keep accurate records of the assessment. They must record:

- the apprentice's answers to questions
- the KSBs demonstrated in answers to questions
- the grade achieved

Assessment location

The interview must take place in a suitable venue selected by the EPAO for example, the EPAO's or employer's premises.

The interview can be conducted by video conferencing. The EPAO must have processes in place to verify the identity of the apprentice and ensure the apprentice is not being aided.

The interview should take place in a quiet room, free from distractions and influence.

Question and resource development

The EPAO must develop a purpose-built assessment specification and question bank. It is recommended this is done in consultation with employers of this occupation. The EPAO should maintain the security and confidentiality of EPA materials when consulting with employers. The assessment specification and question bank must be reviewed at least once a year to ensure they remain fit-for-purpose.

The assessment specification must be relevant to the occupation and demonstrate how to assess the KSBs mapped to this assessment method. The EPAO must ensure that questions are refined and developed to a high standard. The questions must be unpredictable. A question bank of sufficient size will support this.

The EPAO must ensure that apprentice has a different set of questions in the case of re-sits or re-takes.

The EPAO must produce the following materials to support the interview underpinned by a portfolio of evidence:

- independent assessor assessment materials which include:
 - training materials
 - administration materials
 - moderation and standardisation materials
 - guidance materials
 - grading guidance
 - question bank
- EPA guidance for the apprentice and the employer

The EPAO must ensure that the EPA materials are subject to quality assurance procedures including standardisation and moderation.

Multiple-choice test

Overview

In the multiple-choice test, the apprentice answers questions in a controlled and invigilated environment. It gives the apprentice the opportunity to demonstrate the knowledge mapped to this assessment method.

Rationale

This assessment method is being used because:

- it allows for the efficient testing of knowledge where there is a right or wrong answer
- it allows for flexibility in terms of when, where, and how it is taken
- it allows larger volumes of apprentices to be assessed at one time

Delivery

The multiple-choice test must be structured to give the apprentice the opportunity to demonstrate the knowledge mapped to this assessment method to the highest available grade.

The test can be computer or paper based.

The test will consist of 40 multiple-choice questions.

Multiple-choice questions must have four options, including one correct answer.

The apprentice must be given at least 2 weeks' notice of the date and time of the test.

Test administration

The apprentice must have 60 minutes to complete the test.

The test is closed book which means that the apprentice cannot refer to reference books or materials whilst taking the test.

The test must be taken in the presence of an invigilator who is the responsibility of the EPAO.

The EPAO must have an invigilation policy setting out how the test must be conducted. It must state the ratio of apprentices to invigilators for the setting and allow the test to take place in a secure way.

The EPAO is responsible for the security of the test including the arrangements for on-line testing. The EPAO must ensure that their security arrangements maintain the validity and reliability of the test.

Marking

The test must be marked by an independent assessor or marker employed by the EPAO. They must follow a marking scheme produced by the EPAO. Marking by computer is allowed where

question types support this.

A correct answer gets 1 mark.

Any incorrect or missing answers get zero marks.

The EPAO is responsible for overseeing the marking, standardisation and moderation of the test.

Assessment location

The apprentice must take the test in a suitably controlled and invigilated environment that is a quiet room, free from distractions and influence. The EPAO must check the venue is suitable.

The test could take place remotely if the appropriate technology and systems are in place to prevent malpractice. The EPAO must verify the apprentice's identity and ensure invigilation of the apprentice for example with, and not limited to, 360-degree cameras and screen sharing facilities.

Question and resource development

The EPAO must develop a purpose-built assessment specification and question bank. It is recommended this is done in consultation with employers of this occupation. The EPAO should maintain the security and confidentiality of EPA materials when consulting with employers. The assessment specification and question bank must be reviewed at least once a year to ensure they remain fit-for-purpose.

The assessment specification must be relevant to the occupation and demonstrate how to assess the KSBs mapped to this assessment method. The EPAO must ensure that questions are refined and developed to a high standard. The questions must be unpredictable. A question bank of sufficient size will support this.

The EPAO must ensure that apprentice has a different set of questions in the case of re-sits or re-takes.

The EPAO must produce the following materials to support the test:

- independent assessor assessment materials which include:
 - training materials
 - administration materials
 - moderation and standardisation materials
 - guidance materials
 - grading guidance
 - test specification
 - sample test and mark schemes
 - live tests and mark schemes
 - question bank
- EPA guidance for the apprentice and the employer

The EPAO must ensure that the EPA materials are subject to quality assurance procedures including standardisation and moderation.

Grading

Observation with questions

Fail - does not meet pass criteria

THEME KSBS	PASS APPRENTICES MUST DEMONSTRATE ALL THE PASS DESCRIPTORS	DISTINCTION APPRENTICES MUST DEMONSTRATE ALL THE PASS DESCRIPTORS AND ALL OF THE DISTINCTION DESCRIPTORS
Planning K37 S2	Plans work and identifies and organises resources required to complete tasks using planning, prioritising, and time management techniques. (K37, S2)	None
Work environment: health and safety, environment K4 S3 S4 S5 S19 B1	Identifies and documents hazards and risks in the workplace. Applies health and safety procedures in compliance with regulations and standards mitigating against risks including correct selection, inspection, operation, wearing, and disposal of personal protective equipment. Prioritises health and safety over other factors. (K4, S3, S4, B1) Applies environmental and sustainability procedures in compliance with regulations and standards including segregating resources for reuse, recycling, and disposal. (S5, S19)	Justifies their choice to comply with and prioritise health and safety legislation in their composites work. (K4, S4, B1)
Tools and equipment K16 S8 S9 S10	Selects and checks hand tools, equipment, and machinery for the task including checking calibration records if relevant. (S8) Uses or operates hand tools, equipment, and machinery in line with their employer's and manufacturers' instructions. (K16, S9) Stores hand tools and equipment after use in line with employer's guidelines. (S10)	None
Materials S11	Selects, checks, and prepares materials in line with manufacturing specification. (S11)	None

<p>Composite processing K22 K23 K26 S1 S7 S13 S14 S15</p>	<p>Performs the composite manufacturing processes of moulding, laminating, and curing and extracts product from the mould in line with drawings, instructions, and information for the task.</p> <p>Identifies the principles behind the curing process used.</p> <p>(K22, K23, K26, S1, S7, S13, S14, S15)</p>	<p>Produces a consistent high-quality output, mitigating against potential issues for example, attention to detail, right first time, minimises scrap rate, minimises defects.</p> <p>Explains how they can change the curing process to influence the quality of the final laminate.</p> <p>(K22, K23, K26, S1, S7, S13, S14, S15)</p>
<p>Quality assurance K28 S12 S16 B4</p>	<p>Applies quality control processes during manufacture and conducts final product quality assurance procedure in line with task requirements, taking responsibility for outcomes. (K28, S12, S16, B4)</p>	<p>Justifies the use of quality control and assurance methods for composite manufacturing. (K28, S12, S16, B4)</p>
<p>Communication K34 S25</p>	<p>Uses verbal communication techniques suitable for the context, adapting style and use of terminology to suit the audience. (K34, S25)</p>	<p>None</p>
<p>Documentation K29 S20</p>	<p>Records or enters data to complete work records required for tasks correctly and in full - paper based or electronic. (K29, S20)</p>	<p>None</p>

Interview underpinned by a portfolio of evidence

Fail - does not meet pass criteria

THEME KSBS	PASS APPRENTICES MUST DEMONSTRATE ALL THE PASS DESCRIPTORS	DISTINCTION APPRENTICES MUST DEMONSTRATE ALL THE PASS DESCRIPTORS AND ALL OF THE DISTINCTION DESCRIPTORS
Composite technician's role K2 K27 S18 B3	<p>Explains how they conduct their role in line with limits of responsibility and escalate issues outside their remit in line with company procedures. (K2, S18)</p> <p>Explains how they adhere to organisational quality, cost, and delivery (QCD) standards and company professional integrity standards. (S18, B3)</p>	None
Sustainability K6 S6 B2	Describes how they consider and apply the principles of environmental sustainability in their work in line with organisational procedures, regulations and standards on energy efficiency, material reuse, recycling, and management of emissions and waste. (K6, S6, B2)	Supports the development of environmental and sustainability practice in the workplace for example, through promoting good practice to others, identifying improvement to practice. (K6, S6, B2)
Design and manufacture - tools and processes K19 K20 K21	Explains composite mould tool manufacture methods, techniques and considerations, showing awareness of the application of digital systems to support manufacture: CAD (computer-aided design), CAM (computer-aided manufacturing), CMM (coordinate measuring machine), and additive manufacture and composite tooling and product design process with reference to their company's practices. (K19, K20, K21)	None
Composite process risk and repairs K24 K25	Explains process risk in composite manufacture and mitigation, defect types and causes, and repair techniques: step, scarf, gel, resin injection, and riveting with reference	None

	to their company's practice. (K24, K25)	
Problem solving and continuous improvement K31 K32 S17 S21 S22 S23	<p>Explains how they have identified an issue with a composite and applied either root cause analysis or 5-Whys method to investigate, identifying the cause and finding a solution. (K31, S17, S22)</p> <p>Explains how they have applied either the lean, 6-sigma, KAIZEN, or 5S continuous improvement technique to provide a solution to a composite related issue or process in their own work. (K32, S23)</p> <p>Explains how they have interpreted data and used it to validate suggestions related to composite product or process improvement. (S21)</p>	Evaluates how the improvement suggestion has the potential to improve the work of the wider team, workplace, or system. (K32, S23)
Written communication K35 S26	Describes how they have communicated in written form in the workplace using techniques suitable for context. (K35, S26)	None
Information technology K33 S27	Describes how they have applied information technology in work tasks in compliance with GDPR and organisational cyber security regulations and policies. (K33, S27)	None
Team working K36 S24 B5 B6	Describes how they have applied team working principles in line with the organisational policy on equality, diversity, and inclusion within their own team. Describes how they have responded and adapted to work demands or situations to support their own team's work goals. (K36, S24, B5, B6)	Explains how their team focus and commitment to inclusivity extends to wider teams or stakeholders. (K36, S24, B5, B6)
Continued professional	Describes the planned and unplanned continued professional development (CPD) activities they have carried out and recorded to	None

development S28 B7	meet personal and organisation development needs, showing a commitment to future CPD. Evaluates what the impact of their CPD has been and how it has benefited the business. (S28, B7)	
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Multiple-choice test

GRADE	MINIMUM MARKS REQUIRED	MAXIMUM MARKS REQUIRED
Fail	0	27
Pass	28	40

Overall EPA grading

Performance in the EPA determines the overall grade of:

- fail
- pass
- merit
- distinction

An independent assessor must individually grade the observation with questions and interview underpinned by a portfolio of evidence in line with this EPA plan.

The EPAO must combine the individual assessment method grades to determine the overall EPA grade.

If the apprentice fails one assessment method or more, they will be awarded an overall fail.

To achieve an overall pass, the apprentice must achieve at least a pass in all the assessment methods. To achieve an overall EPA merit, the apprentice must achieve a distinction in one assessment method (observation with questions or interview underpinned by a portfolio of evidence), and a pass in the multiple-choice test. To achieve an overall EPA distinction, the apprentice must achieve a distinction in the observation with questions and interview underpinned by a portfolio of evidence, and a pass in the multiple-choice test.

Grades from individual assessment methods must be combined in the following way to determine the grade of the EPA overall.

OBSERVATION WITH QUESTIONS	INTERVIEW UNDERPINNED BY A PORTFOLIO OF EVIDENCE	MULTIPLE-CHOICE TEST	OVERALL GRADING
Any grade	Any grade	Fail	Fail
Any grade	Fail	Any grade	Fail
Fail	Any grade	Any grade	Fail
Pass	Pass	Pass	Pass
Distinction	Pass	Pass	Merit
Pass	Distinction	Pass	Merit
Distinction	Distinction	Pass	Distinction

Re-sits and re-takes

An apprentice who fails one or more assessment method(s) can take a re-sit or a re-take at the employer's discretion. The apprentice's employer needs to agree that a re-sit or re-take is appropriate. A re-sit does not need further learning, whereas a re-take does.

The apprentice should have a supportive action plan to prepare for a re-sit or a re-take.

The apprentice's employer and EPAO agree the timescale for a re-sit or re-take. A re-sit is typically taken within 2 months of the EPA outcome notification. The timescale for a re-take is dependent on how much re-training is required and is typically taken within 4 months of the EPA outcome notification.

Failed EPA methods must be re-sat or re-taken within a 6-month period from the EPA outcome notification, otherwise the entire EPA will need to be re-sat or re-taken in full.

Re-sits and re-takes are not offered to an apprentice wishing to move from pass to a higher grade.

The apprentice will get a maximum EPA grade of pass for a re-sit or re-take, unless the EPAO determines there are exceptional circumstances.

Roles and responsibilities

ROLES	RESPONSIBILITIES
Apprentice	<p>As a minimum, the apprentice should:</p> <ul style="list-style-type: none"> • complete on-programme training to meet the KSBs as outlined in the occupational standard for a minimum of 12 months • complete the required amount of off-the-job training specified by the apprenticeship funding rules and as arranged by the employer and training provider • understand the purpose and importance of EPA • prepare for and undertake the EPA including meeting all gateway requirements • ensure that all supporting evidence required at the gateway is submitted in line with this EPA plan
Employer	<p>As a minimum, the apprentice's employer must:</p> <ul style="list-style-type: none"> • select the EPAO and training provider • work with the training provider (where applicable) to support the apprentice in the workplace and to provide the opportunities for the apprentice to develop the KSBs • arrange and support off-the-job training to be undertaken by the apprentice • decide when the apprentice is working at or above the occupational standard and is ready for EPA • ensure the apprentice is prepared for the EPA • ensure that all supporting evidence required at the gateway is submitted in line with this EPA plan • confirm arrangements with the EPAO for the EPA (who, when, where) in a timely manner • provide access to any employer-specific documentation as required for example, company policies • ensure that the EPA is scheduled with the EPAO for a date and time which allows appropriate opportunity for the apprentice to meet the KSBs • ensure the apprentice is given sufficient time away from regular duties to prepare for, and complete the EPA • ensure that any required supervision during the EPA period, as stated within this EPA plan, is in place • ensure the apprentice has access to the resources used to fulfil their role and carry out the EPA for workplace based assessments

	<ul style="list-style-type: none"> • remain independent from the delivery of the EPA • pass the certificate to the apprentice upon receipt from the EPAO
EPAO	<p>As a minimum, the EPAO must:</p> <ul style="list-style-type: none"> • conform to the requirements of this EPA plan and deliver its requirements in a timely manner • conform to the requirements of the RoEPAO • conform to the requirements of the external quality assurance provider (EQAP) • understand the apprenticeship including the occupational standard, EPA plan and funding • make all necessary contractual arrangements including agreeing the price of the EPA • develop and produce assessment materials including specifications and marking materials (for example mark schemes, practice materials, training material) • maintain and apply a policy for the declaration and management of conflict of interests and independence. This must ensure, as a minimum, there is no personal benefit or detriment for those delivering the EPA or from the result of an assessment. It must cover: <ul style="list-style-type: none"> • apprentices • employers • independent assessors • any other roles involved in delivery or grading of the EPA • have quality assurance systems and procedures that ensure fair, reliable and consistent assessment and maintain records of internal quality assurance (IQA) activity for external quality assurance (EQA) purposes • appoint independent, competent, and suitably qualified assessors in line with the requirements of this EPA plan • appoint administrators, invigilators and any other roles where required to facilitate the EPA • deliver induction, initial and on-going training for all their independent assessors and any other roles involved in the delivery or grading of the EPA as specified within this EPA plan. This should include how to record the rationale and evidence for grading decisions where required • conduct standardisation with all their independent assessors before allowing them to deliver an EPA, when the EPA is

	<p>updated, and at least once a year</p> <ul style="list-style-type: none"> • conduct moderation of all their independent assessors' decisions once EPAs have started • monitor the performance of all their independent assessors and provide re-training where necessary • develop and provide assessment recording documentation to ensure a clear and auditable process is in place for providing assessment decisions and feedback to all relevant stakeholders • use language in the development and delivery of the EPA that is appropriate to the level of the apprenticeship • arrange for the EPA to take place in a timely manner, in consultation with the employer • provide information, advice, and guidance documentation to enable apprentices, employers and training providers to prepare for the EPA • confirm the gateway requirements have been met before they start the EPA for an apprentice • host and facilitate the EPA or make suitable alternative arrangements • maintain the security of the EPA including, but not limited to, verifying the identity of the apprentice, invigilation and security of materials • where the EPA plan permits assessment away from the workplace, ensure that the apprentice has access to the required resources and liaise with the employer to agree this if necessary • confirm overall grade awarded • arrange the certification of the apprenticeship • maintain and apply a policy for conducting appeals
Independent assessor	<p>As a minimum, an independent assessor must:</p> <ul style="list-style-type: none"> • be independent, with no conflict of interest with the apprentice, their employer or training provider, specifically, they must not receive a personal benefit or detriment from the result of the assessment • have, maintain and be able to evidence up-to-date knowledge and expertise of the occupation • have the competence to assess the EPA and meet the requirements of the IQA section of this EPA plan

	<ul style="list-style-type: none"> • understand the apprenticeship's occupational standard and EPA plan • attend induction and standardisation events before they conduct an EPA for the first time, when the EPA is updated, and at least once a year • use language in the delivery of the EPA that is appropriate to the level of the apprenticeship • work with other personnel, including additional assessors where used, in the preparation and delivery of assessment methods • conduct the EPA to assess the apprentice against the KSBs and in line with the EPA plan • make final grading decisions in line with this EPA plan • record and report assessment outcome decisions • comply with the IQA requirements of the EPAO • comply with external quality assurance (EQA) requirements
Training provider	<p>As a minimum, the training provider must:</p> <ul style="list-style-type: none"> • conform to the requirements of the register of apprenticeship training providers (RoATP) • ensure procedures are in place to mitigate against any conflict of interest • work with the employer and support the apprentice during the off-the-job training to provide the opportunities to develop the KSBs as outlined in the occupational standard • deliver training to the apprentice as outlined in their apprenticeship agreement • monitor the apprentice's progress during any training provider led on-programme learning • ensure the apprentice is prepared for the EPA • advise the employer, upon request, on the apprentice's readiness for EPA • ensure that all supporting evidence required at the gateway is submitted in line with this EPA plan • remain independent from the delivery of the EPA
Marker	<p>As a minimum, the marker must:</p> <ul style="list-style-type: none"> • attend induction training as directed by the EPAO • have no direct connection or conflict of interest with the apprentice, their employer or training provider

	<ul style="list-style-type: none"> mark test answers in line with the EPAO's mark scheme and procedures
Invigilator	<p>As a minimum, the invigilator must:</p> <ul style="list-style-type: none"> attend induction training as directed by the EPAO have no direct connection or conflict of interest with the apprentice, their employer or training provider invigilate and supervise the apprentice during tests and in breaks during assessment methods to prevent malpractice in line with the EPAO's invigilation procedures

Reasonable adjustments

The EPAO must have reasonable adjustments arrangements for the EPA.

This should include:

- how an apprentice qualifies for reasonable adjustment
- what reasonable adjustments may be made

Adjustments must maintain the validity, reliability and integrity of the EPA as outlined in this EPA plan.

Internal quality assurance

Internal quality assurance refers to the strategies, policies and procedures that an EPAO must have in place to ensure valid, consistent and reliable EPA decisions.

EPAOs for this EPA must adhere to the requirements within the roles and responsibilities table.

They must also appoint independent assessors who:

- have recent relevant experience of the occupation or sector to at least occupational level 3 gained in the last 3 years or significant experience of the occupation or sector

Value for money

Affordability of the EPA will be aided by using at least some of the following:

- completing applicable assessment methods online (for example computer-based assessment)
- utilising digital remote platforms to conduct applicable assessment methods
- assessing multiple apprentices simultaneously where the assessment method permits this
- using the employer's premises
- conducting assessment methods on the same day

Professional recognition

This apprenticeship aligns with:

- The Institute of Materials, Minerals and Mining for Engineering Technician (EngTech)

KSB mapping table

KNOWLEDGE	ASSESSMENT METHODS
<p>K1 Composite industry awareness. Range of composite products. Manufacturing environments. Types of customers.</p>	Multiple-choice test
<p>K2 Composite technician's role. Limits of responsibility. Escalation procedures.</p>	Interview underpinned by a portfolio of evidence
<p>K3 Health and safety regulations and standards awareness. Control of Substances Hazardous to Health (COSHH). Display Screen Equipment. Electrical safety and compliance. Fire safety. Hand arm vibration (HAVS). Health and Safety at Work Act – responsibilities. Human factors, ergonomics. Legionella. Lifting Operations and Lifting Equipment Regulations (LOLER). Lone working. Manual handling. Noise regulation. Provision and Use of Work Equipment Regulations (PUWER). Slips trips and falls. The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR). Working at Height. Working in Confined Spaces.</p>	Multiple-choice test
<p>K4 Health and safety practice. Risk assessment and risk mitigation in composites process manufacturing environment. Personal protective equipment (PPE) requirements: selection, inspection, operation, wearing, and disposal.</p>	Observation with questions
<p>K5 Environmental and sustainability regulations and guidance. Environmental hazards that can arise from composite operations. Environmental management systems standard. Environmental Protection Act. Environmental signage and notices.</p>	Multiple-choice test
<p>K6 Principles of sustainability and circular economy. Energy efficiency and reuse of materials. Recycling procedures. Principles of control and management of emissions and waste.</p>	Interview underpinned by a portfolio of evidence
<p>K7 Definition of a composite. Interaction between resin and fibre. Types of core. Benefits of adding core. Advantages and disadvantages of composites.</p>	Multiple-choice test
<p>K8</p>	Multiple-choice test

The characteristics of finished composite products and their various applications.	
K9 The difference between thermoset and thermoplastics: mechanical and thermal benefits, processing requirements, and re-cycling potential.	Multiple-choice test
K10 Types of reinforcement materials: aramid, carbon, glass, natural fibres, and thermoplastic fibres; processing, cost, performance, benefits, and limitations.	Multiple-choice test
K11 Types of matrix materials: bismaleimide, cyanate ester, epoxy, phenolic, polyester, vinylester, and bio-derived: processing, cost, performance, benefits, and limitations.	Multiple-choice test
K12 The manufacture of materials: chopped strand mat, non-crimp fabrics, pre-impregnated, preforms, unidirectional, and woven reinforcements. Different weave styles: plain, satin and twill; impact on drape and mechanical properties.	Multiple-choice test
K13 Composite process materials and consumables: peel plies, release agents, release films, sealant tapes, and vacuum bag; application and benefits of use.	Multiple-choice test
K14 Hand lay-up techniques: open moulding, spray lay-up, and pre-impregnated. Resin infusion, resin transfer moulding, and closed moulding using vacuum techniques.	Multiple-choice test
K15 Awareness of automated lay-up: automated fibre placement, automated tape layup, braiding, and filament winding.	Multiple-choice test
K16 Plant, equipment, machinery, and hand tools used within composites manufacture: application and operation.	Observation with questions
K17 The curing cycle. Glass transition temperature (T _g). The science of pressure and vacuum.	Multiple-choice test

<p>K18 Principles of process control and instrument control methodology.</p>	Multiple-choice test
<p>K19 Awareness of application of digital systems to support manufacture: CAD (computer-aided design), CAM (computer-aided manufacturing), CMM (coordinate measuring machine), and additive manufacture.</p>	Interview underpinned by a portfolio of evidence
<p>K20 Composite tooling and product design process awareness.</p>	Interview underpinned by a portfolio of evidence
<p>K21 Composite mould tool manufacture methods, techniques, and considerations.</p>	Interview underpinned by a portfolio of evidence
<p>K22 Composite mould tool preparation and operation.</p>	Observation with questions
<p>K23 Composite manufacture processes and principles: moulding, laminating, and curing.</p>	Observation with questions
<p>K24 Process risk in composite manufacture and mitigation. Defect types and causes.</p>	Interview underpinned by a portfolio of evidence
<p>K25 Composite repair techniques: step, scarf, gel, resin injection, and riveting.</p>	Interview underpinned by a portfolio of evidence
<p>K26 Standard operating procedures, drawings, and work instructions: what are they, why they are important.</p>	Observation with questions
<p>K27 Quality, cost, and delivery (QCD) standards and their importance in the workplace.</p>	Interview underpinned by a portfolio of evidence
<p>K28 Quality assurance, testing and inspection methods.</p>	Observation with questions

K29 Documentation requirements.	Observation with questions
K30 Awareness of audits and their purpose.	Multiple-choice test
K31 Problem solving: root cause analysis, 5-Whys.	Interview underpinned by a portfolio of evidence
K32 Continuous improvement (CI) techniques: lean, 6-sigma, KAIZEN, and 5S.	Interview underpinned by a portfolio of evidence
K33 Information technology. Management information systems, word processing, spreadsheet, email, virtual learning platforms, document sharing platforms. General data protection regulation (GDPR). Cyber security.	Interview underpinned by a portfolio of evidence
K34 Verbal communication techniques. Composite industry terminology.	Observation with questions
K35 Written communication techniques.	Interview underpinned by a portfolio of evidence
K36 Principles of team working. Equality, diversity and inclusion.	Interview underpinned by a portfolio of evidence
K37 Planning, prioritising, and time management techniques.	Observation with questions

SKILL	ASSESSMENT METHODS
S1 Review drawings, instructions, or information to understand task.	Observation with questions
S2 Plan work. Identify and organise resources.	Observation with questions
S3 Identify hazards and risks in the workplace.	Observation with questions
S4 Apply health and safety procedures in compliance with regulations and standards.	Observation with questions
S5 Apply environmental and sustainability procedures in compliance with regulations and standards.	Observation with questions
S6 Apply sustainability principles for example, in choice of materials, minimising waste.	Interview underpinned by a portfolio of evidence
S7 Prepare and use mould tools.	Observation with questions
S8 Select and check hand tools, equipment and machinery including calibration record.	Observation with questions
S9 Use or operate hand tools, equipment, and machinery.	Observation with questions
S10 Store mould tools, hand tools, and equipment.	Observation with questions
S11 Select, check, and prepare materials for example, weigh resins, cut reinforcement.	Observation with questions
S12 Follow quality control processes during manufacture for example, check for contaminants, record batch numbers or expiry dates.	Observation with questions

<p>S13 Apply laminate to mould for example, cut, add darts, corner definition, orientation, position, and order.</p>	<p>Observation with questions</p>
<p>S14 Complete preparation for and start curing process for example, select and apply consumables for example vacuum bag, infuse with resin, add heat or pressure.</p>	<p>Observation with questions</p>
<p>S15 Extract product from mould (break out).</p>	<p>Observation with questions</p>
<p>S16 Conduct final product quality assurance procedure. For example, conduct grading parameters checks (size, appearance, weight), and take samples for laboratory testing.</p>	<p>Observation with questions</p>
<p>S17 Identify issues for example, de-laminations, inclusions, surface defects, surface imperfections, and maintenance requirements.</p>	<p>Interview underpinned by a portfolio of evidence</p>
<p>S18 Escalate issues outside limits of responsibility.</p>	<p>Interview underpinned by a portfolio of evidence</p>
<p>S19 Segregate resources for reuse, recycling, and disposal.</p>	<p>Observation with questions</p>
<p>S20 Record or enter data - paper based or electronic. For example, process and production records, traceability records, and quality assurance records.</p>	<p>Observation with questions</p>
<p>S21 Interpret data for example, defect data and geometrical measurements. Use data to validate suggestions.</p>	<p>Interview underpinned by a portfolio of evidence</p>
<p>S22 Investigate a problem to identify the underlying cause. Identify a solution to the problem.</p>	<p>Interview underpinned by a portfolio of evidence</p>
<p>S23 Apply continuous improvement techniques. Devise suggestions for improvement. For example, improving the energy consumption or waste profile of processes and procedures to</p>	<p>Interview underpinned by a portfolio of evidence</p>

improve the sustainability or carbon footprint of a product, process, or task.	
S24 Apply team working principles.	Interview underpinned by a portfolio of evidence
S25 Communicate with others verbally for example, colleagues and stakeholders.	Observation with questions
S26 Communicate in written form in the workplace for example, handover notes or emails, non-conformances, design change requests.	Interview underpinned by a portfolio of evidence
S27 Use information technology for work tasks. Comply with GDPR and cyber security regulations and policies.	Interview underpinned by a portfolio of evidence
S28 Plan how to meet personal development needs. Carry out and record planned and unplanned continued professional development (CPD) activities. Evaluate CPD against plans made.	Interview underpinned by a portfolio of evidence

BEHAVIOUR	ASSESSMENT METHODS
B1 Prioritise health and safety.	Observation with questions
B2 Consider the environment and sustainability.	Interview underpinned by a portfolio of evidence
B3 Demonstrate professional integrity.	Interview underpinned by a portfolio of evidence
B4 Take responsibility for the quality of work.	Observation with questions
B5 Team-focus with commitment to inclusivity.	Interview underpinned by a portfolio of evidence
B6 Respond and adapt to work demands or situations.	Interview underpinned by a portfolio of evidence
B7 Committed to continued professional development.	Interview underpinned by a portfolio of evidence

Mapping of KSBs to grade themes

Observation with questions

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Planning K37 S2	Planning, prioritising, and time management techniques. (K37)	Plan work. Identify and organise resources. (S2)	None
Work environment: health and safety, environment K4 S3 S4 S5 S19 B1	Health and safety practice. Risk assessment and risk mitigation in composites process manufacturing environment. Personal protective equipment (PPE) requirements: selection, inspection, operation, wearing, and disposal. (K4)	Identify hazards and risks in the workplace. (S3) Apply health and safety procedures in compliance with regulations and standards. (S4) Apply environmental and sustainability procedures in compliance with regulations and standards. (S5) Segregate resources for reuse, recycling, and disposal. (S19)	Prioritise health and safety. (B1)
Tools and equipment K16 S8 S9 S10	Plant, equipment, machinery, and hand tools used within composites manufacture: application and operation. (K16)	Select and check hand tools, equipment and machinery including calibration record. (S8) Use or operate hand tools, equipment, and machinery. (S9) Store mould tools, hand tools, and equipment. (S10)	None
Materials S11	None	Select, check, and prepare materials for example, weigh resins, cut reinforcement. (S11)	None

<p>Composite processing K22 K23 K26 S1 S7 S13 S14 S15</p>	<p>Composite mould tool preparation and operation. (K22)</p> <p>Composite manufacture processes and principles: moulding, laminating, and curing. (K23)</p> <p>Standard operating procedures, drawings, and work instructions: what are they, why they are important. (K26)</p>	<p>Review drawings, instructions, or information to understand task. (S1)</p> <p>Prepare and use mould tools. (S7)</p> <p>Apply laminate to mould for example, cut, add darts, corner definition, orientation, position, and order. (S13)</p> <p>Complete preparation for and start curing process for example, select and apply consumables for example vacuum bag, infuse with resin, add heat or pressure. (S14)</p> <p>Extract product from mould (break out). (S15)</p>	<p>None</p>
<p>Quality assurance K28 S12 S16 B4</p>	<p>Quality assurance, testing and inspection methods. (K28)</p>	<p>Follow quality control processes during manufacture for example, check for contaminants, record batch numbers or expiry dates. (S12)</p> <p>Conduct final product quality assurance procedure. For example, conduct grading parameters checks (size, appearance, weight), and take samples for</p>	<p>Take responsibility for the quality of work. (B4)</p>

		laboratory testing. (S16)	
Communication K34 S25	Verbal communication techniques. Composite industry terminology. (K34)	Communicate with others verbally for example, colleagues and stakeholders. (S25)	None
Documentation K29 S20	Documentation requirements. (K29)	Record or enter data - paper based or electronic. For example, process and production records, traceability records, and quality assurance records. (S20)	None

Interview underpinned by a portfolio of evidence

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Composite technician's role K2 K27 S18 B3	Composite technician's role. Limits of responsibility. Escalation procedures. (K2) Quality, cost, and delivery (QCD) standards and their importance in the workplace. (K27)	Escalate issues outside limits of responsibility. (S18)	Demonstrate professional integrity. (B3)
Sustainability K6 S6 B2	Principles of sustainability and circular economy. Energy efficiency and reuse of materials. Recycling procedures. Principles of control and management of emissions and waste. (K6)	Apply sustainability principles for example, in choice of materials, minimising waste. (S6)	Consider the environment and sustainability. (B2)
Design and manufacture - tools and processes K19 K20 K21	Awareness of application of digital systems to support manufacture: CAD (computer-aided design), CAM (computer-aided manufacturing), CMM (coordinate measuring machine), and additive manufacture. (K19) Composite tooling and product design process awareness. (K20) Composite mould tool manufacture methods,	None	None

	techniques, and considerations. (K21)		
Composite process risk and repairs K24 K25	<p>Process risk in composite manufacture and mitigation. Defect types and causes. (K24)</p> <p>Composite repair techniques: step, scarf, gel, resin injection, and riveting. (K25)</p>	None	None
Problem solving and continuous improvement K31 K32 S17 S21 S22 S23	<p>Problem solving: root cause analysis, 5-Whys. (K31)</p> <p>Continuous improvement (CI) techniques: lean, 6-sigma, KAIZEN, and 5S. (K32)</p>	<p>Identify issues for example, delaminations, inclusions, surface defects, surface imperfections, and maintenance requirements. (S17)</p> <p>Interpret data for example, defect data and geometrical measurements. Use data to validate suggestions. (S21)</p> <p>Investigate a problem to identify the underlying cause. Identify a solution to the problem. (S22)</p> <p>Apply continuous improvement techniques. Devise suggestions for improvement. For example, improving the energy consumption or waste profile of processes and</p>	None

		procedures to improve the sustainability or carbon footprint of a product, process, or task. (S23)	
Written communication K35 S26	Written communication techniques. (K35)	Communicate in written form in the workplace for example, handover notes or emails, non-conformances, design change requests. (S26)	None
Information technology K33 S27	Information technology. Management information systems, word processing, spreadsheet, email, virtual learning platforms, document sharing platforms. General data protection regulation (GDPR). Cyber security. (K33)	Use information technology for work tasks. Comply with GDPR and cyber security regulations and policies. (S27)	None
Team working K36 S24 B5 B6	Principles of team working. Equality, diversity and inclusion. (K36)	Apply team working principles. (S24)	Team-focus with commitment to inclusivity. (B5) Respond and adapt to work demands or situations. (B6)
Continued professional development S28 B7	None	Plan how to meet personal development needs. Carry out and record planned and unplanned continued professional development (CPD) activities. Evaluate	Committed to continued professional development. (B7)

		CPD against plans made. (S28)	
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Version log

Version	Change detail	Earliest start date	Latest start date	Latest end date
1.1	End-point assessment plan and funding revised	14/03/2023	Not set	Not set
1.0	Approved for delivery	16/02/2017	13/03/2023	Not set

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