PIABC LEVEL 3 END POINT ASSESSMENT FOR COMPOSITES TECHNICIAN

Qualification Number: 610/0327/X

Apprenticeship Standard Reference: ST0094
Apprenticeship Assessment Plan Reference: ST0094/AP01

Specification

Updated: 21 September 2022

CONTENTS

1. PURPOSE

This specification has been written to provide information about the Level 3 Composite Technician apprenticeship end point assessment for all individuals involved: apprentices, training providers, and employers. Information is correct at the time of publication. However, the specification may be updated from time to time to reflect any legislative, policy and/or operational changes.

2. INTRODUCTION

PIABC Limited is the trading subsidiary of The Institute of Materials, Minerals and Mining (IOM3). IOM3 is a major UK engineering institution whose activities encompasses the whole materials cycle, from exploration and extraction, through characterisation, processing, forming, finishing and application, to product recycling and land reuse. It exists to promote and develop all aspects of materials science and engineering, geology, mining and associated technologies, mineral and petroleum engineering, and extraction metallurgy, as a leading authority in the worldwide materials and mining community.

PIABC Limited is an End Point Assessment Organisation (EPAO) approved by the Education & Skills Funding Agency (ESFA) and listed on *Register of End-Point Assessment Organisations* (RoEPAO) to administer a range of End Point Assessment (EPA) to apprentices as specified in the relevant assessment plans.

Apprenticeships are work-based training programmes which combine on the job training, formal learning, and paid employment. A Level 3 apprenticeship can be considered to be at the same level as A-levels and, although the primary intention when these programmes were set up was to provide 16-19 learners with an alternative to employment without formal training or a traditional academic sixth form route, they can be undertaken by people of any age.

The development of the Level 3 Composites Apprenticeship was undertaken by a Trailblazer Group who are a group of representatives from the composites industry. This group identified the specialist KSBs that they felt were needed to perform at this level in their sector and these were put together into a standard, which essentially defines the syllabus for the apprenticeship programme. The standard ensures an apprentice will receive more than just training for a single job or employer; they ensure that apprentices can adapt to a variety of roles, with different employers, and develop the ability to progress their careers.

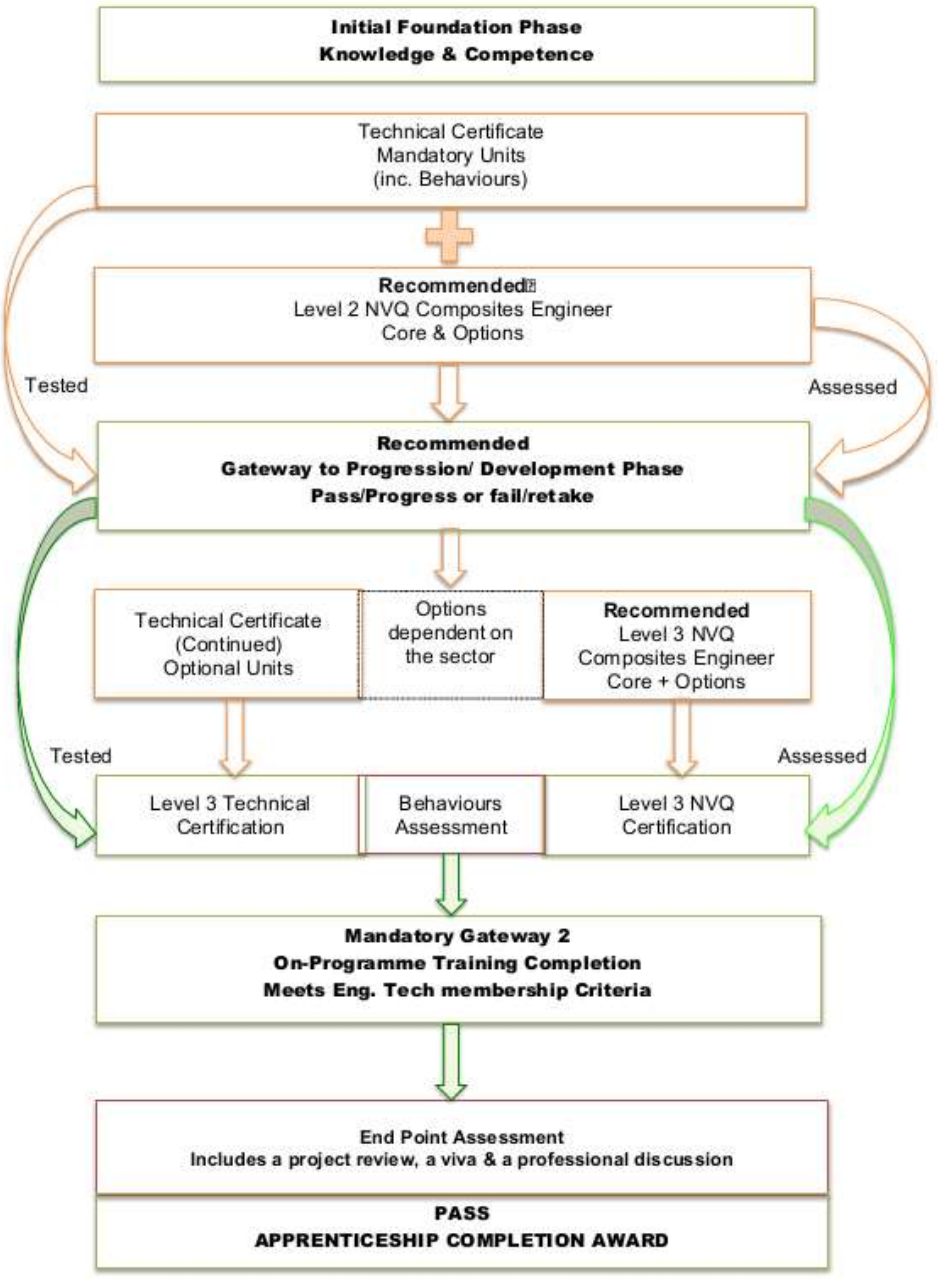
In addition, all employer-led apprenticeship standards must demonstrate acquisition of transferable skills – such as self-management, communication and interpersonal skills, problem solving, innovation and creativity.

3. SUMMARY OF ASSESSMENT

Apprentices on the Level 3 Composite Technician Standard are assessed throughout apprenticeship programme to ensure that the apprentices become competent Composites Technicians.

The Level 3 Composite Technician Standard has been designed to run over a period of 36-months and during this time in addition to on the job training the apprentice will undertake more formal training either in college or on-site. This formal training equates to around a day a week.

The flowchart below shows the assessment journey made by apprentices through the apprenticeship. It details what milestones (or 'gateways') apprentices should reach at various points throughout their training and how their abilities will be assessed at the end of the programme.



4. OVERVIEW OF THE END POINT ASSESSMENT

The apprenticeship standard describes the key KSBs that an apprentice should develop during the apprenticeship programme and the assessment plan identified how these should be assessed in the EPA.

The assessment plan details what milestones (or 'gateways') apprentices should reach at various points throughout their training and how their abilities will be assessed at the end of the programme. This final assessment is known as EPA.

During the EPA, the apprentice must demonstrate their capability to perform their role to a consistent national standard and the methods used to test this vary from standard to standard.

An independent registered End Point Assessment Organisation (EPAO) will perform this perform this EPA and not the employer or training provider. PIABC Limited (EPA0685) is a registered EPAO for the Level 3 Composite Technician Apprenticeship Standard (ST0094).

5. END POINT ASSESSMENT STRUCTURE

The EPA for Level 3 Composites Technician Apprenticeship consists of two parts:

EPA1: WORK-BASED PROJECT

The apprentices undertake a work-based project during the last six months of the programme and submit a report (1,500 words) to the EPAO for review by a panel of assessors. This work-based project can be started by the apprentice before the gateway.

This report will enable the apprentice to demonstrate specific work-related tasks that they have completed in order to demonstrate how they have achieved the KSBs and professional competence set out in the Level 3 Composites Technician Standard and for registration as an Engineering Technician (EngTech) by a relevant Professional Engineering Institution (PEI), such as IOM3.

The report will also give the apprentice the opportunity to demonstrate to the end point assessment panel that they understand the company in terms of their products, processes, procedures, tools, equipment, materials, documentation, and information systems by showcasing what they have done, what they have learnt and how they have applied this knowledge and skills to real work tasks including solving composites related problems.

EPA2: A PROFESSIONAL DISCUSSION

The apprentice will attend a professional discussion (including viva on the work-based project), which will allow the EPA panel makes sure that all the KSBs have been demonstrated to the required level and competency.

The panel is comprised of:

- (Lead) Independent End Point Assessor – someone with experience in the composites field that holds a recognised assessment qualification. This person is the Chair of the panel.
- Professional body assessor – someone that is a member of Institute of Materials, Minerals and Mining (IOM3) with significant experience of working within the composites sector.
- A composite engineer from the apprentice's employer who has not had any previous involvement with the apprentice's training. This employer representative on the panel is there to clarify any points related to work, to observe the process, and to support the apprentice. The employer representative is not involved in the pre/post EPA discussions as inclusion

could be identified as a conflict of interest in the possibility of influencing a positive outcome for the employer.

It will be a 60-minute discussion, which will include a viva based on the work-based project report produced by the apprentice. The panel will use the report as a basis for testing the KSBs of the apprentice as set out in the standard (see Section 6).

Professional discussion is an in-depth, planned, two-way discussion pitched at the relevant standard level. It is not a chat or a question and answers session. Typically, the professional discussion is an opportunity for the apprentice to describe their apprenticeship journey and explain how they have applied their learning and developed their professional behaviours.

Professional discussions are designed to assess the breadth of understanding of the standards. The panel's questions will be formulated to extend the apprentice's critical thinking, getting them to evaluate previous performance, alternative actions and identify learning and changes they have made to improve their performance.

Professional discussions can also be used to plug gaps in work-based projects.

At the opening of the professional discussion the apprentices should be invited to give a viva on their work-based project. The next part of the session will focus on the coverage of the standard. This is where the apprentice will be asked about the areas of the standard that are not covered in the work-based project or where additional evidence is required to make sure all the KSBs have been demonstrate to the required level and competence.

The discussion will focus on all the components of the Level 3 Composite Technician Standard, which will enable the panel to make a judgement of the apprentice's occupational competence. It is a structured and formal discussion between the apprentice and the panel, drawing upon information supplied in the report. It covers both what tasks the apprentice has completed in the workplace, the standard of their work, and the behaviours they have demonstrated throughout, such as, being a team player, having a positive attitude, a strong work ethic, being a responsible employee, self-motivation and a proven commitment to the organisation. This enables the EPA to cover a broad range of knowledge and understanding, skills and behaviours.

The assessment of behaviours will require the apprentice to demonstrate as part of their viva:

- appropriate safety behaviours, individually and towards others
- a commitment to quality and continuous improvement
- a strong work ethic, including being motivated, reliable, and proactive
- an ability to work individually and as part of a team
- a recognition and understanding of diversity and equality in the workplace
- an ability to communicate effectively at all levels in the organization
- effective time management including prioritisation of work
- a desire to continually learn

IfATE states that behaviours in the context of standards are: *"Behaviours are mind sets, attitudes or approaches required for competence, generally across the entire occupation. While these can be innate or instinctive, they can also be learnt, so they are effectively a subset of skills. Behaviours tend to be very transferable meaning that, at any one level, they may be more similar across apprenticeship standards than knowledge and skills."*

It will also be an opportunity for the panel to:

- clarify any points and/or probe the apprentice on the information they have presented in their report
- confirm and validate that the report is the apprentices' own work
- confirm and validate the judgements about the quality of the work the apprentice has completed

- explore areas of work presented in the report, how it was carried out, any problems that they encountered and how these were resolved
- validate the apprentice's skills and knowledge and understanding of the company in terms of their products, processes, procedures, tools, equipment, materials, documentation, and information systems
- elicit the apprentice's depth and breadth of understanding of the professional competence requirements for an Engineering Technician (EngTech)
- explore detail learnt on the apprentice's Level 3 Composites Technician Technical Certificate where the work-based project and other evidence has not covered all the KSBs

6. KNOWLEDGE, SKILLS AND BEHAVIOURS (KSBs)

The Level 3 Composite Technician apprenticeship standard states that all technicians employed in the composites sector will need to develop specialist KSBs. These KSBs will be generic and/or technology specific, but the subject areas indicated below will provide a foundation for an apprentice development in composites manufacture.

The EPA provides apprentice with a showcase opportunity to provide oral and documentary evidence of their KSBs developed throughout the apprenticeship in a synoptic way. It enables the EPA panel to test the KSBs acquired by the apprentice throughout the apprenticeship.

The KSBs of the of the Level 3 Composite Technician apprenticeship standard are set out below:

KNOWLEDGE
A composites technician will require a thorough understanding of the industry in which they are employed. They will be able to understand and apply the following areas:

- Working safely, appropriately, and collaboratively.
- Equality & Diversity.
- Maths, science, and engineering disciplines.
- The characteristics of composites and their various applications.
- Composite materials and consumables
- Types of resins (e.g. polyester, epoxy, bio-resins).
- The manufacture of materials (e.g. semi-finished, woven reinforcements, preforms.
- Material science, design, tooling, moulding, laminating, curing, testing, inspection & repair.
- Hand lay-up (e.g. open moulding, spray lay-up).
- Automated lay-up (e.g. automated fibre placement, automated tape layup).
- The manufacture of complex parts (e.g. airplane wings, body armour, turbine blades).
- Quality, Cost and Delivery (QCD) standards and their importance in the workplace.
- Manufacturing costs and the need for preventative maintenance.
- Business improvement techniques and waste reduction.
- Application of IT systems to support manufacture (including CAD/CAM/CMM).
- Automation techniques including programming and operating robots.
- Supporting R & D projects.
- New Product Development (NPD).

SKILLS
A composites technician will develop skills in the disciplines of design, mould tool making and preparation, part lay-up, curing, testing, inspection, repair, and material science. They will be able to:

- Select appropriate techniques, procedures, and methods to undertake part manufacture.
- Identify and select materials (resins, matrix, and core).
- Design and prepare mould tools.
- Design and manufacture components.

- Select appropriate consumables required to ensure satisfactory progress and completion of projects and/or manufacturing programmes, in conjunction with any relevant Health and Safety legislation.
- Read and understand technical drawings for part manufacture.
- Laminate geometrically complex parts.
- Operate machinery associated with laminating and automated manufacture.
- Carry out maintenance to machines or equipment to comply with preventative maintenance plans.
- Assist and advise in the planning and preparation of manufacturing programmes and research projects to ensure they meet customer requirements and schedules.
- Understand and follow work instructions.
- Use metrology equipment applicable to the workplace.

BEHAVIOUR
The behaviour of technicians in the composites industry is one of the most important aspects of the standard. Composites technicians will be expected to:

- Manage and apply safe systems of work, ethically and responsibly.
- Show respect for colleagues and the work environment.
- Be focused on customer satisfaction, ensuring that work is undertaken following QCD principles to meet or exceed customers' expectations.
- Have a "right first time" approach.
- Understand and implement continuous improvements in the workplace.
- Solve problems, eliminate waste and risks.
- Undertake engineering activities which contribute to sustainable development.
- Be able to work in a team with effective interpersonal skills.
- Be able to communicate clearly.
- Commit to & apply a professional code of conduct.
- Carry out continuous professional development activities and have a desire to develop a career in composites engineering.

7. GRADING

A pass or fail grade will only be awarded to apprentices on the Level 3 Composite Technician apprenticeship as a grading exemption has been granted due to its link to professional registration.

A pass will mean the apprentice has successfully completed the apprenticeship and has met the requirements for EngTech. On successful completion the apprentice will be ready to apply for EngTech with a Professional Engineering Institute (PEI), such as IOM3.

8. ASSESSMENT CONTROLS

An overview of the assessment controls which apply to the EPA detailed in the table below:

Control Description	**Conditions**
EPA1: Work-Based Project submission	PIABC Limited stipulates that the work-based project is submitted to PIABC Limited in PDF format one month before the date of EPA2: Professional Discussion.
Punctuality and timing	All apprentices must be on time for the start of their professional discussion. It is recommended that apprentices arrive at least 30 minutes before its scheduled start. In instances where the apprentice may arrive late, the apprentice must inform their training provider as soon as possible so the (Lead) Independent End Point

	Assessor ((L)IEPA) is aware. Where possible, the (L)IEPA will aim to accommodate the apprentice, but not at the cost of disrupting other scheduled professional discussions.
Venue environment	The professional discussion must take place in suitable room that should be well lit, noise free and without visible distractions. If on arrival the (L)IEPA deems the room environment unsuitable, then the professional discussion maybe delayed or cancelled. Ensure appropriate environment meets health & safety requirements.
Mobile phones and tablets	The use of mobile phones and other electronic devices at the professional discussion by the apprentice is prohibited. All panel devices must also be switched off, exception to this rule is when a device is being used to record or film the professional discussion.
Identification confirmation	Apprentices must bring personal photographic identification (e.g. passport or driving licence), which must be checked before proceeding with the professional discussion. Details must be recorded on the professional discussion form by the (L)IEPA.
Collaboration	Whilst apprentices can work with their training providers in groups as part of the on-programme stage of the apprenticeship; the EPA itself is an assessment of individual apprentice and does not allow collaboration between apprentices. The employer representative on the panel is not to discuss the apprentice's performance or provide any advice during the professional discussion. If the (L)IEPA feels collaboration rules are breached, then the apprentice's EPA will be ended.
Dress code	Apprentices are expected to look smart or wear their work uniform on the day of the professional discussion. This must be in accordance with health and safety requirements of the venue (e.g. no open toe shoes).
Equipment & technology	Any equipment and technology that required is available and in full working order, to demonstrate the apprentice's KSBs.

9. EPA1: WORK-BASED PROJECT ASSESSMENT FORM

Level 3 Composites Technician (ST0094)
EPA1: WORK-BASED PROJECT ASSESSMENT FORM

Apprentice's Full Name	
Apprentice's ULN	
Date Submitted	
Date Assessed	

Please use this checklist to establish which aspects of knowledge, skills, and behaviour from Level 3 Composites Technician Standard (ST0094) have been demonstrated and evidenced effectively through the work-based project. Those marked X (i.e. not demonstrated/evidenced) must be explored in more detail within EPA2: Professional Discussion.

A. KNOWLEDGE

An apprentice will be required to have a thorough understanding of the industry in which they are employed.

	Demonstrates understanding and be able to apply knowledge of:	√	X	**Comment**
01	Working safely, appropriately, and collaboratively			
02	Equality and diversity			
03	Characteristics of composites and their various applications			
04	Composite materials and consumables			
05	The types of resins (e.g. Polyester, Epoxy, Bio-resins)			
06	The manufacture of materials (e.g. Semi-finished, woven reinforcements, preforms)			
07	The material science, design, tooling, moulding, laminating, curing, testing, inspection & repair			
08	The hand lay-up (e.g. open moulding, spray lay-up)			
09	The automated lay-up (e.g. automated fibre placement, automated tape layup)			
10	The manufacture of complex parts (e.g. airplane wings, body armour, turbine blades)			
11	Quality, Cost and Delivery (QCD) standards and their importance in the workplace			
12	The manufacturing costs and the need for preventative maintenance			

13	Business improvement techniques and waste reduction			
14	Application of IT systems to support manufacture (including CAD/CAM/CMM)			
15	Automation techniques including programming and operating robots			
16	Supporting research and development projects			
17	The New Product Development (NPD)			
Overall Comments				

B. SKILLS

An apprentice will need the skills in the disciplines of design, mould tool making and preparation, part lay-up, curing, testing, inspection, repair, and material science.

Demonstrates understanding and be able to apply skills to:		√	X	**Comment**
01	Select appropriate techniques, procedures, and methods to undertake part manufacture.			
02	Identify and select materials (e.g. resins, matrix, and core)			
03	Design and prepare mould tools			
04	Design and manufacture components			
05	Select appropriate consumables required to ensure satisfactory progress and completion of projects and/or manufacturing programmes, in conjunction with any relevant Health and Safety legislation.			
06	Read and understand technical drawings for part manufacture			
07	Laminate geometrically complex parts			
08	Operate machinery associated with laminating and automated manufacture			
09	Carry out maintenance to machines or equipment to comply with preventative maintenance plans			
10	Assist and advise in the planning and preparation of manufacturing programmes and research projects to ensure they meet customer requirements and schedules			
11	Understand and follow work instructions			
12	Use metrology equipment applicable to the workplace			
Overall Comments				

C. BEHAVIOURS

The behaviour is one of the most important aspects for an apprentice to demonstrate.

Demonstrates behaviour by:		√	X	**Comment**
01	Managing and applying safe systems of work, ethically and responsibly			
02	Showing respect for colleagues and the work environment			
03	Being focused on customer satisfaction, ensuring that work is undertaken following Quality, Cost and Delivery principles to meet or exceed customers' expectations			
04	Having a "right first time" approach			
05	Understanding and implementing continuous improvements in the workplace			
06	Solving problems, eliminating waste and risks			
07	Undertaking engineering activities which contribute to sustainable development			
08	Being able to work in a team with effective interpersonal skills			
09	Being able to communicate clearly			
10	Committing to & applying a professional code of conduct			
11	Carrying out CPD activities and have a desire to develop a career in composites engineering			
Overall Comments				

Form completed by (tick as applicable):			
EPAO (L)IEPA		Professional Body Assessor	
Full Name			
Signature			
Date			

10. EPA2: PROFESSIONAL DISCUSSION ASSESSMENT FORM

Level 3 Composites Technician (ST0094)
EPA2: PROFESSIONAL DISCUSSION ASSESSMENT FORM

Apprentice's Full Name	
Apprentice's ULN	
Date of Professional Discussion	
Location of Professional Discussion	

Please use this checklist to establish which aspects of knowledge, skills, and behaviour from Level 3 Composites Technician Standard (ST0094) have been demonstrated and evidenced effectively through the professional discussion.

A. KNOWLEDGE

An apprentice will be required to have a thorough understanding of the industry in which they are employed.

	Demonstrates understanding and be able to apply knowledge of:	√	X	**Comment**
01	Working safely, appropriately, and collaboratively			
02	Equality and diversity			
03	Characteristics of composites and their various applications			
04	Composite materials and consumables			
05	The types of resins (e.g. Polyester, Epoxy, Bio-resins)			
06	The manufacture of materials (e.g. Semi-finished, woven reinforcements, preforms)			
07	The material science, design, tooling, moulding, laminating, curing, testing, inspection & repair			
08	The hand lay-up (e.g. open moulding, spray lay-up)			
09	The automated lay-up (e.g. automated fibre placement, automated tape layup)			
10	The manufacture of complex parts (e.g. airplane wings, body armour, turbine blades)			
11	Quality, Cost and Delivery (QCD) standards and their importance in the workplace			
12	The manufacturing costs and the need for preventative maintenance			
13	Business improvement techniques and waste reduction			

14	Application of IT systems to support manufacture (including CAD/CAM/CMM)			
15	Automation techniques including programming and operating robots			
16	Supporting research and development projects			
17	The New Product Development (NPD)			
Overall Comments				

B. SKILLS

An apprentice will need the skills in the disciplines of design, mould tool making and preparation, part lay-up, curing, testing, inspection, repair, and material science.

Demonstrates understanding and be able to apply skills to:		√	X	**Comment**
01	Select appropriate techniques, procedures, and methods to undertake part manufacture.			
02	Identify and select materials (e.g. resins, matrix, and core)			
03	Design and prepare mould tools			
04	Design and manufacture components			
05	Select appropriate consumables required to ensure satisfactory progress and completion of projects and/or manufacturing programmes, in conjunction with any relevant Health and Safety legislation.			
06	Read and understand technical drawings for part manufacture			
07	Laminate geometrically complex parts			
08	Operate machinery associated with laminating and automated manufacture			
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10	Assist and advise in the planning and preparation of manufacturing programmes and research projects to ensure they meet customer requirements and schedules			
11	Understand and follow work instructions			
12	Use metrology equipment applicable to the workplace			
Overall Comments				

C. BEHAVIOURS

The behaviour is one of the most important aspects for an apprentice to demonstrate.

Demonstrates behaviour by:		√	X	**Comment**
01	Managing and applying safe systems of work, ethically and responsibly			
02	Showing respect for colleagues and the work environment			
03	Being focused on customer satisfaction, ensuring that work is undertaken following Quality, Cost and Delivery principles to meet or exceed customers' expectations			
04	Having a "right first time" approach			
05	Understanding and implementing continuous improvements in the workplace			
06	Solving problems, eliminating waste and risks			
07	Undertaking engineering activities which contribute to sustainable development			
08	Being able to work in a team with effective interpersonal skills			
09	Being able to communicate clearly			
10	Committing to & applying a professional code of conduct			
11	Carrying out CPD activities and have a desire to develop a career in composites engineering			
Overall Comments				

Form completed by (tick as applicable):			
EPAO (L)IEPA		Professional Body Assessor	
Full Name			
Signature			
Date			

11. RE-SITS/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.

The apprentice 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 either a re-sit or re-take is an appropriate course of action.

The apprentice, who fails an assessment method, and therefore the EPA in the first instance, will be required to re-sit or re-take any failed assessment methods only.

The timescales for a re-sit/re-take are agreed between the Employer, Main Contractor, and PIABC Limited. A re-sit is typically taken within 3 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 6 months of the EPA outcome notification.

12. ENQUIRIES & APPEALS ABOUT ASSESSMENT DECISIONS

There may be occasions where PIABC Limited make assessment decisions that the apprentice, employer or training provider do not agree with. Enquiries about assessment decisions can be submitted in relation to the following decisions made by the EPA team. This can be submitted once all EPAs have taken place and been given a final grade:

- decisions regarding special considerations
- quality assurance decisions

An enquiry about an assessment decision has two options:

- clerical check – a check that necessary information has been considered in the assessment decision
- re-assessment – a full review of the evidence and decision

Appeals
PIABC Limited's appeals process allows apprentice, employer or training provider to outline their views/grievances in relation to the results of an assessment, following the outcome of the enquiry about assessment decisions process, where apprentice, employer or training provider believe we did not apply our procedures consistently, properly or fairly.

The findings from the appeals process will enable an objective, factually based judgment to be reached.

For more information, please see *"End Point Assessment Service - The Appeals Process (for Appeals against PIABC Limited decisions)*", which is available on request from the EPA team.

13. PRIOR LEARNING

Recognised prior learning is not available for this end point assessment.

14. SUCCESSFUL COMPLETION OF THE END POINT ASSESSMENT

For an apprentice to pass the end point assessment (EPA) as a whole and be deemed to be competent, the apprentice must pass both EPA1: Work-Based Project and EPA2: Professional Discussion (which includes a viva based on the work-based project).

15. POLICIES & PROCEDURES

PIABC Limited policies and procedures are made available to employers, training providers and apprentices once the Service Level Agreement has been agreed.

List of End Point Assessment Service's policies and procedures:

- Anti-fraud Policy
- Complaints Handling Policy
- Conflict of Interest Policy
- English and Mathematics Policy and Guidance for End Point Assessment Gateway Evidence
- Enquiries and Appeals Policy
- Equality, Diversity, Inclusion and Discrimination Policy
- Fair Access Policy
- Fees and Cancellations Policy
- Internal Quality Assurance Policy
- Invigilation Policy
- Malpractice and Maladministration Policy
- Prevent Agenda Policy
- Reasonable Adjustments Policy
- Safeguarding and Disclosure and Barring Service (DBS) Policy
- Sanctions Policy
- The Appeals Process (for Appeals against PIABC Limited decisions)
- Whistleblowing Policy

Copies of these policies and procedures are available from the EPA Team.

15. CONTACT DETAILS

If you have any queries about the contents of the specification, then please contact the EPA team at:

Email: piabc@iom3.org

Telephone: +44 (0)1476 513884

Post:
PIABC Limited
The Boilerhouse
Caunt Road
Grantham
NG31 7FZ

Website: www.piabc.org.uk