SIAS

Science Industry Process and Plant Engineer (Degree)

Level 6 Apprenticeship Standard (ST0473)

End-Point Assessment Specification

Endorsed by the Science Industry Partnership

SIP

Contents

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.**

Qualification Objective

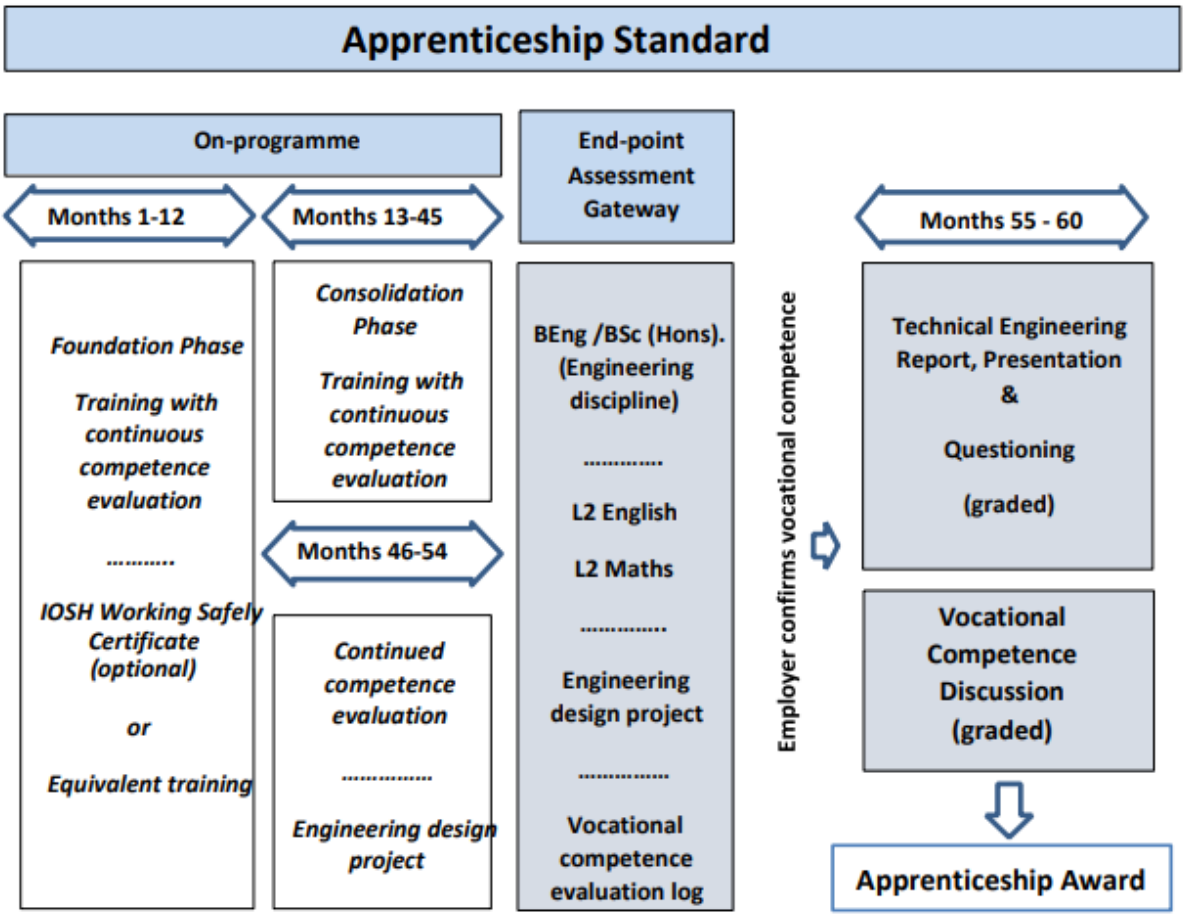
The aim of this qualification is to ensure that the apprentice is occupationally competent against the knowledge, skills and behaviours outlined in the assessment plan for this standard.

A Science industry process and plant engineer (SIPPE) will be involved in process design and manufacture of chemical, biological or science-based technology industrial or consumer products using solid, liquid and gaseous media. They will apply their knowledge of underlying engineering principles to implement and develop new processes or plant and to support product development; and work autonomously and as part of a wider scientific & engineering team. They will use project management skills to develop and manufacture products on time, on cost and to the right product quality. They will be proactive in identifying and supporting engineering solutions to challenging problems, be able to identify areas for business improvement and propose innovative ideas. In all contexts working safely and ethically is paramount and many companies operate under highly regulated conditions because of the need to control the quality of products and safety of their manufacture. Process specialists are involved in conception, design and operation of processes and may also be involved in pilot plant scale-up, manufacturing and packaging operations. Plant specialists ensure the plant, equipment and manufacturing assets are monitored and optimised to support the current and future processing operation whilst offering best value to the organisation. Both process and plant roles are critical to efficient manufacturing operations and they will frequently work together and will share a common set of skills that allows them to cover common aspects of their specialist roles.

Prior Learning and Qualifications

Typically candidates will have achieved grade C or above in at least five GCSE’s including English, Maths and a Science subject and hold relevant level 3 qualifications providing the appropriate number of UCAS points for HE entry. Other relevant or prior experience may also be considered as an alternative.

Overview



A Science industry process and plant engineer degree apprenticeship will typically require 54 months on-programme training/assessment to meet the requirements of the standard. Achievement of a BEng (Honours)/ BSc (Honours) degree is a gateway requirement for starting the EPA, along with English and maths at level 2 - achieved either before or during the apprenticeship, the completion of an engineering design project and a vocational competence evaluation (VCD) log (log). The employer must confirm that the apprentice has completed the gateway requirements and is ready for the EPA. The EPA must be conducted by an EPAO on the Register of End-point Assessment Organisations (RoEPAOs), which is approved to deliver EPA for this apprenticeship standard. The EPA consists of 2 assessment methods:

- technical engineering report, presentation & questioning
- vocational competence discussion

The assessment methods must be completed within a maximum 6-month period, after the EPA gateway.

Performance in the EPA will determine the apprenticeship grade – fail, pass or distinction. The apprentice must pass both EPA methods to successfully complete the apprenticeship.

Successful apprentices may be eligible to apply for Incorporated Engineer (IEng), through a relevant licensed (by Engineering Council) Professional Engineering Institution (PEI) e.g., IChemE, IMechE. This apprenticeship is aligned to Engineering Council UK-SPEC at Incorporated Engineer (IEng) standard.

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 end-point assessment. Confirmation from the employer that the apprentice is fully competent is needed before end-point assessment 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

Apprentices must complete the gateway requirements detailed below before taking the EPA.

- Science based Engineering Batchelor's Degree
- Engineering Design Project
- Vocational Competence Evaluation Log (CEL)
- English and Maths Level 2

Details of each of these are given below.

Science based Engineering Batchelor's Degree

Apprentices must complete a Bachelor's Degree in an engineering discipline; Chemical, Biochemical, Biomedical, Mechanical, Manufacturing, Process.

Example degrees include:

- BEng (Honours) Chemical Engineering
- BEng (Honours) Mechanical Engineering
- BEng (Honours) Process Engineering
- BEng (Honours) Biochemical Engineering
- BSc (Honours) Mechanical Engineering
- BSc (Honours) Chemical Engineering

The range of BEng (Honours) or BSc (Honours) degree qualifications that may be used allows employers/apprentices the flexibility to tailor the apprenticeship to meet their needs, whilst meeting the minimum requirements of the apprenticeship standard.

Engineering Design Project

The aim of the engineering design project is to allow the apprentice to apply their engineering knowledge to an open-ended problem. The project will provide the basis for the technical engineering report, presentation and questioning component of the EPA – all elements must be completed after the EPA gateway.

The engineering design project must allow the apprentice to critically identify, define, conceptualise and analyse complex/professional problems and issues. This will be a substantial piece of work showing the ability to apply a wide range of their principal professional skills, technical knowledge, design techniques and practices in the context of a real process and or plant engineering problem.

The project will focus on the technical engineering content; demonstrating personal involvement in the work; providing explanation of content and findings; and showing the analysis and evaluation of information and supporting data and references to any published academic papers. Typical project examples include:

- Design data and feasibility of constructing a new process or processing step
- A novel engineering solution to a process improvement or upgrade
- Design and installation of a new or upgrade utility or service

The project must cover the chemical, process and/or plant engineering issues, showing integration with other engineering and technical management disciplines to produce an appropriate total design or solution(s) for safe and useful application. The project must also demonstrate critical analysis of any appropriate engineering information, publications and own data and the development of investigative and work orientated skills. The scope of the project must cover, but need not be limited to:

1. Project scope, planning & resources
    a. Definition of the scientific business context to the design project including perceived advantages & limitations
    b. Clear project plan and predicted timescales
    c. Consideration of resources and regulations with particular attention to relevant process safety requirements, product quality and assessment of risk

2. Problem definition and data analysis
    a. Understanding of process/plant engineering drawings relevant to the problem statement
    b. Description of equipment and/or facilities involved, constraints and risks
    c. Analysis of scientific information, engineering data and design calculations pertinent to project

3. Design solution, implementation or simulation
    a. Presentation of design solution including updated engineering drawings/calculations and use of appropriate engineering informatics packages
    b. Documented implementation or simulation of proposed design solution including real/simulated data
    c. Predicted or actual processing equipment and plant performance

4. Business impact, results and conclusions
    a. Reporting of the results of the design implementation
    b. Business implications of the design solution including basic understanding of financial implications and an economic impact analysis
    c. Conclusions drawn including personal reflection on the project scope and definition

The engineering design project should be undertaken towards the end of the on-programme phase, once the majority of learning is complete. It must be of sufficient depth and complexity to require a minimum of 100 hours of work with an additional 50 hours for project reporting. However, the apprentice should not limit the scope of their project to meet this requirement. Because of the significance of the project, the employer and Higher Education Institution may work together with the apprentice to agree a project that is achievable within the employer's business constraints, meets the employer's expectations and has a level of HE challenge appropriate to a BEng (Hons) or BSc (Hons). The design project should be

conducted as part of an apprentice's normal engineering work. The apprentice may choose to use their design project completed as partial fulfilment of the BEng (Hons) or BSc (Hons). Collaboration between the employer and the HEI is encouraged, with mentoring support for the apprentice from both the employer and the HEI. The employer must confirm the project is the apprentice's own work.

Full details of project requirements and grading criteria can be found in the Technical Engineering Report, Presentation and Questioning section of this document.

Vocational Competence Evaluation Log (CEL)

A summary record of on-programme vocational competence evaluation, signed off by a technical expert nominated by the apprentice's employer, must be recorded in the CEL. This reflects the industry practice of competence management through on-going employer competence evaluation. The CEL may also be used to support professional recognition requirements.

The CEL must detail what evidence was used to confirm the apprentice demonstrated competence, where it was generated, how it was evaluated and by whom against all KSBs in the apprenticeship standard. There is no need to capture the evidence itself in the CEL. However, the CEL must provide a reference to where the evidence is held. Typical evidence may include for example, a course assessment portfolio, a company workbook, performance review record or certificate of training. During the vocational competence discussion, the apprentice must have the opportunity to refer to the CEL and evidence referenced within it to evidence their answers.

The signed CEL will be used as the evidence that the employer has confirmed the apprentice has developed all the knowledge, skills and behaviours (KSBs) defined in the apprenticeship standard. This must be provided to SIAS at gateway in order for EPA to go ahead.

English and Maths Level 2

Apprentices must hold a minimum of level 2 English and maths, achieved either before or during the apprenticeship, before completing the EPA. On completion of the gateway requirements, the employer must confirm the apprentice as ready for the EPA. SIAS will need to see evidence that the gateway requirements have been met.

Assessment Methods

The EPA consists of 2 assessment methods:

- technical engineering report, presentation & questioning
- vocational competence discussion

EPA methods must be successfully completed during a maximum 6-month period, after the EPA gateway.

This process should be planned to accommodate operations, apprentice, technical expert and End-point Assessor availability. Assessments may be consecutive or phased over this period. The assessment methods can be taken in any order; for cost efficiency it is recommended that they should take place on the same day however, that is not a requirement.

Tables showing the KSBs that will be assessed by each assessment method are included in the respective sections below.

Technical Engineering Report, Presentation and Questioning

The apprentice must submit a report based on their Engineering Design Project. The report must be started after gateway has been approved and must be submitted to SIAS within 2-months of the gateway approval date.

The technical engineering report must:

- show the ability to design a work-based independent investigation based on core engineering principles within environments that maybe highly regulated
- demonstrate innovative/creative-thinking and analytical skills
- cover project design, planning, methods, results, data analysis, evaluation, and use of information technology for example computer aided design and informatics
- include conclusions and recommendations
- provide references to alignment to business and financial considerations, engineering and scientific resources, technical data analysis reports, scientific and published engineering literature
- cover the business environment in which the company operates, including personal role within the organisation

The technical engineering report must contain a maximum 3000 words inclusive of main text, figures, tables and boxes and technical drawings but not including references.

The End-point Assessor must review the technical engineering report before the apprentice presents the technical engineering report to an EPA Panel. The report must meet the above points before the presentation and questioning is undertaken.

The presentation must cover:

- the defined engineering problem and data analysis within the business and regulatory context, including any relevant reference materials
- the complexity, challenge and understanding of the engineering design project and the safe and useful application of the design solution
- design approach taken to implementing a solution including safety, regulatory constraints and data analysis
- business implications and integration with other engineering and technical management disciplines to produce a total design solution (including the economics of the work, operating and investment cost)
- personal reflection and learning following project completion, including the demonstration of teamwork and leadership in the development of the project and report

The apprentice may choose to use presentation aids, such as PowerPoint, multimedia and video.

The End-point Assessor must ask the apprentice 6 open questions relating to the technical engineering report; follow up questions are allowed for clarification.

The question topics must cover:

- project scope, planning & resources
- problem definition, results, data analysis, challenging assumptions, drawing conclusions.

- design solutions, recommendations and implementations including design specifications of process, plant and/or equipment for new or modifications to a system
- business impact, conclusions and stakeholder management
- use of personal/professional skills

The presentation must last 25-30 minutes and the questioning 50-60 minutes. The presentation and questioning may be conducted via video-conferencing.

Grading Criteria – Technical Engineering Report, Presentation and questioning

Ref	Area of Standard	Fail	Pass	Distinction
K1 K2 K5	Engineering & regulatory reference materials and published information	Engineering & regulatory reference materials review lacks evidence and structure, uses outdated results or inappropriate engineering data	A systematic analysis of relevant engineering & regulatory information within a justified validity period	A critical analysis of relevant engineering & regulatory information across the science/engineering field evaluating the evidence in relevance to the design project
K2 K4 S18	Project scope, planning & resources	Lack of clarity on project scope and boundary definition ill defined, little demonstration of effective planning and resource allocation	Project scope and boundaries clearly defined to the engineering business context of the design project. Providing clear project plan and predicted timescales showing consideration of resources	Demonstrates high level of understanding of customer requirements. The project scope and boundaries are defined to allow predicted and unforeseen benefits of the design solution to be realised
K3 S14	Data analysis, use of information technology	Misinterprets data and uses inappropriate statistical tools to analyse data	Well-structured data analysis using at least one appropriate statistical tool or analytical technique to test engineering information, data and design using calculations pertinent to project such as probability distributions, significance testing & confidence limits, regression & correlation	Systematic data analysis using at least one appropriate advanced statistical tool or technique such as t-test, chi-square test, multivariate analysis, predictive models
K7 K6 S14 S17	Drawing conclusions, impacts on business and cost implications	Inapposite conclusions based on misinterpretation of engineering data, published reference materials and data and lack of consideration of business and cost implications	Reasoned conclusions based on appropriate engineering data analysis and consideration of business and cost implications	Clearly defined Engineering conclusions leading to logical recommendations for future projects. Conclusions drawn including personal reflection on the project scope and definition and future longer term business, cost benefits
S17 B20	Stakeholder management	Project communication is vague or poor, difficulty conveying meaning to others	Tools used to define project stakeholders internal & external to the project	Clear management of all stakeholders expectations and use

				of engineering judgement to influence project direction
K1 K2 S17	Project design within the science industry	Limited understanding of project design	Robust understanding of project design used to develop and justify engineering design approach	Advanced engineering analysis techniques used to define engineering design approach and project results
B22 B25	Project Recommendations	Unable to explain recommendations based on conclusions	Recommendations for immediate next steps justified with reference to conclusions	Logical recommendations for future projects linked to engineering design conclusions
B20	Presentation	Unable to effectively present technical project elements and personal viewpoints	Confident, articulate presentation. Able to respond to technical questioning with ability to respect opinion of others	Proactively seeks feedback to improve analysis and personal performance
S17 B23	Use of personal/professional skills	Overall approach to project does not demonstrate use of personal/professional skills and good working practices within the context of the work-based project activity	Overall approach to project demonstrates use of personal/professional skills and good working practices within the context of the work-based project activity	Builds working relationships between team and other groups. Demonstrates creative thinking to resolve obstacles and recommends improvements based on personal experience
B22	Teamwork & leadership	Unable to provide examples of challenging assumptions within a wide, multi-disciplinary project team and promoting change within the workplace	Provides examples of working autonomously and interacting effectively taking account of the impact of the work on others	Provides examples of leading change and challenging practice to improve own work and work of others
B25	Personal reflection and learning	Unable to demonstrate sufficient teamwork and leadership in the development of the project and report	Provides demonstration of good teamwork and leadership in the development of the project and report, demonstrates opportunities to learning and self-improvement	Provides examples of leading team to achieve project objectives demonstrating commitment to learning and self-improvement and support the development of others

A fail will be awarded where the apprentice demonstrates one or more of the fail criteria for the Technical Engineering Report, Presentation and Questioning KSBs.

A pass will be awarded where the apprentice achieves all the pass criteria for the Technical Engineering Report, Presentation and Questioning KSBs.

A distinction will be awarded where the apprentice achieves all the pass and distinction criterial for the Technical Engineering Report, Presentation and Questioning KSBs.

Knowledge, Skills and Behaviours – Technical Engineering Report, Presentation and questioning

KSB Ref	KSB Statement
Knowledge	
S1	Core engineering principles including mathematics and science and their application to relevant area of specialism.
S2	The product manufacturing process within the science industry.
S3	Principles of computer aided design; computer aided engineering and appropriate engineering informatics packages.
S4	Engineering project management procedures and how to incorporate these into the engineering/scientific work environment.
S5	The internal and external regulatory environment pertinent to the science sector.
S7	The business environment in which the company operates including personal role within the organisation, ethical practice and codes of conduct.
Skills	
S14	Work autonomously to analyse, interpret and evaluate engineering data, presenting the results and problem-solving approach clearly and concisely in written and oral form, using technology where appropriate to assist with and evaluate activities.
S17	Use creative thinking and problem solving to challenge assumptions, innovate, make new proposals and build on existing ideas
S18	Plan and prioritise process/plant tasks using project planning tools, review and evaluate progress against objectives and investigate alternative scenarios.
Behaviours	
S20	Communicate appropriately to a scientific and non-scientific audience.
S22	Work autonomously and interact effectively within a wide, multi-disciplinary team, understanding the impact of work on others, especially where related to workplace ethics, diversity and equality.
S23	Applies a logical thought process, being able to incorporate the ideas of others and quickly process information.
S25	Take responsibility for continuing personal and professional development, demonstrating commitment to learning and self-improvement and support the development of others as appropriate.

Vocational Competence Discussion

Apprentices must take part in a vocational competence discussion with an End-point Assessor, on a one-to-one basis.

End-point Assessors must ask 6 open competence-based questions, one relating to each of the categories below; follow up questions are allowed for clarification:

- application of process, plant and product and quality management processes
- legislative and regulatory engineering, process, safety and environment control
- good practice in using appropriate engineering and company procedures in a scientific manufacturing environment
- commissioning process of capital, maintenance, revenue projects, setting and meeting targets
- the introduction of new scientific and process/plant engineering technologies and practices
- continuous improvement and change management processes

The apprentice must answer each question with examples from their own practice. The apprentice must bring their log to the VCD and may refer to it and evidence referenced in it to support their answers.

Examples of these questions as follows:

- Describe what constitutes the quality management system in which your organisation operates and the role you play within that?
- Explain your understanding of continuous improvement within the Science Industry and illustrate using a relevant example, describing your role and tools used?
- Describe what ‘good practice’ is applicable to your organisation and how this impacts your role?
- What steps would you need to take on introduction of a new technology or novel process, what are the key considerations within the regulated environment?

Grading Criteria – Vocational Competence Discussion

Ref	Area of Standard	Fail	Pass	Distinction
K9 B19	Application of process, plant and product and quality management processes	Cannot explain the application of process, plant, product and quality management policies and procedures.	Explain the application of process, plant, product and quality management policies and procedures. Supports explanation with example from own practice	Explain how the application of process, plant, product and quality management policies and procedures by themselves and others impacts on the wider business. Supports explanation with example of impact on the business
K8 S10 S11 B19	Legislative and regulatory engineering, process, safety and environment control	Cannot explain impact of legislative and regulatory engineering, process, safety and environment control on own role	Explain legislative and regulatory engineering, process, safety and environment control Supports explanation with example from own practice	Explain how compliance with legislative and regulatory engineering, process, safety and environment control impacts on the wider business Supports explanation with example of impact on the business
S12 B21	Good practice in using appropriate engineering and company procedures in a scientific manufacturing environment	Cannot explain good practice in using appropriate engineering and company procedures in a scientific manufacturing environment	Explain good practice in using appropriate engineering and company procedures in a scientific manufacturing environment Supports explanation with example from own practice	Explain how good practice in using appropriate engineering and company procedures in a scientific manufacturing environment impacts on the wider business Supports explanation with example of impact on the business
K6 S13	Commissioning process of capital, maintenance, revenue projects, setting and meeting targets	Cannot explain commissioning process of capital, maintenance, revenue projects, setting and meeting targets	Explain commissioning process of capital, maintenance, revenue projects, setting and meeting targets Supports explanation with example from own practice	Explain how commissioning process of capital, maintenance, revenue projects, setting and meeting targets impacts on the wider business Supports explanation with example of impact on the business
S16	The introduction of new scientific and	Cannot explain the introduction of new scientific and process/plant	Explain the introduction of new scientific and process/plant	Explain how the introduction of new scientific and process/plant

	process/plant engineering technologies and practices	engineering technologies and practices	engineering technologies and practices Supports explanation with example from own practice	engineering technologies and practices impacts on the wider business Supports explanation with example of impact on the business
B24 S15	Continuous improvement and change management processes	Cannot explain continuous improvement and change management processes	Explain continuous improvement and change management processes Supports explanation with example from own practice	Explain how continuous improvement and change management processes impacts on the wider business Supports explanation with example of impact on the business

Fail = demonstrates one or more of the fail criteria in any of the discussion areas

Pass = achieves pass criteria in all of the discussion areas

Distinction = achieves pass and distinction criteria in all discussion areas

Knowledge, Skills and Behaviours – Vocational Competence Discussion

KSB Ref	KSB Statement
Knowledge	
S6	Industrial finance: capital and operating expenditure, particularly when applied to feasibility studies and comparison of competing tenders
S8	The principles of process and product safety and sustainability relevant to the sector.
S9	The principles of quality management processes relevant to the sector e.g., Good Manufacturing Practice (GMP), Quality Control (QC), Quality Assurance (QA).
Skills	
S10	Ensure the control, within own area of responsibility, of major accident hazards, health & safety, to statutory, mandatory and environmental standards.
S11	Ensure that targets are met and maintained, within own area of responsibility, whilst complying with defined company procedures and legislative requirements.
S12	Prepare for and perform process/plant engineering tasks using the appropriate techniques, procedures and methods.
S13	Support the evaluation, submission, planning, installation and commissioning of capital, maintenance and revenue projects to improve process performance.
S15	Apply continuous improvement techniques and support existing manufacturing principles to drive effectiveness and efficiency.
S16	Manage and/or support the introduction of new technologies and practices.
Behaviours	
S19	Have a safety and quality approach that ensures strict compliance and a disciplined, responsible attitude to mitigate and manage risk.
S21	Is reliable and shows integrity and respect for confidentiality on work related and personal matters, including appropriate use of social media and information systems.
S24	Handle and respond to change, adjusting to different conditions, technologies, situations and environments.

Final Grade

Performance in the EPA will determine the apprenticeship grade – fail, pass or distinction. The End-point Assessor must combine the results from each assessment method to determine the EPA/apprenticeship grade. Grades will not be confirmed until after moderation.

Report, Presentation and Questioning	Vocational Competence Discussion	Overall Grading
Fail	Any Grade	Fail
Any Grade	Fail	Fail
Pass	Pass	Pass
Pass	Distinction	Pass
Distinction	Pass	Pass
Distinction	Distinction	Distinction

Moderation

SIAS moderate End-point Assessors' EPA decisions. The EPA grade will not be confirmed until after moderation.

SIAS run induction training for technical experts and End-point Assessors covering the apprenticeship standard and assessment methodology.

Annual standardisation events are held for End-point Assessors to ensure consistency in the assessment practice and decisions.

SIAS must ensure End-point Assessors and technical experts meet the qualification and experience requirements detailed above.

Re-takes / re-sits

Apprentices who fail an assessment method(s) will be offered the opportunity to take a re-sit/retake. A resit does not require any further learning, whereas a re-take does. The employer will need to agree that a re-sit/re-take is an appropriate course of action. Any assessment method re-sit/retake must be taken during the maximum 6-month EPA period; otherwise, the entire EPA must be retaken. They are not offered to apprentices wishing to move from pass to distinction. Re-sits/retakes will not be awarded a grade higher than pass, unless the EPAO determines there were exceptional circumstances accounting for the fail. Apprentices should have a supportive action plan to prepare for the re-sit/re-take.

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 to the employer. The certificate confirms that the apprentice has passed the end-point assessment, has demonstrated full competency across the standard and is job-ready.

Registered End-point Assessor standard criteria

End-point Assessors must hold a current UK qualification for workplace vocational assessors or a Workplace Competence Assessor Award.

End-point Assessors must be competent in the occupational area they are assessing. This must be shown through the individual having achieved a qualification at a level higher than the level of the apprenticeship standard being assessed; or by holding professional recognition at a level equivalent to or higher than the registration level of the apprenticeship standard being assessed.

Individuals must be able to demonstrate they possess practical and up-to-date knowledge of current working practices, engineering, process safety or product quality regulations such as The Medicines and Healthcare Products Regulatory Agency (MHRA) or HSE the Control of Major Accident Hazards (COMAH) regulations appropriate to the sector in which they are carrying out assessment practice.

End-point Assessors must:

- Maintain a continuous, up-to-date, and accurate record of their CPD activities.
- Demonstrate that their CPD activities are a mixture of learning activities relevant to current or future practice.
- Seek to ensure that their CPD has benefited the quality of their practice.
- Seek to ensure that their CPD has benefited the users of their work.

- Present a written profile containing evidence of at least 2 days CPD in the last 12 months on request.
- complete an SIAS induction to demonstrate working knowledge of the apprenticeship standard and assessment methodology.

There may be a requirement to hold additional specialist training or security clearance as required by the industry sector.

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:	
Technical Engineering Report, Presentation & Questioning	TER/PQ
Vocational Competence Discussion	VCD

KSB Ref	KSB Statement	
Knowledge		
S1	Core engineering principles including mathematics and science and their application to relevant area of specialism.	TER/PQ
S2	The product manufacturing process within the science industry.	TER/PQ
S3	Principles of computer aided design; computer aided engineering and appropriate engineering informatics packages.	TER/PQ
S4	Engineering project management procedures and how to incorporate these into the engineering/scientific work environment.	TER/PQ
S5	The internal and external regulatory environment pertinent to the science sector.	TER/PQ
S6	Industrial finance: capital and operating expenditure, particularly when applied to feasibility studies and comparison of competing tenders	VCD
S7	The business environment in which the company operates including personal role within the organisation, ethical practice and codes of conduct.	TER/PQ
S8	The principles of process and product safety and sustainability relevant to the sector.	VCD
S9	The principles of quality management processes relevant to the sector e.g., Good Manufacturing Practice (GMP), Quality Control (QC), Quality Assurance (QA).	VCD
Skills		
S10	Ensure the control, within own area of responsibility, of major accident hazards, health & safety, to statutory, mandatory and environmental standards.	VCD
S11	Ensure that targets are met and maintained, within own area of responsibility, whilst complying with defined company procedures and legislative requirements.	VCD
S12	Prepare for and perform process/plant engineering tasks using the appropriate techniques, procedures and methods.	VCD

S13	Support the evaluation, submission, planning, installation and commissioning of capital, maintenance and revenue projects to improve process performance.	VCD
S14	Work autonomously to analyse, interpret and evaluate engineering data, presenting the results and problem-solving approach clearly and concisely in written and oral form, using technology where appropriate to assist with and evaluate activities.	TER/PQ
S15	Apply continuous improvement techniques and support existing manufacturing principles to drive effectiveness and efficiency.	VCD
S16	Manage and/or support the introduction of new technologies and practices.	VCD
S17	Use creative thinking and problem solving to challenge assumptions, innovate, make new proposals and build on existing ideas	TER/PQ
S18	Plan and prioritise process/plant tasks using project planning tools, review and evaluate progress against objectives and investigate alternative scenarios.	TER/PQ
Behaviours		
S19	Have a safety and quality approach that ensures strict compliance and a disciplined, responsible attitude to mitigate and manage risk.	VCD
S20	Communicate appropriately to a scientific and non-scientific audience.	TER/PQ
S21	Is reliable and shows integrity and respect for confidentiality on work related and personal matters, including appropriate use of social media and information systems.	VCD
S22	Work autonomously and interact effectively within a wide, multi-disciplinary team, understanding the impact of work on others, especially where related to workplace ethics, diversity and equality.	TER/PQ
S23	Applies a logical thought process, being able to incorporate the ideas of others and quickly process information.	TER/PQ
S24	Handle and respond to change, adjusting to different conditions, technologies, situations and environments.	VCD
S25	Take responsibility for continuing personal and professional development, demonstrating commitment to learning and self-improvement and support the development of others as appropriate.	TER/PQ

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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