ENERGY & UTILITIES
INDEPENDENT
ASSESSMENT SERVICE

EPA Specification Engineering Construction Pipefitter

Contents

L3 EPA Engineering Construction Pipefitter

EPA Specification Section 1 – Introduction

Contacts

This specification has been designed to provide all the advice and guidance you need to prepare yourself and your apprentices for endpoint assessment. However, if you have any further questions please contact the EUIAS Help Desk using one of the following:

Help Desk email: enquiries@euias.co.uk
Help Desk telephone: 0121 713 8310

About the Energy and Utilities Independent Assessment Service (EUIAS)

The EUIAS is an independent End-point Assessment organisation (EPAO) approved by the Education and Skills Funding Agency (ESFA) (number EPA0009) to offer and carry out the end-point assessments (EPA) for the Level 3 Engineering Construction Pipefitter Apprenticeship Standard (ST0162). This specification relates to assessment plan ST0162/AP02.

The EUIAS was established in 2014 and is part of Energy & Utility Skills Limited. The EUIAS delivers rigorous and robust apprenticeship end-point assessment services for the energy and utilities sector, and for technical and safety-critical sectors. In May 2016, The EUIAS became the first end-point assessment provider to have achievers on the English Trailblazer apprenticeship standards.

About End-point Assessment

End-point assessment is the term given to the assessments taken by apprentices at the end of their apprenticeship, and which must be passed in order for the apprentice to be awarded a certificate of achievement. Apprentices must be trained by training providers approved by the ESFA and their end-point assessments must be carried out by an EPAO approved by the ESFA. The assessment is designed, delivered, assessed and quality assured by the EPAO, with further external quality assurance provided by an external quality assurance (EQA) provider.

The EPA typically consists of three assessment components each of which must be passed in order to achieve an overall pass. For the Engineering Construction Pipefitter standard, the assessments are a knowledge test, a Practical Assessment and a structured professional review.

End-point assessment is based on two documents that have been written by an employer group – the Standard and the Assessment Plan, both of which can be found on the website of the Institute for Apprenticeships and Technical Education, www.instituteforapprenticeships.org.

The EPAO designs the assessments to cover the standard, while complying with the assessment plan. It is important for training providers supporting apprenticeships:

- to ensure their training programmes cover all the elements required by the standard
- to have access to suitable premises, plant, machinery and equipment for the Practical Assessment

How to Use this EPA Specification for Engineering Construction Pipefitter

Welcome to the EUIAS EPA Specification for the Engineering Construction Pipefitter (ECP) Apprenticeship Standard.

The EUIAS internally quality assures all end-point assessments in accordance with its IQA process and IfATE requirements. This standard is externally quality assured by ECITB on behalf of the IfATE.

This Specification is available from the EUIAS website (www.euias.co.uk) as a complete document, and also in its individual sections to allow customers to download what they require.

Important: the web site will always contain the latest version of this document so please check back to ensure you are using the latest version.

This Specification outlines what you need to know about the end-point assessments for this standard and provides details of the on-programme delivery requirements. It provides advice and guidance for trainers on how to prepare apprentices for the end-point assessment.

The Specification provides end-to-end details of the how the EUIAS works with customers, from initial engagement to the completion of end-point assessment.

Audience:

Section 2 will be of interest mainly to the external quality assurance body to ensure the assessment methods cover the standard.

Section 3 will be of interest mainly to administrators and those responsible for planning and scheduling end-point assessments.

Section 4 will be of interest to those ensuring that apprentices have covered all the required elements of the standard during their apprenticeship, and to apprentices themselves.

Sections 5 and 6 will be of interest to those who support apprentices in preparing for the end-point assessments, and to apprentices themselves.

At a glance

Apprenticeship standard: Engineering Construction Pipefitter

Assessment Plan: ST0162/AP02

Level: 3

On-programme duration: Typically, 36 months

Grading: Fail/pass/merit/distinction

End-point Assessment methods:

- Knowledge Test
- Practical Assessment
- Structured Professional Review*

* This standard has been designed to align with the requirements of the Engineering Council's Professional Standards as detailed in the UKSPEC at Engineering Technician (Eng Tech) level. For the Structured Professional Review apprentices draw together and present their evidence, referencing the five UKSPEC areas of competence. Further details are provided in the Structured Professional Review section (Section 5.3) of this specification.

Quality Assurance:

Quality assurance of the end-point assessment is designed in accordance with the Assessment Plan. The main features of EUIAS quality assurance are:

- Assessments carried out by assessors standardised by EUIAS
- Ongoing internal quality assurance
- Moderation and final grading by EUIAS

External quality assurance is provided by ECITB on behalf of the IfATE.

In this guide, you will find:

- Detailed amplification and guidance of the standard and guidance on how to prepare the apprentice for gateway
- Detailed information on which part of the standard is assessed by which assessment method
- A section focused on the end-point assessment method where the assessment criteria are presented in a format suitable for carrying out practice assessments
- Suggestions on how to prepare the apprentice for each part of the end-point assessment
- A practice test that you can use with apprentices.

Is this the right standard for you?

The Engineering Construction Pipefitter standard has been designed by the trailblazer group of employers for pipefitters specifically engaged in a variety of settings.

A substantial part of the assessment activity is the Practical Assessment where the apprentice competently demonstrates their skills required to perform their job role by completing a holistic pipefitting task which has to be secured to a rig, provided by EUIAS. The apprentice will secure the resulting pipe assembly to a rig. The rig will be provided by EUIAS. It is important that the setting provides the opportunity to cover all the requirements of the standard. It is essential that the employer and provider check that they have the right site with the right opportunities for the apprentice to cover all the requirements of the assessment. The apprentice will not be assessed on the job that they do but on the requirements of the standard.

Standard overview

The Engineering Construction Pipefitter works within strictly defined processes and procedures to exacting standards. The role includes positioning, assembly, fabrication, maintenance, repair and decommissioning of piping systems within Engineering Construction, on construction sites or at commercial fabrication facilities. This can include working in environments with systems that may carry water, steam, food, pharmaceutical, chemicals gas, hydrocarbons or fuel which may be used in cooling, heating, lubricating and other processes. The Pipefitter works with various pipe materials such as ferrous and non-ferrous metals, plastics and composites. These materials can vary from 15mmm to 1200mm in diameter and from 5 mm up to 75 mm in thickness dependent upon the content of the pipes and the operating pressures of the systems. The role requires the knowledge and skills to implement the specified method of jointing required within often complex piping systems. The Pipefitter must be able to work autonomously and as part of a team ensuring compliance with health, safety and environmental, processes and procedures. The Pipefitter must also work with other Engineering Construction occupations such as welders.

The apprentice would be expected in their job role to:

- comply with Health and Safety, Risk and Quality Requirements
- correctly select and safely use tools and equipment for the fabrication, assembly, installation and decommissioning of pipework components and systems
- plan, organise and undertake the fabrication, assembly, installation and decommissioning of pipework components and systems
- read, interpret and apply, engineering drawing information
- shape pipework components using hand and power tools to cut, drill, shape and finish components to the required tolerance, specification and standard
- assemble and install pipework using the appropriate methods, techniques and equipment in accordance with the specification including welded, threaded, bolted and clamp jointing solutions
- ensure the integrity of the joints in accordance with specifications, in line with specified quality procedures and to precise tolerances
- undertake the testing and inspection of the fabricated or installed pipework using appropriate techniques

- work with others and contribute to effective working relationships within the engineering construction environment
- apply techniques for the temporary or permanent removal of an engineering construction piping related system or component
- communicate by keeping others informed about work plans or activities which may affect them and seek assistance from others without causing undue disruption to normal work activities.

On-programme requirements

The employer or training provider should ensure that they have developed and can deliver a programme of training and learning that will enable the apprentice to develop the knowledge, skills and behaviours that will be assessed as part of this standard. The programme must cover all the knowledge, skills and behaviours of the standard.

The planning, organisation and delivery of the on-programme element of the apprenticeship is the responsibility of the employer or training provider and it is their responsibility to ensure they are compliant with all applicable regulations.

The programme of training for the Engineering Construction Pipefitter must be completed before being entering gateway and **must include**:

- **Completion of a Level 3 Diploma in Installing Engineering Construction Plant and Systems**
- **If not already held, English and Maths at Level 2 (or equivalent).**

For all roles it is recommended that throughout the period of learning and development, and at least monthly' the apprentice should meet with their training provider or employer to record their progress against the standard. At these reviews, the employer should:

- set learning and development goals
- track the apprentice's progress
- coordinate 20% of the apprentice's time being spent in off-the-job training.

The employer must satisfy themselves that the apprentice:

- has developed and demonstrated the knowledge, skills and behaviours as specified in the standard
- can successfully demonstrate their ability to work safely and competently as an Engineering Construction Pipefitter.

Once the apprentice is deemed competent, the relevant section(s) of the standard should be signed off by the on-programme assessor and employer.

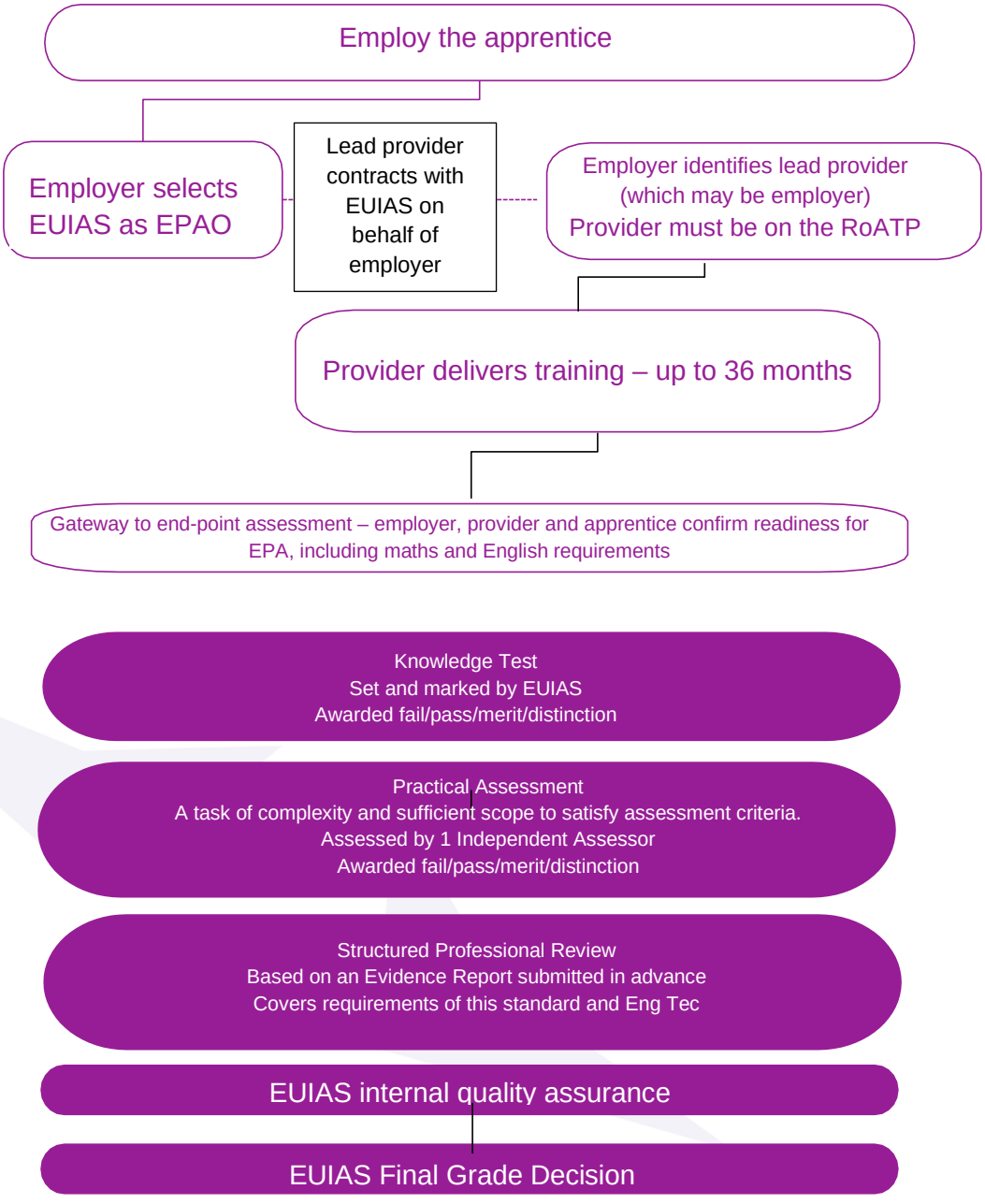
Readiness for end-point assessment

The apprentice must satisfy all requirements of the final gateway before entering end-point assessment:

- Achievement of the Level 3 Diploma in Installing Engineering Construction Plant and Systems -pipefitting pathway. EUIAS requires a copy of the certificate before end-point assessment can take place
- Achievement of Level 2 English and maths. EUIAS requires copies of the certificates before end-point assessment can take place
- The employer, training provider and apprentice must be confident that the apprentice has developed all the knowledge, skills and behaviours defined in the apprenticeship standard. To ensure this, the apprentice must attend a formal meeting with their employer to complete the Gateway Eligibility Report
- The apprentice and the employer must engage with the Service Delivery team at EUIAS to agree a schedule for each assessment activity to ensure all components can be completed within a 6-month assessment window. Further information about the gateway process in Section 3
- The employer, training provider and apprentice must be confident in ensuring that all EPA assessment completed documentation is uploaded to the EUIAS system as instructed by the Service Delivery Team

Order of end-point assessments

The successful completion of the Knowledge Test and Practical Assessment must precede the Structured Professional Review. The Knowledge Test and Practical Assessment may take place in any order, although the EUIAS will usually schedule the Knowledge Test first to allow time for any re-takes that may be needed. The final component is the Structured Professional Review. This will take place face to face and the apprentice will be given 2 months to complete the Structured Professional Review Evidence Report. The completed report must be submitted to EUIAS three-weeks before the Structured Professional Review is undertaken by the Independent Assessor



Overview of the EPA process – EPA-related activities in purple

L3 EPA Engineering Construction Pipefitter

EPA Specification Section 2 – Mapping the Standard

Contacts

This specification has been designed to provide all the advice and guidance you need to prepare yourself and your apprentices for endpoint assessment. However, if you have any further questions please contact the EUIAS Help Desk using one of the following:

Help Desk email: enquiries@euias.co.uk
Help Desk telephone: 0121 713 8310

Purpose

The purpose of this section is to introduce the elements of the standard and the referencing system used by the EUIAS. It provides and ‘at-a-glance’ view of which parts of the standard are assessed by which assessment method.

The Standard

The standard is divided into Knowledge, Skills and Behaviours.

Knowledge:

K1 Relevant health, safety and environmental legislation, regulations and company-specific requirements for safe working practises and procedures

K2 Importance and benefits of recognised Industry safety passport schemes

K3 How to work safely, personal site safety responsibilities and how to respond to and provide solutions to problems and emergencies

K4 Engineering practices and principles including reading engineering drawings and marking out techniques

K5 Mathematical techniques and formula related to the fabrication, development and installation of pipework systems

K6 How to correctly select and safely use hand tools, mechanical tools and equipment in differing environments for the fabrication, repair, installation and decommissioning of pipework systems

K7 Common and specialist pipe materials such as ferrous, non-ferrous and non-metallic including fittings associated with the pipework components and systems

K8 Pipework preparation, fabrication, installation, maintenance, testing and decommissioning techniques commonly used throughout the Engineering Construction industry

K9 Appropriate codes, practices and industry standards and their application to ensure quality requirements are met.

Skills:

S1 Comply with appropriate health and safety, risk and quality requirements

S2 Correctly select and safely use tools and equipment for the fabrication, assembly, installation and decommissioning of pipework components and systems

S3 Plan, organise and undertake the fabrication, assembly, installation, maintenance and decommissioning of pipework components and systems

S4 Read, interpret and apply engineering drawing information

S5 Shape pipework components using hand and power tools to cut, drill, shape and finish components to the required tolerance, specification and standard

S6 Assemble and install pipework using the appropriate methods, techniques and equipment in accordance with the specification including welded, threaded, bolted and clamped jointing solutions

S7 Ensure the integrity of joints in accordance with specifications, in line with specified quality procedures and to precise tolerances

S8 Undertake the testing and inspection of the fabricated and/or installed pipework using the appropriate techniques

S9 Work with others and contribute to effective working relationships within an Engineering Construction environment

S10 Apply techniques for the temporary or permanent removal of an engineering construction piping related system or component

S11 Communicate by keeping others informed about work plans or activities which may affect them and seek assistance from others without causing undue disruption to normal work activities.

Behaviours:

B1 Work with others to effectively and efficiently complete the allocated tasks

B2 Solve problems within their area of responsibility by applying technical skills and knowledge to define, identify, evaluate and select alternative solutions if required

B3 Take responsibility as an individual and team member for the quality of the work

B4 Support their own learning and development and that of others through activities such as mentoring and sharing of expertise and knowledge

B5 Act ethically, displaying maturity, honesty, integrity and responsibility

B6 Work safely in accordance with health, safety and environmental legislation, regulations and company-specific requirements

B7 Maintain a safe, clean and tidy work area

B8 Check for and identify potential hazards in the workplace and take collective responsibility to maintain a safe working environment

B9 Question unsafe behaviours and incorrect work practises and procedures.

The Knowledge, Skills and Behaviours statements are assessed in the End-point Assessment elements as follows.

Knowledge Test	Knowledge plus one skill and one behaviour (K1, K2, K3, K4, K5, K6, K7, K8, K9, S4, B7)
Practical Assessment	Knowledge (K4, K5, K6, K7, K8, K9)
	Skills (S1, S2, S3, S4, S5, S6, S7, S8, S10)
	Behaviours (B2, B3, B6, B7, B8)
Structured Professional Review	Knowledge (K1, K2, K3))
	Skills (S1, S2, S3, S4, S5, S6, S7, S8, S9, S10, S11)
	Behaviours (B1, B2, B3, B4, B5, B6, B7, B8 B9)

L3 EPA Engineering Construction Pipefitter

EPA Specification Section 3 – Service Delivery and Gateway Eligibility

- EUIAS Service Delivery
- How to prepare for gateway
- The Gateway meeting
- Timeline

Contacts

This specification has been designed to provide all the advice and guidance you need to prepare yourself and your apprentices for endpoint assessment. However, if you have any further questions please contact the EUIAS Help Desk using one of the following:

Help Desk email: enquiries@euias.co.uk
Help Desk telephone: 0121 713 8310

EUIAS Service Delivery

Whether you are an employer or a training provider (or both) your initial engagement will probably be with a business development manager who will introduce you to this document and take you through the EPA service that we offer. Our aim is to make the experience as straightforward and easy to engage with as possible.

The key to a successful EPA experience is early identification of requirements to enable proper planning to take place and this section explains the requirements for preparing for the Engineering Construction Pipefitter (ECP) EPA.

All the requirements discussed below are important, but some of them are critical, in particular the Gateway Eligibility Requirements. It is important to note that the end-point assessments cannot proceed without the Gateway Eligibility requirements being met. A completed Gateway Eligibility Report with supporting documents is required for each apprentice before EPA.

The EPA Window

All end-point assessments have a 'window' during which the end-point assessment must be completed, to avoid apprentices 'timing out'. The EPA window for the ECP standard is 36 - 42 months. The EPA window for each apprentice commences on the date they take the first element of their EPA, for example, the day of the Knowledge Test. All EPA activities must be completed within this 36 - 42-month window and EUIAS will work with you to schedule the EPA as close to the beginning of the window as possible to allow for re-sits if necessary.

Service Level Agreement (SLA) and Cohort Registration Form

EUIAS uses three documents to capture the details of the end-point assessment agreement:

- Service Level Agreement form – signed by provider
- Cohort Registration form – signed by the provider; this form identifies the apprentices in the cohort

The Cohort Registration Form includes a section where the employer formally appoints the EUIAS as their end-point assessment organisation for the named apprentices.

Initial Engagement

Initial engagement with EUIAS will usually take place well before the EPA is due to take place and sometimes before the apprentices start their programme. The initial engagement meeting will cover:

- The numbers of apprentices in the cohort
- Any Reasonable Adjustments you want to apply for
- The expected date(s) of EPA
- The employer and or lead provider for each apprentice
- Completion of the Service Level Agreement

- The location and invigilation of the Knowledge Test
- Compilation and submission of the 'Evidence Report' for the Structured Professional Review
- The location of the Structured Professional Review for the professional discussion with additional behavioural questions.

Further details of the assessment methods are in Section 5 of this EPA Specification.

The EUIAS operates a two-stage payment schedule:

- Stage One applies at the registration stage when the initial registration fee is due
- Stage Two applies at Gateway, when the balance of the agreed fee is due

During the initial engagement, we will also cover the support that is available for the employers and or training providers. We are confident that most, if not all the answers you need are contained within this Specification, but we are always available to provide answers to specific queries using the Help Desk email enquiries@euias.co.uk

Appointment and Registration

The appointment stage is the first formal stage of working with EUIAS. This stage must involve both the employer and the training provider (if applicable).

Successful appointment involves the completion of the Cohort Registration Form, officially appointing EUIAS as the EPAO for this cohort. The form contains

- Details of the training provider (if applicable)
- Confirmation of learner numbers and names
- Confirmation of expected EPA dates
- Confirmation of the level of service agreed with EUIAS, with pricing
- Confirmation that you will give a minimum of three months' notice of apprentices being ready for EPA (especially important if you bring forward the completion date)
- Signatures from both the employer and the training provider (if applicable)
- A purchase order from the lead-provider to EUIAS to the value agreed

If it has not already taken place, the details of the EPA will be discussed (as described in the Initial Engagement Section above) with the employer and training provider (if applicable) to agree roles and responsibilities.

On Programme

It is the responsibility of the training provider to create and deliver the apprentice training programme, ensuring you comply with the relevant ESFA rules. The EUIAS has no formal involvement in the 'on-programme' aspect of the apprenticeship. However, we DO provide guidance on how to put together the portfolio that is required for the Structured Professional Review. This can be found in Section 5.

We do appreciate that circumstances change so please notify us if:

- expected end-dates change, giving at least three months' notice of readiness for end-point assessment
- any cohort details change, especially if an apprentice drops off the programme
- any anticipated changes in venues for the end-point assessments.

Scheduling the end-point assessment

The EPA for ECP is very resource intensive, both in terms of availability of specialist settings for the Practical Assessment and in terms of availability of the specialist assessors that are required. The apprentices must be available for all assessments. Employer, training provider and EUIAS must keep in touch and notify each other of any changes as soon as they occur.

To help things run smoothly, you must inform EUIAS between 3 and 6 months before you expect to have your Gateway meetings with the cohort. The EUIAS Service Delivery team will be contacting you during this time, to facilitate two-way communication. Your proposed EPA date may be sooner than was originally anticipated at the time of registration, which is OK so long as the apprentice(s) has been on programme for at least a year.

We cannot confirm any EPA arrangements until we have confirmation of Gateway Eligibility Report, as discussed in the next section, but we will put together a provisional plan and share it with you. As a customer, you probably want to confirm Gateway Eligibility Report on one day and have the first end-point assessments the next day. The reality is that scheduling takes time and can take varying periods of time. The early notification helps us put together a provisional schedule, but we can only confirm it after Gateway Eligibility Report requirements are all met. The fewer changes you make to the information you give us three months before Gateway, the sooner it will be before we can start the EPA. We too commit to making last-minute changes as rare as possible.

We always aim to accommodate your requirements when scheduling, taking account of availability of apprentices, location and availability of assessment venues, availability of assessors and also ensuring that we have evidence of the pre-requisites, in particular level 2 English, Mathematics and level 3 Diploma in Installing Engineering Construction Plant and Systems.

As soon as possible after Gateway, EUIAS will confirm with you the end-point assessment arrangements for each apprentice in the cohort.

We will always try to schedule as soon as possible within the 6-month window, to allow time for any re-sits before the window closes.

How to prepare for gateway

On completion of their on-programme learning apprentices should be ready to pass through 'gateway' to their end-point assessment.

At this point, the employer, training provider and apprentice should hold a Gateway Eligibility meeting. The purpose of this meeting is to confirm that all parties agree the apprentice has met the requirements of the apprenticeship standard and is ready for end-point assessment. Note that the EUIAS is NOT present at this meeting. It is your sole responsibility to assure yourself, along with the training provider (if applicable) that the apprentice is ready for end-point assessment.

You are advised that the apprentice should prepare for this meeting by bringing along work-based evidence, including:

- mid and end-of-year performance reviews
- feedback to show how they have met the apprenticeship standards while on-programme.

Before the meeting, apprentices must have achieved:

- Level 3 Diploma in Installing Engineering Construction Plant and Systems – pipefitting pathway
- Level 2 English
- Level 2 maths.

Apprentices should be advised by employers and providers to gather this evidence throughout their on-programme training, **copies or scans of certificates WILL be required by EUIAS** before the apprentice can start EPA. Typically, the maths and English qualifications will be functional skills qualifications at Level 2 or GCSEs at grade C or above, or grade 4 and above.

It is recommended that employers and providers complete regular checks and reviews of this evidence to ensure the apprentice is progressing and achieving the standards before the gateway meeting is arranged.

The Gateway meeting

To comply with end-point assessment rules, EUIAS is not present at the Gateway meeting. Ideally it would be conducted with the apprentice, training provider and the employer present. Gateway meetings last about an hour and are completed on or after the apprenticeship on-programme end date.

During the meeting, the apprentice, employer and training provider will discuss the different aspects of the apprenticeship standard and confirm that the apprentice has met the full criteria of the apprenticeship standard during their on-programme training. A copy of standard and the assessment plan (ST0162/AP02) should be available at the meeting. In addition, the apprentice should be informed that EUIAS will be conducting the end-point assessment and that copies of the following policies are available on the EUIAS web site at euias.co.uk

- Appeals Policy
- Complaints Policy

At the meeting, the apprentice should be informed that they are required to have proof of their

identity with them for each end-point assessment element. EUIAS will accept the following as proof of identity:

- a valid passport
- a UK driving licence
- a valid warrant card issued by HM forces or uniformed services
- other photographic ID card such as an employee ID card or travel card.

At the meeting, the Gateway Eligibility Report (GER) below must be completed, agreed and signed by all 3 parties* and submitted to EUIAS at enquiries@euias.co.uk with the subject line "GER – apprentice name – provider name".

A completed GER form is required for every apprentice entered for end-point assessment.

*Where possible. We recognise that some meetings will take place at distance in which case an email agreement from the apprentice should be appended to the GER form.

The current ECP assessment plan (ST0162/AP02) does not prescribe the Gateway meeting, although it is good practice. The Gateway Eligibility Report is a requirement of EUIAS. If it is not possible to have the employer present at the time the Gateway Eligibility Form is completed by the apprentice and training provider, EUIAS will contact the employer to gain their signature.

Reasonable adjustments

If you wish to apply for reasonable adjustments on behalf of any of your apprentices, please do so at the same time as submitting the GER form, using the EUIAS Reasonable Adjustment Policy and Application that can be found at euias.co.uk

Re-sits and Re-takes

Any component that is failed can be re-sat within the EPA window. It is not possible to re-sit outside of the EPA window. If an apprentice is not successful, they can undertake a period of further training and re-take the failed components within a new EPA assessment window.

Timeline

Typical timeline in months, before and after the Gateway.

Initial engagement – typically 36 months before Gateway

Initial engagement, informal meeting between EUIAS and employer/training provider to agree:

- The numbers of apprentices in the cohort
- Any Reasonable Adjustments you want to apply for
- Expected location(s) for the Practical Assessment
- The expected date(s) of EPA
- The Training Provider

- The payment schedule
- Completion of Service Level Agreement (employer AND lead provider)

Registration - 36 months before Gateway to 6 months before Gateway

The apprentice is on-programme and compiling their portfolio of evidence to support the Structured Professional Review.

Formal Appointment/registration using the Cohort Registration form (Triggers Stage 1 payment) EUIAS:

- EUIAS will issue the Privacy Notice which must be shared with every apprentice in the cohort

Employer and training provider:

- Confirmation of expected EPA dates
- Confirmation of the level of service agreed with EUIAS, with pricing
- Confirmation that you will give three months' notice of apprentices being ready for EPA
- Completion of the Learner Submission form including each learner in the cohort
- A purchase order from the lead provider to EUIAS to the value agreed

Update calls (as agreed)

- EUIAS will periodically call designated contact to enquire about progress towards EPA
- EUIAS provides on-going support via enquiries@euias.co.uk
- Employer or training provider will give at least 6 months' notice of any proposed change to EPA dates

6 months before Gateway to Gateway

Employer or training provider provides details of Practical Assessment to EUIAS i.e. venue

3 months before Gateway to Gateway

- Employer or training provider to compile evidence of meeting eligibility requirements (Level 2 English and maths; Level 3 Diploma in Installing Engineering Construction Plant and Systems)
- Employer or training provider should also be arranging practice assessments for apprentices

Gateway

Employer and training provider:

- Provide completed Gateway Eligibility Report for each apprentice
- Ensure ALL eligibility requirements are met for each apprentice going forward to EPA
- Purchase order for Stage 2 payments

Gateway, and the 6-month EPA window

End-point Assessment window (Nb. 6-month window for each apprentice commences on the date of their first EPA activity)

The Knowledge Test and the Practical Assessment can be undertaken in any order, but we strongly recommend the Knowledge Test is carried out first. Our pricing is based on being able to test every apprentice in the cohort at the same time (Knowledge Test). **The Structured Professional Review must be the final assessment component.**

EUIAS:

- Schedule the assessments, in discussion with the employer/training provider
- Provides assessors for all assessment activities (unless otherwise agreed)
- Provides invigilator for Knowledge Test (if agreed in the price)
- Arranges re-sits within the 6-month EPA window, if required
- Carries out a final moderation to confirm grading decisions
- Will provide results of EPA with 11 days of final moderation

Employer or training provider:

- Ensures apprentices are briefed and prepared for EPA, including location and timings of assessments
- Ensures apprentices are preparing for the Structured Professional Review by collating evidence for their Evidence Report
- Ensures apprentices Evidence Report submitted to EUIAS at least 10 days before the Structured Professional Review
- Provides venue for the Knowledge Test (and re-sits if required)
- Provides access and details of venue for Practical Assessment, as previously agreed with EUIAS

NB. A re-take will be arranged, with the agreement of all parties, for apprentices who have failed an element or elements and are deemed to require further training before being ready for end-point assessment.

L3 EPA Engineering Construction Pipefitter

EPA Specification Section 4 – The MOET standard with Amplification and Guidance

Contacts

This specification has been designed to provide all the advice and guidance you need to prepare yourself and your apprentices for endpoint assessment. However, if you have any further questions please contact the EUIAS Help Desk using one of the following:

Help Desk email: enquiries@euias.co.uk
Help Desk telephone: 0121 713 8310

The Engineering Construction Pipefitter standard in detail

The Engineering Construction Pipefitter consists of:

- Knowledge (9 elements)
- Skills (11 elements)
- Behaviours (9 elements)

The following pages list each of the elements of the standard and additional amplification and guidance from EUIAS on the range and depth expected.

Knowledge
K1 Relevant health, safety and environmental legislation, regulations and company-specific requirements for safe working practices and procedures.
K2 Importance and benefits of recognised Industry safety passport schemes.
K3 How to work safely, personal site safety responsibilities and how to respond to and provide solutions to problems and emergencies.
K4 Engineering practices and principles including reading engineering drawings and marking out techniques.
K5 Mathematical techniques and formula related to the fabrication, development and installation of pipework systems.
K6 How to correctly select and safely use hand tools, mechanical tools and equipment in differing environments for the fabrication, repair, installation and decommissioning of pipework systems.
K7 Common and specialist pipe materials such as ferrous, non-ferrous and non-metallic including fittings associated with the pipework components and systems.
K8 Pipework preparation, fabrication, installation, maintenance, testing and decommissioning techniques commonly used throughout the Engineering Construction industry.
K9 Appropriate codes, practices and industry standards and their application to ensure quality requirements are met.

Knowledge: Amplification and Guidance
K1 Relevant health, safety and environmental legislation, regulations and company-specific requirements for safe working practices and procedures • Health and Safety at Work Act (HASAWA). To include employer and employee duties, PPE. • Noise at Work Regulations. To include employer and employee duties, PPE. • Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR). Considerations such as knowing what to do when an accident occurs; ensuring reporting takes place. • Control of Substances Hazardous to Health (COSHH). Considerations such as lubricating fluid for tools and equipment, coefficient lubricants for mechanical bolting e.g. Molykote and copperslip, cutting fluids, welding fume. • Classification, Labelling and Packaging (CLP) regulation. Considerations such as identification of basic labelling symbols, associated hazard, advice. • Provision and Use of Work Equipment Regulations (PUWER). Legislation regarding equipment such as grinders, hand tools, pipe benders, pressure testing equipment. • Personal Protective Equipment at Work Regulations. Considerations such as PPE must be visually examined, must be worn, used in accordance with the instructions, take reasonable care of it, report loss or defect. • Abrasive Wheels Regulations. Considerations such as HAVS, handheld grinders, hand/eye injuries, exposure limits (trigger times). • Lifting Operations and Lifting Equipment Regulations (LOLER). Considerations such as the safe use of lifting equipment, lifting operations colour coding. • Pressure testing procedures such as: HSE Guidelines (GS4 Safety in Pressure Testing), hydraulic and pneumatic tests, pumps, gauges, hoses, fittings, charts, pressure testing safety. • Environmental considerations such as: waste disposal management, environmental conditions (e.g. untidy workplace or poor ventilation).

Knowledge: Amplification and Guidance
• Manual handling considerations such as: manual handling risks, musculoskeletal disorders, kinetic lifting techniques, team lifting. • Method statements. Considerations such as: introduction and scope, key personnel, reference documents, any special requirements, detailed plan of execution, essential equipment, hazards, timing, emergency/environmental arrangements. • Risk assessments. Considerations such as generic risk assessments, task/personal risk assessments (e.g. time out for safety, point of work risk assessments, etc), limiting the exposure to risks by identifying all potential hazards then implementing adequate control measures, working at height. • Emergency procedures such as: raising the alarm, knowing your fire extinguishers, evacuation procedures, emergency actions, fire prevention, toxic alert systems, knowing where toxic refuges are. • First aid procedures such as: knowing who the nominated first aiders are, location of first aid provisions. • Pressure Systems Safety Regulations (PSSR) To include employer and employee duties. • Pressure Equipment Directive (PED). • Pressure Equipment Regulations (PER).
K2 Importance and benefits of recognised industry safety passport schemes • Ability to work safely on different sites. • Ensure competence of workers. • Accessibility to sites. • CCNSG (Client Contractor National Safety Group). • CSCS (Construction Skills Certificate Scheme). • ACE Card. (Assuring Competence in Engineering). • EMSS Card (Essential Minimum Safety Standards).

Knowledge: Amplification and Guidance
K3 How to work safely, personal site safety responsibilities and how to respond to and provide solutions to problems and emergencies • Health and Safety legislation such as: PUWER, HASAWA, LOLER, COSHH, RIDDOR. Consequences of not following legal Health and Safety responsibilities. • Company or site inductions such as: policies & procedures (such as drug & alcohol, mobile phones, fire & emergency procedures, first aid & medical facilities, site security, traffic and pedestrian management, minimum PPE requirements, loose clothing) • Risk assessments, permits, method statements. • Specific site safety procedures such as: evacuation procedures, muster points, safe havens, emergency phone numbers, alarms. • First Aid procedures such as first aid training, first aid, personnel. • Waste disposal management such as: the disposal of different types of waste including toxic, plastics, wood, metals in conjunction with the sites waste disposal management policy.
K4 Engineering practices and principles including reading engineering drawings and marking out techniques • Isometric Drawings, First and third angle projection drawings, 3D and CAD drawings. Information such as measurements, pipe size, fittings, outside diameters, tolerances, pipe falls, coordinates and elevations, hatch lines, penetrations, flows, BOM. (Bill of Materials), specifications, Non-Destructive Examination requirements (NDE), pressure testing requirements, Welding Procedure Specification (WPS), bolt hole orientation, in line item symbols, in line item orientation, pipe off sets and rolling offsets. • Piping and Instrument Diagrams (P&ID) such as: symbols, instrumentation, process flows, isolations, branches, reducers. • General Arrangements. (GA) such as: locations, overall compositions, structures. • Branch Making such as: templates, formulae, equal and unequal, square and lateral, tools and equipment. • Datum Lines such as: pipe centre lines, segmenting a pipe, tolerances, references, measurements, dimensions.
K5 Mathematical techniques and formula related to the fabrication, development and installation of pipework systems

Knowledge: Amplification and Guidance
• Surface areas, circumferences, section areas, pipe diameter, pipe weights, cut lengths of pipe, volume of a cylinder, trigonometry, triangle formulas. • Branch pattern development such as: template drawings, development formulae, datum lines, mitres. • Offsets, rolled offsets such as: run, travel, roll, angles, formulas. • Torque values for controlled bolting such as: torque settings, bolts, gaskets, flanges, lubricants, co-efficient, k factor. • Knowledge of calculations (but not the calculation) for safe distances in pressure testing, pressure, fittings.
K6 How to correctly select and safely use hand tools, mechanical tools and equipment in differing environments for the fabrication, repair, installation and decommissioning of pipework systems • Marking out tools such as scribes, centre punches, Vernier callipers, line of chords, set/plate square, chalk line. • Suitable surfaces such as: template paper, suitable clean benches and floors. • Hand tools such as: files, saws, hammers, centre, levels, spanners, wraparounds, protractor, pipe stands, alignment tools, nut splitters, pipe wrenches. • Mechanical tools and equipment such as: grinders, internal grinders, prepping machines, band saws, sanders, drills, hydraulic pipe bending machines, threading machines, impact wrenches, oxy fuel cutting equipment. • Lifting equipment such as: slings, blocks, pull lifts, shackles. • Mechanical joint integrity tools such as: torque wrenches, backing spanners, tensioning tools. • Pressure testing equipment such as: test rig, gauges, pumps, hoses, valves, graphs, charts.
K7 Common and specialist pipe materials such as ferrous, non-ferrous and non-metallic including fittings associated with the pipework components and systems To include the properties and heat effects on the materials listed below:

Knowledge: Amplification and Guidance

- Ferrous metals such as: carbon steel, cast iron, chrome Molybdenum, stainless steel, Duplex and super duplex, Cunifer
- Non-ferrous metals such as: copper, aluminium, brass, Monel, titanium, Inconel, Hastelloy
- Non-metallic materials such as:
  - Plastics e.g. ABS, HDPE, PE, PP, PVC, PVC-U.
  - Glass Reinforced Plastic (GRP)
  - Glass Reinforced Epoxy (GRE)
  - Glass
  - Cement
- Lined or Clad materials such as:
  - Cement lined
  - Glass lined
  - PTFE lined
  - Rubber lined
  - Fibreglass Reinforced Plastic (FRP) lined

Pipework fittings and components:

- 90/45-degree elbows (Short radius, long radius) such as: threaded, socket welded, butt welded, crimped, soldered, brazed, compression
- Tee Pieces such as: lateral and equal lateral, threaded, socket welded, butt welded, crimped, soldered, brazed, compression
- Integrally reinforced branch connections. Variants such as: equal branched, lateral branched, elbow branched; with connections of: butt welded, socket welded, threaded.
- Stub ends
- Caps, plugs

Knowledge: Amplification and Guidance
• Unions • Cross • Adapters • Couplings • Nipples • Flanges, blind flanges, lap joint flanges. Including types of face such as full faced, raised faced, Ring Type Joint (RTJ); Including connection types such as: weld neck, slip on flanges, socket welded, screwed. • Reducers such as: eccentric and concentric
K8 Pipework preparation, fabrication, installation, maintenance, testing and decommissioning techniques commonly used throughout the Engineering Construction industry • Risks and hazards associated with pipe shaping, assembly and fabrication. • Use of technical drawings such as: isometric drawings, P&ID, general arrangements, first and third angle projections, orthographic projections. • Creating cutting lists such as: identification of fitting types, deduction of appropriate lengths and welds gaps. • Working to tolerances. • Correct installation of pipework systems such as: spring free installation • Safe use of hand and power tools such as: files, spanners, hand saws, grinders, internal grinders, prep machine, pipe clamps, pipe supports, torque wrenches/backing spanners, nut splitters, reciprocating saws. • Bolt tightening sequences. • Gaskets. Including identification of, safe handling, checking for damage, correct installation. • Removal of pipework systems such as: hazards associated with removal of pipework, estimating weights, identifying isolations, safe method

Knowledge: Amplification and Guidance
of breaking flanges. • Pressure test procedures such as the differences between hydrostatic and pneumatic pressure testing. • Pipe chamfer/root face and gaps. • Pipe supports such as: hangers, shoes, U-bolts, spring pots, dynamic restraints, sliders, rollers, guides, anchors. • Pipework expansion such as: bellows, expansion loops, flexible hoses, sliding joints.
K9 Appropriate codes, practices and industry standards and their application to ensure quality requirements are met Have an awareness of company, manufacturer, national and international standards* such as Piping design codes e.g.: • ASME B31 - American Society of Mechanical Engineers (ASME) code for pressure piping • ISO EN 13480 – European metallic industrial piping • ASME Dimensional Standards Flange joint integrity The Manufactures Standardisation Society (MSS) ASTM International – American Society for Testing and Materials Company quality assurance and quality control procedures.

*A checklist of standards is provided in Section 7

Skills

S1 Comply with appropriate health and safety, risk and quality requirements.

S2 Correctly select and safely use tools and equipment for the fabrication, assembly, installation and decommissioning of pipework components and systems.

S3 Plan, organise and undertake the fabrication, assembly, installation, maintenance and decommissioning of pipework components and systems.

S4 Read, interpret and apply engineering drawing information.

S5 Shape pipework components using hand and power tools to cut, drill, shape and finish components to the required tolerance, specification and standard.

S6 Assemble and install pipework using the appropriate methods, techniques and equipment in accordance with the specification including welded, threaded, bolted and clamped jointing solutions.

S7 Ensure the integrity of joints in accordance with specifications, in line with specified quality procedures and to precise tolerances.

S8 Undertake the testing and inspection of the fabricated and/or installed pipework using the appropriate techniques.

S9 Work with others and contribute to effective working relationships within an Engineering Construction environment.

S10 Apply techniques for the temporary or permanent removal of an engineering construction piping related system or component.

S11 Communicate by keeping others informed about work plans or activities which may affect them and seek assistance from others without causing undue disruption to normal work activities.

Skills: Amplification and Guidance
S1 Comply with appropriate health and safety, risk and quality requirements Compliance with Health and Safety activities could Include, taking part in or facilitating toolbox talks, filling in the appropriate safety paperwork, such as: • The participation and following of the sites risk assessments and identification of potential hazards. • Compliance with the different permit to work systems. • Participation and following of method statement documents. • The participation in the site/company inductions and toolbox talks. • The understanding and compliance of technical drawings. • Understanding of the relevant legislation associated with the pipefitting trade. • Understanding site safety systems. • Understanding and following the site/company quality procedures.
S2 Correctly select and safely use tools and equipment for the fabrication, assembly, installation and decommissioning of pipework components and systems This includes: • The safe withdrawal, from stores, of the relevant tools and equipment for the task. • The reading of manuals and safety procedures appertaining to the task. • The use of tools and equipment such as: ➢ The safe and accurate use of bandsaw, threading machines, handheld threading equipment (banjos), hydraulic pipe bending machines, handheld grinder and internal grinder, reciprocating saws, prep machines, various drills such as pedestal drills, pistol drills, hammer drills, magnetic drills. ➢ The safe and proper use hand tools such as hacksaws, various files such as the half round file and round file, hammers, combination

Skills: Amplification and Guidance
spanners, pipe wrenches. ➢ A good understanding of torque wrenches, backing spanners, alignment tools and all other tools and equipment used in the controlled bolting process. ➢ The safe and accurate use of profile burners and other oxy-fuel cutting equipment. • The safe use and a good understanding of basic lifting equipment such as strops, chains, blocks, pull lifts, shackles.
S3 Plan, organise and undertake the fabrication, assembly, installation, maintenance and decommissioning of pipework components and systems • The planning and organising of the task. To include: understanding and complying with the RAMS or and permit to work, completing a personal risk assessment, identifying deficiencies or changes required to the RAMS or permit to work, obtaining of the correct drawings or procedures and of the correct tools and equipment for the task. • The setting up of the work area. To include: a safe setting and environment for the task, making sure correct power supplies are connected. • The material edge preparation. To include: the safe use of hand tools and power tools, the compliance with the drawings or specifications ensuring that tolerances are followed. The correct metal finishes should be obtained using the correct tools and measurements. • Assembly such as: the fabrication of pipe spools from a drawing or specification using a variety of methods and fittings such as welded, threaded or the use of sockets. Bending could also be considered in this process. • Installation. To include: the use of flanged pipework using the correct techniques, the safe use of the mechanical joint integrity procedures, the use of the welding process setting up field welds, installing screwed pipework. Specific skills to look for could include: • Reading and understanding technical drawings and isometrics. • Accuracy of metal preparation. • Use of spanners and torque wrenches.

Skills: Amplification and Guidance
• Tension settings. • Correct gasket selection. • Flange tightening sequences. • Isolation procedures. • Correct disassembling procedures.
S4 Read, interpret and apply engineering drawing information • Isometric Drawings, first angle and third angle projection drawings, 3D and CAD drawings. To be able to demonstrate the following: to accurately measure; to fabricate items within tolerance; identify pipe sizes; identify and select fittings; to measure and identify outside diameters; identify and demonstrate pipe falls; follow coordinates and elevations; to match up hatch lines; identify penetrations; identify flows; understand and check BOM (Bill of Materials); understand the specifications; understand and identify what the Non Destructive Testing (NDE) requirements are; identify and undertake the required pressure testing; identify the Welding Procedure Specification (WPS); identify and ensure the correct bolt hole orientation; understand in line item symbols/in line item orientation; identify off sets and rolling offsets. • Piping and Instrument Diagrams (P&ID). Such as: demonstrating and understanding of symbols, instrumentation, process flows, isolations, branches, reducers. • General Arrangements. (GA). Such as: demonstrating and understanding locations, overall compositions, structures. • Branch Making. Such as: demonstrating development of templates, formulae, equal and unequal branches, square and lateral, selecting the tools and equipment to be able to make branches. • Datum Lines. Such as: demonstrating the ability to comply with tolerances, references, measurements, dimensions, mark out pipe centre lines and segmenting of a pipe.
S5 Shape pipework components using hand and power tools to cut, drill, shape and finish components to the required

Skills: Amplification and Guidance
tolerance, specification and standard • Preparing pipework for welding following the technical instructions and specifications. • Cut pipework using a handsaw, bandsaw and grinders to tolerance and specification. • Preparing threaded pipework using hand-held and machine threading equipment. • Drilling pipework by using different machines such as pistol drill, magnetic drill, pedestal drill to the required specification and tolerances. • Hydraulic and manual bending of pipe and using the correct techniques and bending equipment to tolerance and specification. • Manual bending of tubing using the correct techniques and bending equipment to tolerance and specification. • The safe and accurate use of thermal cutting equipment such as hand-held oxy fuel, plasma cutting equipment and profile burners. • Branch development preparation equal and lateral, drawing and cutting out branch templates, followed by transferring the branch template to pipe and developing the branch using hand tools to tolerance and specification.
S6 Assemble and install pipework using the appropriate methods, techniques and equipment in accordance with the specification • The assembling methods and techniques used in the controlled bolting process such as correct bolting sequences and use of alignment equipment. • The safe and accurate setting up of weld butts, following the specifications for the welder with correct chamfer angles, weld gaps and root faces. • The correct use of 'bullet tacks' for thicker walled pipework. • The assembling of threaded pipework using the correct fittings and joining compounds; ensuring that the pipework is correctly aligned and within the tolerances stated. • The assembling of socket pipework, following the specifications/drawings and ensuring expansion gaps are used; ensuring that the pipework is correctly aligned and within the tolerances stated.

Skills: Amplification and Guidance
• When installing the pipework following the correct specifications and technical drawing information such as elevations, orientations and co-ordinations. • Utilising basic lifting equipment to position and install the pipework to reduce the manual handling required. • The installing of pipe supports such as shoes, U-bolts, spring pots, guides and anchors to the correct specification and technical drawing information.
S7 Ensure the integrity of joints in accordance with specifications, in line with specified quality and to precise tolerances • Knowledge of the legislation associated with joint integrity. • Compliance with the technical drawing (Isometric, P&ID). • Hazards and risk assessments. • Correct checking and cleaning of the jointing surface. • Correct gasket, bolt, washer, bolt lubrication selection as required according to the drawings and specifications. • Bolt lubrication and coefficient. • Correct gasket insertion and placement. • Flange alignment. To include different alignment methods and tools. • Correct tensioning tool selection and pre-setting. • Correct torque values, safe use of torque wrenches. • Controlled bolting. • Correct flange bolt sequencing. • Using the correct backing spanners. • Using the correct tensioning tools.

Skills: Amplification and Guidance
• Checking the completed joint for adherence to tolerances and specifications. • Following the correct company, site, specification and legislative quality requirements.
S8 Undertake the testing and inspection of the fabricated and or installed pipework using the appropriate techniques • Following legislative, company, site pressure test procedures and specifications. • Different types of pressure testing such as strength/proof tests and leak tests. • Awareness of the GS4 HSE pressure testing guidelines. • The safe use of pressure test rigs ensuring they are rated appropriately in date and tagged correctly. • The safe areas of work including designated testing areas, barriers and signs. • Risks and hazards associated with pressure tests. • The safe use of positive displacement pumps and mechanical pumps. • The use of hoses ensuring they are rated appropriately in date and tagged correctly. • The correct use of pressure recorders ensuring the calibration dates are correct and temperature and time are factored in and recorded. • The different types of test medium such as hydrostatic, pneumatic and hydraulic tests. • The use of analogue and digital gauges and their accuracy and eccentricities. • The safe use of pressure relief valves. • A good knowledge of PUWER and how it relates to testing. • Inspection of fabricated and installed pipework by utilising measuring devices, levels, plate squares, theodolites to ensure they meet the required drawings and specifications. • QA and QC company procedures such as fabrication control sheets, erection control sheets, pre-test check sheets, post-test checklist, punch lists and snagging.

Skills: Amplification and Guidance
S9 Work with others and contribute to effective working relationships within an Engineering Construction environment • Good communication with work colleagues and clients. • A good working knowledge of relevant Health and Safety legislation. • Developing effective working relationships with colleagues, clients, management other people on site etc. • Good communication of work plans, promoting positive conversations on how the task may effectively be completed. • Good concise information given on handovers.
S10 Apply techniques for the temporary or permanent removal of an engineering construction piping related system or component • Hazard and risk assessments. • Legislation. • Technical drawings (P&ID, Isometrics). • Isolations. • Safely break a flanged joint that has residual product in it. • Installing slip plates, blind flanges, turning figure 8 spectacle blinds. • Cold cutting of pipework such as handheld reciprocating saws, chain mounted reciprocating saws, clam shell/split frame cutters, manual wheeled/rotary pipe cutters. • Controlled bolting. • Hot bolting.

Skills: Amplification and Guidance
• Torque settings. • Torque and tensioning tools. • Waste disposal management. • Removing spool pieces, individual valves or other in line equipment such as pumps, heat exchangers, filters etc.
S11 Communicate by keeping others informed about work plans or activities which may affect them and seek assistance from others without causing undue disruption to normal work activities • HSE guidelines. • Method statements. • Permit to work. • Signage. • Roles and responsibilities. • Handovers. • Identifying that their work will influence others around them. • Effectively and efficiently communicating with other personnel who may be above, below or adjacent to their work area to inform them of their work plans. • Requesting assistance from colleagues and others without wasting their time.

Behaviours

B1 Work with others to effectively and efficiently complete the allocated tasks.

B2 Solve problems within their area of responsibility by applying technical skills and knowledge to define, identify, evaluate and select alternative solutions if required.

B3 Take responsibility as an individual and team member for the quality of the work.

B4 Support their own learning and development and that of others through activities such as mentoring and sharing of expertise and knowledge.

B5 Act ethically, displaying maturity, honesty, integrity and responsibility.

B6 Work safely in accordance with health, safety and environmental legislation, regulations and company-specific requirements.

B7 Maintain a safe, clean and tidy work area.

B8 Check for and identify potential hazards in the workplace and take collective responsibility to maintain a safe working environment.

B9 Question unsafe behaviours and incorrect work practices and procedures.

Behaviours: Amplification and Guidance

B1 Work with others to effectively and efficiently complete the allocated tasks

- Sharing workload fairly between team members.

B2 Solve problems within their area of responsibility by applying technical skills and knowledge to define, identify, evaluate and select alternative solutions if required

This could include:

Behaviours: Amplification and Guidance
• Potential clashes within the pipework systems • Accessibility for equipment on site • Calculations on site runs
B3 Take responsibility as an individual and team member for the quality of the work • Ensuring work completed meets the required specifications and tolerances.
B4 Support their own learning and development and that of others through activities such as mentoring and sharing of expertise and knowledge
B5 Act ethically, displaying maturity, honesty, integrity and responsibility
B6 Work safely in accordance with health, safety and environmental legislation, regulations and company-specific requirements
B7 Maintain a safe, clean and tidy work area • Work area preparation. To include: risk assessments, cable management, slip/trip hazards, removal of waste, clean environment, general safety, efficiency of operating standards, dusty/dirty floor workspaces, safe access and egress • Work area re-instatement. To include: waste disposal policies, consumables, return of tools to stores, continuously ensuring high standards of housekeeping.
B8 Check for and identify potential hazards in the workplace and take collective responsibility to maintain a safe working environment
B9 Question unsafe behaviours and incorrect work practices and procedures

L3 EPA Engineering Construction Pipefitter

EPA Specification Section 5 – Assessment

- Assessment summary
- Retake and resit information
- Overall grading
    - 5.1 Knowledge test and component grading
    - 5.2 Practical Observation and component grading
    - 5.3 Technical Interview and component grading

Contacts

This specification has been designed to provide all the advice and guidance you need to prepare yourself and your apprentices for endpoint assessment. However, if you have any further questions please contact the EUIAS Help Desk using one of the following:

Help Desk email: enquiries@euias.co.uk
Help Desk telephone: 0121 713 8310

Assessment Summary

The end-point assessment for Engineering Construction Pipefitter (ECP) consists of three components:

Knowledge Assessment

- The test ensures that the apprentice has acquired the underpinning knowledge to enable them to perform their role. The test consists of 50 multiple choice questions to be answered in a 90-minute assessment under controlled conditions. Each question will present the apprentice with 4 options from which they must select the correct one.

Practical Assessment

- This is a skills-based practical exercise which will take a maximum of 8 hours. The exact duration will be similar to the time expected for a competent pipefitter to complete a similar task. The task will be one holistic pipefitting task. During the test the Independent Assessor can question the apprentice to ascertain the depth and breadth of their underpinning knowledge.

Structured Professional Review

- This is a face-to-face professional review which takes place after successful completion of the knowledge and practical tests. The review will evidence the demonstration of behaviours stated in the standard and satisfaction of Eng Tech requirements and can be used to question the apprentice on any areas they may have failed to effectively demonstrate. The review will be expected to last 90 minutes and will consist of a professional discussion and behavioural questions.

Roles and responsibilities

EUIAS will provide assessors.

The employer or training provider will provide the venues for all assessments, including settings for the Practical Assessment which must be suitably equipped to allow the apprentice to attempt all aspects of the Practical Assessment. The employer or training provider will provide all necessary tools and equipment for the apprentice.

The employer or training provider will adequately prepare apprentices for the end-point assessments and will ensure the Practical Assessment evidence for each apprentice is submitted to EUIAS prior to end-point assessment at an agreed date.

Retake and resit information

Elements 1 and 2 below can be delivered in any order, however EUIAS recommend beginning with the knowledge Assessment. Element 3 **must** always be delivered last:

- Element 1: Knowledge Test
- Element 2: Practical Assessment
- Element 3: Structured Professional Review

The apprentice **must** pass each element before they can progress onto the next. If the apprentice fails one element the apprentice must, with immediate effect, be withdrawn from the EPA process. The EUIAS will provide feedback to the employer and or training provider and agree an action plan for the apprentice.

The apprentice will only be expected to retake the ECP EPA element that they have failed. The retake **must only** be carried out after one month has elapsed since the first scheduled date of the EPA element. The apprentice **cannot achieve higher than a pass** for the EPA element that they have had to retake.

Weightings and Overall Grading

Each assessment method is marked separately and awarded either a fail, pass, merit or distinction.

The Knowledge Test grade is based on the percentage score achieved. The grade and mark for both the Practical Assessment and the Structured Professional Review is based on the number and level of criteria achieved.

	Pass	Merit	Distinction	Overall EPA weighting
Knowledge Test	60%	70%	85%	0.35
Practical Assessment	60% All pass criteria achieved	75% A pass plus minimum of 3 merit criteria achieved	85% A merit plus minimum of 2 distinction criteria achieved	0.55
Structured Professional Review	60% All pass criteria achieved	75% A pass plus minimum of 5 merit criteria achieved	85% A merit plus minimum of 2 distinction criteria achieved	0.10

The overall EPA grade is determined by

- Combining the individual assessment percentages to give an overall percentage taking in to account each methods' weighting
- Using the number of passes, merits and distinctions awarded across the assessment methods.

The overall mark for the ECP standard is based on the marks and weightings in individual elements as follows:

Final Percentage =

(assessment method 1 percentage x weighting) +

(assessment method 2 percentage x weighting) +

(assessment method 3 percentage x weighting)

The overall grade for the ECP standard is based on the overall mark and grades achieved in individual elements as follows:

Overall EPA percentage	>=85%	>=70%	>=60%	>=0%
	AND	AND	AND	AND
Number of passes, merits and distinctions	minimum of 2 merits and 1 distinction	minimum of 2 merits	minimum of 3 passes	at least 1 fail
	=	=	=	=
Final grade awarded	**Distinction**	**Merit**	**Pass**	**Fail**

Example 1

Apprentice A achieved

Knowledge Test: 72% (Merit)

Practical Assessment: 70% (Pass)

Structured Professional Review: 90% (Distinction)

The overall percentage is calculated as

(72 x 0.35) + (70 x 0.55) + (90 x 0.10) = 72.7%

The apprentice would achieve a **merit** because

- Their overall percentage is greater than 70%
- They have achieved a minimum of 2 merits (merit, pass, distinction).

Example 2

Apprentice B achieved

Knowledge Test: 96% (Distinction)

Practical Assessment: 70% (Pass)

Structured Professional Review: 70% (Pass)

The overall percentage is calculated as

(96 x 0.35) + (70 x 0.55) + (70 x 0.10) = 79.1%

The apprentice would achieve a **pass** because

- Their overall percentage is greater than 70% but they have **not** achieved a minimum of 2 merits, so they cannot achieve a merit
- Their overall percentage is greater than 60% and they have achieved minimum pass for all 3 elements, so they can achieve a pass.

L3 EPA Engineering Construction Pipefitter

EPA Specification Section 5.1 – The Knowledge Assessment

- Criteria
- Grading

Contacts

This specification has been designed to provide all the advice and guidance you need to prepare yourself and your apprentices for endpoint assessment. However, if you have any further questions please contact the EUIAS Help Desk using one of the following:

Help Desk email: enquiries@euias.co.uk
Help Desk telephone: 0121 713 8310

Introduction

The Knowledge Test consists of 50 multiple choice questions sampling the knowledge, skills and behaviours (listed below as K1, K2, K3, K4, K5, K6, K7, K8, K9, S4 and B7) of the ECP standard. The practice test supplied as part of this document illustrates the formal and style of the assessment.

Preparing for the Knowledge Test

- While on-programme, the employer or training provider should ensure the apprentice is familiar with all areas assessed by the Knowledge Test
- The employer or training provider should support the apprentice to complete a practice test and provide them with formative feedback to enable them identify areas of further learning

Knowledge Test Criteria

The criteria that are covered in the Knowledge Test (KT) are listed below. In each assessment, questions will cover each of the areas; not every aspect of every area will be covered in every assessment. Refer to Section 4 for amplification and guidance.

KSB	Number of KT questions
K1 Relevant health, safety and environmental legislation, regulations and company-specific requirements for safe working practices and procedures **B7** Maintain a safe, clean and tidy work area	4-6
K2 Importance and benefits of recognised Industry safety passport schemes	1-2
K3 How to work safely, personal site safety responsibilities and how to respond to and provide solutions to problems and emergencies	3-5
K4 Engineering practices and principles including reading engineering drawings and marking out techniques **S4** Read, interpret and apply engineering drawing information	5-7
K5 Mathematical techniques and formula related to the fabrication, development and installation of pipework systems	7-9
K6 How to correctly select and safely use hand tools, mechanical tools and equipment in differing environments for the fabrication, repair, installation and decommissioning of pipework systems	7-9
K7 Common and specialist pipe materials such as ferrous, non-ferrous and non-metallic including fittings associated with the pipework components and systems	7-9
K8 Pipework preparation, fabrication, installation, maintenance, testing and decommissioning techniques commonly used throughout the Engineering Construction industry	7-9
K9 Appropriate codes, practices and industry standards and their application to ensure quality requirements are met	1-3

Knowledge Test Grading

This component is graded as follows:

Grade	Mark
Fail	< 30 marks
Pass	30 – 34 marks
Merit	35 – 42 marks
Distinction	43 - 50 marks

L3 EPA Engineering Construction Pipefitter

EPA Specification Section 5.2 – The Practical Observation

- Introduction
- Preparing for the Practical Observation
- Practical Observation Grading
- Grading Criteria

Contacts

This specification has been designed to provide all the advice and guidance you need to prepare yourself and your apprentices for endpoint assessment. However, if you have any further questions please contact the EUIAS Help Desk using one of the following:

Help Desk email: enquiries@euias.co.uk
Help Desk telephone: 0121 713 8310

Introduction

The Practical Assessment consists of one holistic pipefitting task. The apprentice will be expected to work to the tolerances and specifications as stipulated in an engineering drawing to fabricate, assemble, install, test and then dismantle a piping assembly.

The content of the Practical Assessment will relate to 3 specifications of comparable depth and breadth of which one will be used for the test. During the Practical Assessment, apprentices will be asked questions by the assessor to determine the complexity and extent of the apprentices underpinning knowledge. This is a skill based practical exercise which will test:

- Knowledge (K4, K5, K6, K7, K8, K9)
- Skills (S1, S2, S3, S4, S5, S6, S7, S8, S10)
- Behaviours (B1, B2, B3, B4, B5, B6, B7, B8, B9)

See Section 4 for the references to the standard.

EUIAS will provide the Practical Assessment brief that the apprentice will be working with. EUIAS will also provide the rig that the pipe assembly will need to be secured to. Refer to section 6 for guidance on how to set up a Practical Assessment.

The duration of the Practical Assessment is a maximum of 8 hours, and the actual time allowed will be based on the comparable time that an industry competent worker would take to achieve successful completion of the set task(s). The Practical Assessment will be delivered and assessed by the EUIAS Independent Assessor under strict controlled conditions.

The apprentices should be made aware and should confirm their understanding of the requirements of the grading criteria in order to achieve their full potential in achieving a pass, merit and distinction. If the apprentice does not achieve a ‘pass’ the apprentice will need to retake this EPA element, further information can be found in Section 5 ‘Retake and Resit Information’.

The EUIAS Service Delivery team will work with the employer or training provider to schedule the Practical Assessment.

Grading the Practical Assessment

The Practical Assessment is marked out of 100. The grading criteria are described in the following pages.

All pass criteria must be achieved in order to achieve a pass.

The merit and distinction grade for the Practical Assessment are determined by the level and number of criteria achieved

Practical Assessment Grading

The Practical Assessment is graded by the Independent Assessor appointed by EUIAS. The following tables explain the criteria that are applied in order to achieve each grade for the Practical Assessment.

To achieve a **PASS** for the Practical Assessment, a Pass is required in **ALL** relevant criteria:

KSB	K4	K5	K6	K7	K8	K9	S1	S2	S3	S4	S5	S6	S7	S8	S10	B2	B3	B6	B7	B8
All Pass criteria must be achieved	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Achieving all these elements represents a total score of 60 in the Practical Assessment.

A higher score is achieved by achieving Merit and Distinction criteria as described below. Each of the Merit and Distinction criteria gains the apprentice a further 5 marks towards their total percentage score for the Practical Assessment.

To achieve a **Merit** for the Practical Assessment, all Pass criteria must be achieved PLUS a **minimum of three** Merit criteria.

To achieve a **Distinction** for the Practical Assessment, the apprentice must achieve a Merit PLUS a **minimum of two** Distinction criteria.

Practical Assessment Grade	Minimum Criteria Achieved	Minimum marks achieved
Pass	All Pass criteria	60 marks
Merit	Pass PLUS a minimum of 3 Merit criteria	75 marks (60 plus 3 x 5)
Distinction	Merit Plus a minimum of 2 Distinction criteria	85 marks (75 plus 2 x 5)

Note. It is possible to score more than 75 and NOT achieve a Merit because a minimum of three Merit criteria have not been achieved. Similarly, it is possible to score more than 85 and not achieve a Distinction because a minimum of three Merit and two Distinction criteria have not been achieved.

The Practical Assessment carries a weighting of 55% when calculating the final grade.

Indicative ‘pass’ criteria for the Practical Assessment

The following criteria are indicative of the criteria the assessor will be looking for when the apprentice carries out the Practical Assessment.

Standard	Indicative Pass Criteria
K4 Engineering **practice and principles** including reading engineering drawings and markings out techniques	Follow requirements given in: • isometric drawings • Piping and Instrument Diagrams (P&ID) • General Arrangements • branch making • datum lines
K5 Mathematical techniques and formula related to the fabrication, development and installation of pipework systems	Use appropriate techniques and formula such as: • surface areas, circumferences, section areas, pipe diameter, pipe weights • branch pattern development such as template drawings, development formulae, datum lines, mitres. • offsets, rolled offsets to include: run, travel, roll, angles • torque values for controlled bolting to include: torque settings, bolts, gaskets, flanges, lubricants, co-efficient, k factor. • knowledge of calculations for safe distances in pressure testing, pressure, fittings.
K6 How to correctly **select and safely use hand tools**, mechanical tools and equipment in differing environments for the fabrication, repair, installation and decommissioning of pipework systems	Select and safely use: • marking out tools • surfaces such as benches, floor, template paper

Standard	Indicative Pass Criteria
	• hand tools • mechanical tools and equipment • lifting equipment • mechanical joint integrity tools • pressure testing equipment
K7 Common and specialist pipe material such as ferrous, non-ferrous and non-metallic including fillings associated with the pipework components and systems	Work with relevant materials such as: • ferrous (e.g.carbon steel, stainless steel , Cunifer, duplex/super duplex, chrome Molybdenum) • non-ferrous (e.g.copper) • non-metallic (e.g.plastic) • pipework fitting and components (e.g. 90/45 degree elbows, tee pieces, sockets, welded fittings, threaded fittings, flanges)
K8 Pipework preparation, fabrication, installation, maintenance, testing and decommissioning techniques commonly used throughout the Engineering Construction industry	Demonstrate • use of technical drawings • creating cutting lists • working to tolerances • correct installation • safe use of hand and power tools • bolt tightening sequences • correct gaskets • removal of pipework system • pressure test procedures

Standard	Indicative Pass Criteria
	• use of pipe chamfer/root face and gaps • use of pipe supports and expansion • pressure test procedures • working safely, knowing risks and hazards
K9 Appropriate codes, practices and industry standards and their application to ensure quality requirements are met	Refer to and work in accordance with company, manufacturer, national and international standards, to include • ASME and ANSI Standards • quality assurance and quality control procedures.
S1 Comply with appropriate **health and safety, risk and quality** requirements **B6** Work safely in accordance with health, safety and environmental legislation, regulations and company-specific requirements **B7** Maintain a safe, clean and tidy work area **B8** Check for and identify potential hazards in the workplace and take collective responsibility to maintain a safe working environment	• Demonstrate a clear knowledge of on-site legislation • Carry out risk assessments to identify on site hazards • Identify and wear the correct PPE for the task • Demonstrate a clear understanding of their own HS&E responsibilities and that of others • Comply with the required HS&E working practices and regulations • Liaise with other relevant parties to inform them of any risks during the task • Re-assess conditions on a regular basis and update the risk assessment when required • Inspect tools and equipment before use • Safely re-instate the work area leaving it safe and ready for others to use
S2 Correctly **select and safely use tools and equipment** for the	• Demonstrate clear knowledge of the tools and equipment selected

Standard	Indicative Pass Criteria
fabrication, assembly, installation and decommissioning of pipework components and systems	for the task • Demonstrate a clear understanding of the legislation and the HSE guidelines associated with the tools or equipment selected for the task • Demonstrate a clear knowledge of the capabilities of the tools selected for fabrication and assembly of pipework • Demonstrate a clear knowledge of the tools and equipment required for installing pipework • Demonstrate a clear knowledge of the tools and equipment required for the disassembly of pipework • Demonstrate a clear understanding of the maintenance of the tools required for the task • Identify potential hazards when selecting tools for the disassembly of pipework
S3 Plan, organise and undertake the fabrication, assembly, installation, maintenance and decommissioning of pipework components and systems	• Follow any legislation or HSE guidelines before undertaking any task • Ensure that the work area is safe and suitable for the task • Select the correct tools for the task and make sure they are safely connected • Interpret relevant technical drawings and comply with any tolerances • Prepare the materials and equipment ready for assembly • Ensure that any materials and consumables required are suitable for the task • Assemble components and fittings accurately and in compliance with

Standard	Indicative Pass Criteria
	drawings or specifications • Install pipework using the correct fastenings in compliance with drawings and specifications • Safely re-instate the area
S4 Read, interpret and apply **engineering drawing** information	• Read and correctly interpret a range of technical information provided to plan and conduct the work • Demonstrate a clear understanding of the purpose and use of the technical information provided for the work • Use, refer to the technical information provided to check, confirm the work conducted meets the required company standards and specifications • Where necessary, question and clarify any information which is not clearly understood • Carry out checks to show that the task complies with the technical drawing and meets the required specifications
S5 Shape pipework components using hand and **power tools** to cut, drill, shape and **finish components** to the required tolerance, specification and standard	• Follow Health and Safety guidelines before the task • Complete a risk assessment and identify potential hazards before the task • Ensure that the work area is suitable for the task to be undertaken. • Select the correct tools for the task and make sure they are safely connected • Select the correct tools for the material • Interpret any drawings or specifications associated with the task.

Standard	Indicative Pass Criteria
	• Ensure that the shaping, holes or cuts comply with the specification • Use the appropriate techniques for the shaping, drilling or cutting • Ensure that the cut, hole or shaping is within the tolerance stated on the specification
S6 Assemble and install pipework using the appropriate **methods, techniques and equipment** in accordance with the specification including **welded, threaded, bolted and clamped jointing solutions** **B2** Solve problems within their area of responsibility by applying technical skills and knowledge to define, identify, evaluate and select alternative solutions if required	• Identify any potential hazards associated with the task and carry out a risk assessment • Follow all the appropriate legislation regarding the task • Prepare the work area before the task and ensure that is suitable for the task to go ahead • Select the correct tools for the task and make sure they are safe and fit for purpose • Interpret drawings and specifications for the job and follow the tolerances identified • Accurately mark out pipework in compliance with any specifications • Assemble components in compliance with the drawing and follow the tolerances using appropriate techniques • Install pipework safely, using the correct mechanical joint equipment or by setting up welding pipework using the correct techniques • Check that the completed assembly or installation of pipework complies with the Drawing or specification • Safely re-instate the work area

Standard	Indicative Pass Criteria
S7 Ensure the **integrity of joints** in accordance with specifications, in line with specified **quality procedures** and to **precise tolerances** **B3** Take responsibility as an individual and team member for the quality of the work	• Follow Health and Safety guidelines before the task • Complete a risk assessment and identify potential hazards before the task • Ensure that the work area is suitable for the task to be undertaken. • Interpret any drawings associated with the task • Select the correct tools for the task and make sure they are safely connected • Select the correct gaskets and bolts for the joint • Identify the correct torque value of the joint • Ensure that the joint is aligned according to the specification
S8 Undertake the **testing and inspection** of the fabricated and or installed pipework using the **appropriate techniques**	• Ensure that the test area is suitable to carry out the test • Ensure that the documentation such as test procedures are followed • Select that the correct test medium is used • Suitable barriers must be put up and other people near the test area are informed of the task • Ensure that the test rig is suitable and that all joints are securely made up • Ensure that the gauges are fit for purpose and are free from any dirt • Ensure the temperature and weather is suitable for the test

Standard	Indicative Pass Criteria
S10 Apply **techniques for the temporary or permanent removal** of an engineering construction piping related system or component	• Identify any potential hazards that may arise when removing any pipe related systems • Identify isolation points • Interpret technical drawings such as P&IDs to identify where the removal will take place • Ensure isolations are in place before removal of any pipe related system or component • Ensure that the removal of the piping related system or component can be done safely

Indicative grading criteria for Merit and Distinction for the Practical Assessment

Each criterion is worth 5 marks to the overall score for the Practical Assessment.

Indicative Merit criteria (each worth 5 marks)	Indicative Distinction criteria (each worth 5 marks)	Relevant elements of the standard where the criteria may be demonstrated
M1 Occasionally exceeds the health and safety requirements and endeavours to identify and suggest improvements	**D1** Goes above and beyond health and safety requirements and consistently identifies and suggests improvements	K6, K9, S1, S2, B6, B8
M2 Occasionally exceeds standards in their pipefitting skills, knowledge and behaviours, and is able to identify issues and resolve them as and when they occur	**D2** Consistently exceeds the required standard in their pipefitting skills, knowledge and behaviours, and identifies issues and resolves them before they occur	K6, K8, S5, S6, S7, S8, S10, B2
M3 Consistently meets and occasionally exceeds the required levels of accuracy when working against engineering specifications and may offer suggestions for continuous improvement when prompted	**D3** Consistently exceeds the specified levels of accuracy when working against engineering specifications and consistently seeks to continuously improve methods and means of executing given pipefitting tasks	K4, K5, S4, B2
M4 Displays a comprehensive command across the full range of knowledge requirements and when prompted, applies this to problem-solve and improve the quality of their own work	**D4** Full command of first principles which are autonomously applied in order to solve and improve quality of own work and overall process	K4, K5, S5, S6, S7, S8, S10, B2

L3 EPA Engineering Construction Pipefitter

EPA Specification Section 5.3 – The Technical Interview

- Preparing the evidence portfolio
- Preparing for the Technical Interview
- Criteria and Grading

Contacts

This specification has been designed to provide all the advice and guidance you need to prepare yourself and your apprentices for endpoint assessment. However, if you have any further questions please contact the EUIAS Help Desk using one of the following:

Help Desk email: enquiries@euias.co.uk
Help Desk telephone: 0121 713 8310

Introduction

The Structed Professional Review is the final stage of the end-point assessment. It is assessed via a discussion with a review panel which will consist of at least two Independent Assessors. Representatives from the apprentice's employer or training provider are **not allowed** to be present in the room whilst the review is being conducted.

The discussion will focus on each of the elements of the standard listed below. It is important that the apprentice is completely familiar with each of them.

- Knowledge (K1, K2, K3)
- All Skills (S1, S2, S3, S4, S5, S6, S7, S8, S9, S10, S11)
- All Behaviours (B1, B2, B3, B4, B5, B6, B7, B8, B9)

See Section 4 for the references to the standard.

In advance of the review the apprentice will receive information about how the review will work and a template for the Evidence Report to be completed in advance of the review. The apprentice should use the Evidence Report template to detail examples of evidence of application of skills, knowledge and behaviours typically drawn from at least 3 examples of completed pipefitting tasks.

The apprentice must be given **2 months** to complete the Evidence Report, and the completed report must be submitted to EUIAS a **minimum of 10 working days** before the review.

The review will last approximately 90 minutes.

The Structured Professional Review will:

- take place after successful completion of the Knowledge Test and Practical Assessment
- be face to face (remote interviews may be applicable pending on Covid-19)
- be recorded on a review record
- be fully audio recorded for the purpose of audit and quality assurance
- evidence the above KSBs
- allow the apprentice to evidence where they have satisfied the requirements against the 5 UKSPEC areas of competence to register as Eng Tech

The apprentice can achieve a pass, merit or distinction. If the apprentice fails, this element the apprentice must with immediate effect be withdrawn from the EPA process. Further information can be found in Section 5 'Retake and Resit Information'.

Grading the Structured Practical Review

The Structured Practical Review is marked out of 100. The grading criteria are described in the following pages.

All pass criteria must be achieved in order to achieve a pass.

The merit and distinction grade for the Structured Practical Review are determined by the level and number of criteria achieved

Structured Professional Review Grading

The Structured Professional Review is graded by the Independent Assessors appointed by EUIAS. The following tables explain the criteria that are applied in order to achieve each grade for the Structured Professional Review.

To achieve a **PASS** for the Structured Professional Review, a Pass is required in **ALL** relevant criteria:

KSB	K1	K2	K3	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	B1	B2	B3	B4	B5	B6	B7	B8	B9
All Pass criteria must be achieved	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Achieving all these elements represents a total percentage score of 60 marks in the Structured Professional Review.

A higher score is achieved by attaining Merit and Distinction criteria as described below. Each of the Merit criteria gains the apprentice a further 3 marks and each Distinction criteria gains the apprentice a further 2 marks towards their total score for the Structured Professional Review.

To achieve a **Merit** for the Structured Professional Review, all Pass criteria must be achieved PLUS a **minimum of five** of the Merit criteria.

To achieve a **Distinction** for the Structured Professional Review**,** the apprentice must achieve a Merit PLUS a **minimum of five** of the Distinction criteria.

Structured Professional Review Grade	Minimum Criteria Achieved	Minimum marks achieved
Pass	All Pass criteria	60 marks
Merit	Pass PLUS a minimum of 5 Merit criteria	75 marks
Distinction	Merit Plus a minimum of 5 Distinction criteria	85 marks

Note. It is possible to score more than 75 marks and NOT achieve a Merit because a minimum of five Merit criteria have not been achieved. Similarly, it is possible to score more than 85 marks and not achieve a Distinction because a minimum of five Merit and five Distinction criteria have not been achieved.

The Structured Professional Review carries a weighting of 10% when calculating the final grade.

Indicative ‘pass’ criteria for the Structured Professional Review

The following criteria are indicative of the criteria the assessor will be looking for when the apprentice takes part in the Structured Professional Review.

Standard	Indicative Pass Criteria
K1 Relevant health, safety and environmental legislation, regulations and company-specific requirements for safe working practises and procedures	• A working knowledge of Health and Safety legislation associated with the tasks to be undertaken and its impact on day to day operations • A working knowledge of on-site safety procedures which apply to the scope of work to be undertaken • A clear understanding of risk assessments permits and other safety documentation • A clear understanding of company specific policy procedures and can explain them • A good working knowledge of specific site evacuation procedures and safe site-specific practices
K2 Importance and benefits of recognised industry safety passport schemes	Knowledge of industry safety passport schemes, such as • CCNSG (Client Contractor National Safety Group). • CSCS (Construction Skills Certificate Scheme). • ACE Card. (Assuring Competence in Engineering). • EMSS Card (Essential Minimum Safety Standards). Understand the benefits • Ability to work safely on different sites. • Ensure competence of workers. • Accessibility to sites.

Standard	Indicative Pass Criteria
K3 How to work safely, personal site safety responsibilities and how to respond to and provide solutions to problems and emergencies	• Can explain the common types of hazards associated with the relevant pipefitting tools and equipment • Can explain what the employers and the employee's responsibilities are and how this may have an impact on the scope of work to be undertaken • Can explain the consequences of not following the site safety responsibilities and not reporting incidents • Can explain the effects of any potential hazards on people property and the environment and the effects of not wearing the correct PPE • A clear understanding of the purpose of undertaking Risk Assessments
S1 Comply with appropriate health and safety, risk and quality requirements **B6** Work safely in accordance with health, safety and environmental legislation, regulations and company-specific requirements **B7** Maintain a safe, clean and tidy work area **B8** Check for and identify potential hazards in the workplace and take collective responsibility to maintain a safe working environment **B9** Question unsafe behaviours and incorrect work practises and procedures	• A working knowledge of Health and Safety legislation associated with the tasks to be undertaken and its impact on day to day operations. • A working knowledge of on-site safety procedures which apply to the scope of work to be undertaken. • A clear understanding of risk assessments permits and other safety documentation. • Can explain and has a clear understanding of company specific policy procedures. • Has a good understanding of QA and QC systems
S2 Correctly select and safely use tools and equipment for the fabrication, assembly, installation and decommissioning of pipework	• A good working knowledge of the health and safety legislation regarding the use of tools and equipment

Standard	Indicative Pass Criteria
components and systems	• Can describe the potential hazards of using the tools and equipment associated with pipe fitting • A good understanding of the tools, equipment and techniques and how they are used to carry out operations • Can explain the importance of maintaining of all tools and equipment
S3 Plan, organise and undertake the fabrication, assembly, installation, maintenance and decommissioning of pipework components and systems	• Can explain the requirement of Health and Safety legislation in the planning of tasks • Can explain method statements or job plans that take place before any operational task • A good working knowledge of site specifications and procedures • Can explain the safe process of uninstalling pipework components and systems
S4 Read, interpret and apply engineering drawing information	• Can explain the content and use of the different types of engineering drawings and how they are applied during work activities • Can identify tolerances on pipe drawings and can comply with them • A good knowledge of welding specifications and can apply them to the preparation of pipework • Can identify pipework components from technical drawings. • Can interpret different specifications, procedures and guidance notes and can apply them to daily work activities
S5 Shape pipework components using hand and power tools to cut, drill, shape and finish components to the required tolerance, specification and standard	• Can explain the requirements of Health and Safety legislation and can describe the hazards associated with the shaping process • Can describe the relevant specifications and technical drawings

Standard	Indicative Pass Criteria
	including tolerances and weld specifications and how they apply to the shaping process • Can identify the correct tools and equipment for the shaping process and can explain how they are used • Can explain how to check how the required shaping has complied with the technical drawing • Can describe how to shape different components in preparation for the joining process
S6 Assemble and install pipework using the appropriate methods, techniques and equipment in accordance with the specification including welded, threaded, bolted and clamped jointing solutions **B2** Solve problems within their area of responsibility by applying technical skills and knowledge to define, identify, evaluate and select alternative solutions if required	• Can explain the requirements of Health and Safety legislation and can describe the hazards associated with the assembling and installation process. • Can describe the relevant specifications and technical drawings including tolerances and weld specifications and how they apply to the assembling and installation process. • Can describe the correct tools and equipment that may be used in the assembling and installation process. • Can describe the different methods of pipe fabrication and installation and the different types of joining processes. • Can describe how to check if the assembly and installation methods have complied with the relevant specification or technical drawing
S7 Ensure the integrity of joints in accordance with specifications, in line with specified quality procedures and to precise tolerances **B3** Take responsibility as an individual and team member for the quality	• Can explain the requirements of Health and Safety legislation and can describe the hazards associated with the joint integrity process • Can describe the relevant specifications and technical drawings including tolerances and weld specifications and how they apply to

Standard	Indicative Pass Criteria
of the work	the joint integrity process • Can identify the correct tools and equipment for the joint integrity process and can explain how they are used
S8 Undertake the testing and inspection of the fabricated and or installed pipework using the appropriate techniques	• Can explain the requirements of Health and Safety legislation and can describe the hazards when undertaking testing • Can describe the relevant procedures, specifications and technical drawings used when undertaking testing • Can identify the correct tools and equipment for the testing and inspection process and can explain how they are used
S9 Work with others and contribute to effective working relationships within an Engineering Construction environment	• Describe the importance of developing good, effective and productive relationships with different people in the work environment • Can explain the appropriate type of communication such as verbal or written and how we can get clear information to others • Can describe the responsibilities you have to yourself and others within the engineering construction environment
S10 Apply techniques for the temporary or permanent removal of an engineering construction piping related system or component	• Can explain the requirements of Health and Safety legislation and can describe the hazards associated with the removal of an engineering construction piping related system or component • Can describe the relevant procedures, specifications and technical drawings and how they apply to the temporary or permanent removal of an engineering construction piping related system or component • Can identify the correct tools and equipment for the removal process and can explain how they are used. • Can describe the safe methods of on-site waste disposal

Standard	Indicative Pass Criteria
	• Can explain the importance of pipe supports in the process of the temporary or permanent removal of an engineering construction piping related system or component
S11 Communicate by keeping others informed about work plans or activities which may affect them and seek assistance from others without causing undue disruption to normal work activities	• Can explain how to approach colleagues in an appropriate way so is conducive to good working practices • Can explain the importance of a good clear concise handover • Can describe the different types of communication problems that may affect working relationships
B1 Work with others to effectively and efficiently complete the allocated tasks	
B4 Support their own learning and development and that of others through activities such as mentoring and sharing of expertise and knowledge	
B5 Act ethically, displaying maturity, honesty, integrity and responsibility	

Indicative grading criteria for Merit and Distinction for the Structured Professional Review

Each Merit criterion is worth 3 marks and each Distinction criterion is worth 2 marks towards the overall score for the Structured Professional Review.

Indicative Merit criteria (each worth 3 marks)	Indicative Distinction criteria (each worth 2 marks)	Relevant elements of the standard where the criteria may be demonstrated
M1 Can explain instances where they have raised concerns and can describe their subsequent actions	**D1** Able to show instances where they have been able to proffer or implement improvements to workplace safety and explain why these improvements have been successful	K1 K3 S1 B3 B5 B6 B8 B9
M2 Can explain the engineering first principles and techniques. Can explain the roles and responsibilities of allied trades and explains where the work of these trades will impact upon their tasks	**D2** Can explain in detail the technical specialisms of allied trades and explain where the work of these trades will impact upon their tasks and what steps need to be taken to ensure de-confliction	K1 K2 S1 S2 S3 S4 S5 S6 S8 S9 S10 S11 B1 B3
M3 Able to articulate where their work contributes to the overall commercial aims and objectives of the customer	**D3** Recognises the overall impact of them not working to the standard	K3 S1 S3 S6 S8 S9 S10 S11 B1 B2 B3 B6
M4 Can describe a range of common fault diagnosis techniques and recognises where these are best applied **M5** Can justify why the specific techniques was selected to identify and rectify faults	**D4** Contrasts the strengths and weaknesses of common fault diagnosis techniques **D5** Explains their actions and describes what other options may have been available and why these were not deemed suitable or pursued.	K1 K3 S1 S2 S3 S5 S6 S7 S8 B2 B6
M6 Provides evidence of instances where they may have been exposed to unsafe/undesirable behaviours	**D6** Recognises the impact of nonconformance on workplace behaviours and organisational culture.	K1 K3 S1 S2 B1 B3 B5 B6

Indicative Merit criteria (each worth 3 marks)	Indicative Distinction criteria (each worth 2 marks)	Relevant elements of the standard where the criteria may be demonstrated
and how they dealt with these occurrences		B8 B9
M7 Can explain in detail why engineering specifications are required and how they are applied to work-based activities	**D7** Able evidence where they have offered suggestions regarding how the specified engineering specifications could have been modified to improve the work process and quality of the end product	S2 S4 S6 S7 S8 S11 B3 B9
M8 Can explain in detail and can demonstrate where they have acted as an effective team member	**D8** Can explain how they can personally contribute to the productivity and dynamics of the team.	K1 K3 S1 S3 S9 S11 B1 B3 B4 B7 B8 B9

L3 EPA Engineering Construction Pipefitter

A Specification Section 6 – Practice Assessments and guidance

- Knowledge Assessment
- Guidance
- Practice Test (in the Annex)
- Practical Observation
- Guidance for setting up a practice Observation
- Technical Interview

Contacts

This specification has been designed to provide all the advice and guidance you need to prepare yourself and your apprentices for endpoint assessment. However, if you have any further questions please contact the EUIAS Help Desk using one of the following:

Help Desk email: enquiries@euias.co.uk
Help Desk telephone: 0121 713 8310

The Knowledge Test

Guidance – preparation for the Knowledge Test

While on-programme, the employer and or training provider should brief the apprentice on the areas to be assessed by the Knowledge Test, as detailed in Section 5.1. These are the selected knowledge elements of the standard: K1, K2, K3, K4, K5, K6, K7, K8, K9, S4 and B7. It is good practice to identify the areas within the learning programme where the relevant knowledge is delivered and ensuring that apprentices are aware that elements from each of these criteria might come up in the test.

The Knowledge Test is aligned to the standard rather than a specific job role that the apprentice may be doing. The questions have been written to reflect the Engineering Construction pipefitter role as a whole and are not focussed on specific plant, machinery, or employer-specific processes.

In readiness for end-point assessment, the apprentice should complete a sample test, which is included as an Annex to this specification. This should be undertaken in advance of the Knowledge Test, with enough time to mark the assessment, and provide feedback to learners.

For maximum effect, ensure the test is taken in exam conditions similar to those that will be experienced in a live test.

Practical Assessment

Guidance for setting up a Practical Assessment

The Practical Assessment focuses on one holistic pipefitting task. Briefs of comparable complexity have been developed by EUIAS. One of the briefs will be issued by EUIAS for the apprentice. The apprentice will secure the resulting pipe assembly to a rig. The rig will be provided by EUIAS.

While it is not permitted to brief the apprentice on the actual specification that will be selected for the test during the live Practical Assessment, it is permitted to set up specifications of similar complexity and duration and ask the apprentice to carry them out under live assessment conditions. To make the practice more realistic, a tutor or supervisor should adopt the role of assessor and use the appropriate grading criteria from Section 5 to 'assess' the apprentice. A sample brief for the practical assessment is included in Section 7. Also included is a document to record the results of the testing.

Each of the briefs, developed by EUIAS, focus on the tolerances and specifications as stated in an engineering drawing. The practice task brief should provide specification instructions for the apprentice to be able to:

- plan the job
- select the appropriate tools and materials
- focus on the skill
- work safely.

For example, the apprentice will be expected and must work to the tolerance and specifications as stated in an engineering drawing to fabricate, assessable, install, test and then dismantle a piping assembly consistent with a realistic working task. Note that the expectation is the task takes a

maximum of 8 hours and, therefore, must be sufficiently complex to match this duration.

The live Practical Assessment also includes questioning from the Independent Assessor. The questioning is designed to confirm the apprentice's understanding of the rationale for actions taken and choices made to complete the task. To prepare the apprentice for this aspect of the practice Practical Assessment, we recommend developing some open-ended questions which focus on the rationale for each part of the task.

The tutor or supervisor carrying out the practice assessment should record their assessment of how the apprentice performed and provide feedback to the assessor with guidance on what to do to improve their performance, taking note of the grading descriptors for pass, merit and distinction in Section 5.

Structured Professional Review

Preparing for the Structured Professional Review

The purpose of the Structured Professional Review is to allow the apprentice to demonstrate how they have met UK Spec requirements for Eng Tech and combined their skills, technical knowledge and behaviours in order to carry out their occupational role effectively and safely. The discussion will take place between the apprentice and the Independent Assessors. The review is an effective way of assessing complex topics and will allow the apprentice to showcase the depth and breadth of their understanding.

It is a good time to schedule a practice Structured Professional Review. It must be done before the live end-point assessment and with enough time to provide feedback for the apprentice to learn from. A period of two weeks or more is recommended, depending on the circumstances. The key is that the apprentice has time to act on the feedback they get at the end of the practice session.

A period of 90 minutes should be set aside for each practice Structured Professional Review, and a set of open-ended questions prepared to cover each of the areas of the standard covered by the review.

A tutor or supervisor should play the part of the assessor carrying out the review, asking the questions in a 'live test environment'. They should record their assessment of the apprentice's performance, using the grading descriptions in Section 5 as a guide, and provide the apprentice with feedback, focussing on areas of improvement.

The Structured Professional Review questioning should synoptically examine the knowledge, skills and behaviours by the apprentice through their on-programme experience. The questioning should be contextualised to the apprentice's specific job role. The tutor or supervisor must:

- prepare some interview questions around the work that the apprentice has been doing. This should be based as much as possible on evidence that has been collated for the Evidence Report.
- use various questioning techniques to confirm the depth of knowledge and or range of skills
- record the Structured Professional Review or provide a clear narrative if the interview was not recorded. The narrative must describe the apprentices' responses to the questions. The narrative must capture the depth and breadth of the apprentice's response
- ensure the apprentice has provided evidence in their responses to cover all the relevant

elements of the standard

- provide feedback to the apprentice focussing on any areas of the standard missed, or where appropriate, to give guidance on achieving the pass, merit or distinction grades.

The apprentice should be prepared to:

- complete the Evidence Report template over a 2-month period. See Section 7 for the Evidence Report template.
- submit their Evidence Report to EUIAS at least 10 days before the Structured Professional Review
- identify and expand on examples of the application of KSBs in completed pipefitting tasks in the workplace considering the ECP standard.
- demonstrate how they have met the UK Spec requirements for Eng Tech and combined their skills, technical knowledge and behaviours to carry out the occupational role effectively and safely.
- discuss evidence of their work as recorded in the Evidence Report. The report should have examples of job-related tasks so the panel can determine the role the apprentice had taken on to complete the work and understand if and how they overcame any challenges or barriers that were faced to complete the job.
- attend the Structured Professional Review which will be expected to last 90 minutes.
- provide background information about their current job role, workplace, responsibilities and discuss their apprenticeship journey with the panel.
- discuss their first selected example of evidence in the following way where the panel will be using questions to guide and discuss a typical pipefitting activity:
- Understanding and accepting the task
- Reading and extracting information from engineering drawings and designs
- Recognising and adhering to safety considerations
- Preparing the tools, equipment and work area
- Performing the task and working to specifications
- Working with others or as part of a team
- Completing the task
- Reporting the task
- Recovering tools, area and equipment.
- participate in the professional discussion and answer behavioural questions, which will be recorded on the associated review record.
- work with others and contribute to effective working relationships within an Engineering Construction environment
- communicate by keeping others informed about work plans or activities which may affect them and seek assistance from others without causing undue disruption to normal work activities

L3 EPA Engineering Construction Pipefitter

EPA Specification Section 7 – Supporting documents

- Gateway Eligibility Report
- Cohort Registration Form
- Practice Knowledge Assessment, with Answer Scheme
- MOET Portfolio Checklist and Portfolio Index

Contacts

This specification has been designed to provide all the advice and guidance you need to prepare yourself and your apprentices for endpoint assessment. However, if you have any further questions please contact the EUIAS Help Desk using one of the following:

Help Desk email: enquiries@euias.co.uk
Help Desk telephone: 0121 713 8310

EUIAS End-point Assessment for Engineering Construction Pipefitter
Gateway Eligibility Report

(Standard Version: ST0162 version 1.1; Assessment Plan Version: ST0162/AP02)

Apprentice's details

Apprentice's name:	Apprentice's job title:
Name of Employer:	Name of Training provider:
Employer representatives present:	Training provider representatives present:
Apprenticeship start date:	Apprenticeship on-programme end date:
Gateway meeting date:	
Has the apprentice taken any part of the end-point assessment for this apprenticeship standard with any other End Point Assessment Organisation?	Y / N
If "Yes" please give details:	

Eligibility requirements:

The apprentice must confirm their achievement of the following:

Eligibility requirement	Achieved by the apprentice? Y/N	Evidence (scans of certificates MUST be included)
Achieved Level 3 Diploma in Installing Engineering Construction Plant and Systems - pipefitting		
Achieved English Level 2		
Achieved Maths Level 2		

Gateway Eligibility Declaration

The apprentice, the employer and the training provider must sign this form to confirm that they understand and agree to the following:

1. The apprentice has completed the required on-programme elements of the apprenticeship and is ready for end-point assessment with EUIAS
2. The apprentice will only submit their own work as part of end-point assessment
3. All parties agree that end-point assessment evidence may be recorded and stored by EUIAS for quality assurance purposes
4. The apprentice has been on-programme for a minimum duration of 365 days
5. The apprentice has achieved the 'Level 3 Diploma in Installing Engineering Construction Plant and Systems'.
6. The apprentice has achieved the mathematics and English requirements as detailed in this document
7. The apprentice, if successful, gives permission for EUIAS to request the apprenticeship certificate from the ESFA who issue the certificate on behalf of the Secretary of State
8. The apprentice has been directed to the EUIAS Appeals Policy and Complaints Policy
9. The employer/training provider has given the EUIAS at least three months' notice of requesting this EPA for this apprentice
10. If the Gateway Eligibility Report is not completed in full, meeting all requirements, and submitted to EUIAS, the end-point assessment cannot take place

Signed on behalf of the employer (print name):	Signature:	Date:
Signed on behalf of the training provider (print name):	Signature:	Date:
Apprentice's name (print):	Signature:	Date:

EUIAS use only:	
EUIAS Sign off:	
Comments/actions:	

Engineering Construction Pipefitter - Sample Knowledge Test

Please write clearly in block capitals below	
Company name	
First name (s)	
Last name (s)	
Date of birth	
Apprentice number	
Apprentice signature	
Date of knowledge test	

Standard: **Engineering Construction Pipefitter**
Duration: **90 minutes**

Materials

For this paper you must have:

- Pens
- Calculators and reference documents are not required

Instructions

- Use black or blue ink or black ball-point pen
- Fill in the boxes at the top of this page
- Answer **all** questions
- There are questions, possible answers as well as a column for you to mark your answer
- Mark your answer with an ☒ against the possible answer you think is correct- if you wish to change your answer please put a line through ~~☒~~ and re-select with another ☒
- Only one answer per question allowed. Answers which do not follow the rules of selection will be disallowed. This may impact on the grade awarded
- Do all rough work in this answer book, spare paper is provided in this answer booklet and can be used but **MUST NOT** be removed
- Additional spare paper will not be provided
- All questions are closed book

Sample:

London is the capital of….

Example Question		
London is the capital of…		
Possible answers		**Answer**
a)	Wales	~~X~~
b)	Scotland	
c)	Northern Ireland	
d)	England	X

Advice

- You are not allowed to leave the examination room for the duration of the assessment
- Do not spend too long on one question
- Read all questions thoroughly before starting your examination
- Mobile phones and watches must not be taken into the examination room. The examination must be conducted under examination conditions i.e. you may not speak to other candidates, if you have a problem raise your hand and the invigilator will attend
- Cheating: you will be asked to leave the examination room and will be classified an automatic fail and referred to your employer

Do not turn over the page or begin the knowledge test until the invigilator instructs you to

Question 1		
Hand-arm vibration syndrome (HAVS) can be caused by operating hand-held grinders. Which of the following symptoms could indicate that a person is suffering with HAVS?		
Possible answers		**Answer**
a)	Decreased grip strength	
b)	Persistent discomfort in the eye	
c)	Swollen legs	
d)	Ringing in the ears	

Question 2		
Identify ONE reason for taking a hydro pressure test up in increments.		
Possible answers		**Answer**
a)	To allow for the pipe to expand gradually.	
b)	To check for leaks at lower pressures	
c)	To ensure pump reservoir is kept topped up.	
d)	To reduce the likelihood of a test failure	

Question 3			
What does this COSHH (Control of Substances Hazardous to Health) symbol mean?			
Possible answers		**Answer**	
a)	The substance is an irritant		
b)	The substance is harmful		
c)	The substance is toxic		
d)	The substance is corrosive		

Question 4		
What is the legislation that covers the handling of bolt lubricants?		
Possible answers		**Answer**
a)	RIDDOR (Reporting of Injuries, Diseases and Dangerous Occurrences Regulations)	
b)	LOLER (Lifting Operations and Lifting Equipment Regulations)	
c)	PUWER (Provision and Use of Work Equipment Regulations)	
d)	COSHH (Control of Substances Hazardous to Health)	

Question 5		
Which piece of legislation covers the maintenance of pressure testing equipment?		
Possible answers		**Answer**
a)	PUWER	
b)	RIDDOR	
c)	COSHH	
d)	LOLER	

Question 6		
Which one of the following cards is **NOT** a recognised site safety passport scheme?		
Possible answers		**Answer**
a)	CCNSG	
b)	CSCS	
c)	EQUITY	
d)	EMMS	

Question 7		
A toxic alert siren is heard on a petrochemical site. What action should be taken?		
Possible answers		**Answer**
a)	Monitor the work area until the emergency services arrive	
b)	Make the job safe and go to the nearest toxic refuge. Ensure all windows and doors are securely shut	
c)	Go straight to the designated muster point, making sure you are accounted for	
d)	Await instructions from the supervisor	

Question 8		
What does it mean when a risk is reduced to ALARP?		
Possible answers		**Answer**
a)	There will be no accidents resulting from the risk	
b)	The risk controls in place are better than just good practice	
c)	The degree of risk has specified level	
d)	The risk controls have been considered alongside the measures needed to control the risk	

Question 9		
A disc is being changed on a portable grinder. What is the first safety precaution that should be taken?		
Possible answers		**Answer**
a)	Make sure the disc is the right speed for the grinder	
b)	Make sure the correct spanner is used for the task	
c)	Make sure the machine is isolated from the electricity supply	
d)	Make sure the guard is correctly connected	

Question 10		
Where should waste oil be disposed of?		
Possible answers		**Answer**
a)	In a special waste tank	
b)	Down the drain	
c)	With the general wate	
d)	In an incinerator	

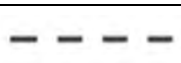
Question 11		
In relation to pipe work, what does the term 'schedule' refer to?		
Possible answers		**Answer**
a)	Work plans	
b)	The drawing	
c)	Wall thickness of pipe	
d)	Time doing the task	

Question 12		
On an isometric drawing what do the initials FW refer to?		
Possible answers		**Answer**
a)	Field weld	
b)	Flange	
c)	Floorplan	
d)	Water supply	

Question 13		
What are the angles used in an isometric drawing?		
Possible answers		**Answer**
a)	15 degrees & 30 degrees	
b)	30 degrees & 60 degrees	
c)	45 degrees & 90 degrees	
d)	180 degrees & 360 degrees	

Question 14		
What is the difference of elevation on a length of pipe on a drawing known as?		
Possible answers		**Answer**
a)	A drop	
b)	A gradient	
c)	A height	
d)	A fall	

Question 15		
Where would the information to determine the specified material for fabrication of a pipe spool be found?		
Possible answers		**Answer**
a)	General Arrangement	
b)	Rams	
c)	Toolbox Talk	
d)	Isometric drawing	

Question 16		
Which of the following P&ID symbols represents a hydraulic line?		
Possible answers		**Answer**
a)		
b)		
c)		
d)		

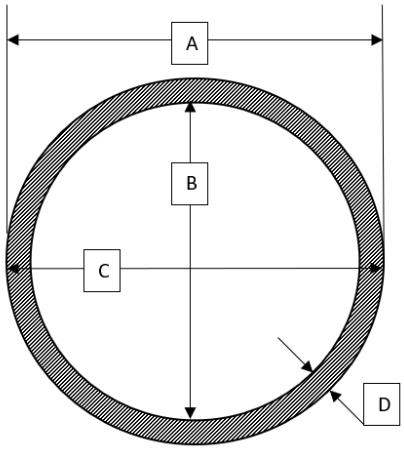
Question 17		
Calculate the area of a right-angled triangle with sides of 3m, 4m and 5m.		
Possible answers		**Answer**
a)	$3m^2$	
b)	$6m^2$	
c)	$12m^2$	
d)	$15m^2$	

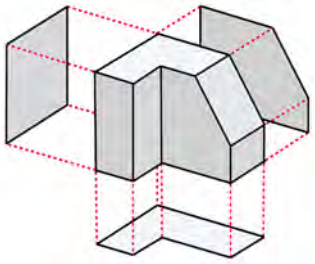
Question 18		
What information is needed to calculate the PCD (Pitch Circle Diameter) for a flange?		
Possible answers		**Answer**
a)	Number of holes, diameter of holes and distance between adjacent holes	
b)	Bolt diameter, coefficient of friction and bolt stress	
c)	Flange outside diameter, bolt size and pipe Nominal Bore	
d)	Raised face diameter, flange diameter and flange thickness	

Question 19		
What is the circumference to the nearest mm for 100mm Nominal Bore pipe?		
Possible answers		**Answer**
a)	314mm	
b)	414mm	
c)	514mm	
d)	614mm	

Question 20		
What is the formula used to determine the measurement from the centre of a 90 degree long radius elbow to the edge of prep?		
Possible answers		**Answer**
a)	1 x the Nominal Bore (NB)	
b)	2 x the NB	
c)	1 ½ x the NB	
d)	1 ¼ x the NB	

Question 21			
What is the marking out tool shown below?			
Possible answers		**Answer**	
a)	Vernier height gauge		
b)	Surface gauge		
c)	Vernier calliper		
d)	Thread gauge		

Question 22			
Refer to the diagram below. Which measurement is the Nominal Bore?			
Possible answers		**Answer**	
a)	A		
b)	B		
c)	C		
d)	D		

Question 23			
What type of drawing is shown below?			
Possible answers		**Answer**	
a)	Isometric		
b)	Orthographic		
c)	P&ID (Piping and Instrumentation Diagram)		
d)	GA (General Arrangement)		

Question 24		
A bend is marked out. The height is 300mm and the length is 400mm. What is the travel?		
Possible answers		**Answer**
a)	300mm	
b)	400mm	
c)	500mm	
d)	600mm	

Question 25		
What is the appropriate tool for cutting and shaping sch80 stainless steel pipe?		
Possible answers		**Answer**
a)	Handheld angle grinder	
b)	Plasma cutter	
c)	Air arc cutter	
d)	Pipe prep machine	

Question 26		
What is the largest sized nominal bore pipe that can be safely bent using a manual hydraulic bender?		
Possible answers		**Answer**
a)	1”	
b)	2”	
c)	3”	
d)	4”	

Question 27		
What is the most appropriate tool for assembling a barrel nipple?		
Possible answers		**Answer**
a)	Combination spanner	
b)	Adjustable spanner	
c)	Torque wrench	
d)	Pipe wrench	

Question 28		
What is the purpose of a check valve?		
Possible answers		**Answer**
a)	Prevent the back flow of the product	
b)	Control the flow of the product	
c)	Relieves pressure of the product	
d)	Change the direction of the product	

Question 29		
What is the torque value of flange bolts measured in?		
Possible answers		**Answer**
a)	Newton-metres	
b)	Kilojoules	
c)	Lumens	
d)	Decibels	

Question 30		
What is used to prevent creasing when bending 15mm copper?		
Possible answers		**Answer**
a)	Spring	
b)	Sand	
c)	Blow torch	
d)	Hydraulic oil	

Question 31		
A vessel is being tested with water. What is the purpose of having one gauge at the top and one at the bottom?		
Possible answers		**Answer**
a)	The pressure will be greater at the bottom than the top	
b)	It will ensure entire vessel is pressurised to the correct test pressure	
c)	It will ensure that the vessel will fill with water quicker	
d)	It will ensure the test will pressurise faster	

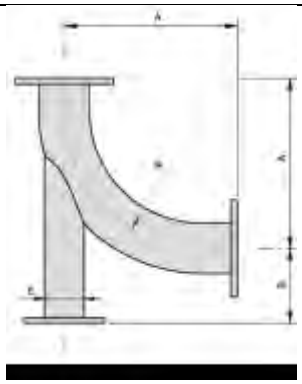
Question 32		
Which of the following is the most appropriate test medium for stainless steel pipe work?		
Possible answers		**Answer**
a)	Potted water	
b)	De-mineralised water	
c)	Hydraulic oil	
d)	Nitrogen	

Question 33		
What is the name for an alloy of copper, nickel and iron?		
Possible answers		**Answer**
a)	Chrome Molybdenum	
b)	Cunifer	
c)	Duplex	
d)	Super Duplex	

Question 34		
What is an elbolet?		
Possible answers		**Answer**
a)	A small elbow	
b)	A branch from the back of an elbow.	
c)	A 45-degree elbow	
d)	A 180-degree elbow	

Question 35		
What is the most important reason for segregating stainless steel pipe from carbon pipe?		
Possible answers		**Answer**
a)	Keep the pipes in a safe area	
b)	Pipes may get mixed up	
c)	Cross contamination	
d)	Makes them easier to identify	

Question 36			
What is the support in this drawing commonly known as?			
Possible answers		**Answer**	
a)	Crow foot support		
b)	Swan foot support		
c)	Duck foot support		
d)	Hens foot support		



Question 37		
What material is pipe made from if the grade number is 316L?		
Possible answers		**Answer**
a)	Chrome Molybdenum	
b)	Carbon steel	
c)	Copper	
d)	Stainless steel	

Question 38		
What type of component does SORF refer to?		
Possible answers		**Answer**
a)	Flange	
b)	Gasket	
c)	Weldolet	
d)	Orifice plate	

Question 39		
Which one of the following is NOT a form of metal protection?		
Possible answers		**Answer**
a)	Sacrificial anode	
b)	Galvanisation	
c)	Paint	
d)	Dye penetration	

Question 40		
Which ONE of the following materials is most resistant to corrosion/rust?		
Possible answers		**Answer**
a)	Copper	
b)	Iron	
c)	Carbon steel	
d)	Plastic	

Question 41		
What is good practice when breaking a flanged joint?		
Possible answers		**Answer**
a)	Checking what the medium is	
b)	Checking the line is isolated and drained	
c)	Completing checklists and records as required	
d)	Checking all components are to specification	

Question 42		
What is the method normally used to detect external pipe wall laminations in stainless steel pipe work?		
Possible answers		**Answer**
a)	MPI (Magnetic Particle Inspection)	
b)	Ultrasonic	
c)	Dye pen	
d)	Pressure test	

Question 43			
What is the name of the component shown below?			
Possible answers		**Answer**	
a)	Bellows		
b)	Spring flange		
c)	Coiled flange		
d)	Spiralled support		

Question 44		
What is the result of tightening a bolt to its yield point?		
Possible answers		**Answer**
a)	The bolt breaks in two	
b)	The bolt is tightened correctly	
c)	The bolt won't return to its original length	
d)	The bolt heats up under pressure	

Question 45		
What medium is used for pressure testing high-pressure gas lines?		
Possible answers		**Answer**
a)	Nitrogen helium	
b)	Hydraulic oil	
c)	De-mineralised water	
d)	Potted water	

Question 46		
What is the hydrostatic test pressure of a system in relation to its design pressure?		
Possible answers		**Answer**
a)	1 x the safe working pressure	
b)	1 ¼ x the safe working pressure	
c)	1 ½ x the safe working pressure	
d)	2 x the safe working pressure	

Question 47		
A leak is discovered on an under-pressure flanged pipe spool. What is the next step?		
Possible answers		**Answer**
a)	Wipe up the water and tighten up the bolts whilst the spool is under pressure	
b)	Drop the pressure 50% and then retighten the bolts	
c)	Drop the pressure to zero then investigate the leak	
d)	Drop the pressure to 25% then fix the leak retighten the bolts	

Question 48		
When determining materials required for a pipe installation, what does the term spiral wound refer to?		
Possible answers		**Answer**
a)	Elbow	
b)	Gasket	
c)	Flange	
d)	Pipe support	

Question 49		
The ASME/ANSI A13.1 Standard helps identify the type of hazardous materials in a piping system. Which colour is used to indicate that compressed air is being transported in a piping system?		
Possible answers		**Answer**
a)	Blue	
b)	Green	
c)	Brown	
d)	Orange	

Question 50		
What does British Standard Pipe (BSP) set the standards for?		
Possible answers		**Answer**
a)	Screw threads	
b)	Buttwelding ends	
c)	Wall thicknesses for different pressure uses	
d)	Pipe flanges	

End of Knowledge Test

Practice Knowledge Test

Answer scheme

Question	Answer
1	A
2	B
3	D
4	D
5	A
6	C
7	B
8	D
9	C
10	A
11	C
12	A
13	B
14	D
15	D
16	B
17	B
18	A
19	A
20	C
21	B
22	B
23	B
24	C
25	A

Question	Answer
26	C
27	D
28	A
29	A
30	A
31	B
32	B
33	B
34	B
35	C
36	C
37	D
38	A
39	D
40	D
41	B
42	C
43	A
44	C
45	A
46	C
47	C
48	B
49	A
50	A

ECP Sample Brief and Supporting Documentation for Practical Assessment

Instructions

The practical observed assessment will be delivered in a strictly controlled environment. The assessment will be invigilated by an Independent Assessor from EUIAS. During the test the Independent Assessor will question the apprentice to ascertain the breadth and depth of their underpinning knowledge. The Independent Assessor will record the answers given.

This assessment has a 55% weighting towards the overall score and grading.

Apprentices have maximum 8 hours to complete the task. The exact duration is like the time expected for a competent pipefitter to complete a similar task.

The test will take the form of one holistic pipefitting task where the apprentice must work to the tolerances and specifications stated in an engineering drawing to fabricate, assemble, install, test and then dismantle a piping assembly.

Health and safety and potential risks are an essential part of this assessment. Safety requirements and codes of practice associated with fabrication engineering must be understood and implemented by the apprentice. In order to pass this assessment all aspects of safety must be demonstrated. **Failure to do so will result in the assessment being halted**.

You must not modify the requirements of the engineering drawing provided to make it more relevant to local needs.

You must use one of the engineering drawings provided by EUIAS. The drawing should be printed on A3 paper.

You will also require

- The dimensions tolerances sheet
- A rig to fit the piping assembly to. EUIAS will provide the rig for the period of the assessment.

During the assessment the apprentice pipefitter should demonstrate the following skills:

- Engineering practices and principles including reading engineering drawings and marking out techniques,
- Mathematical techniques and formula related to the fabrication, development and installation of pipework systems,
- Correct selection and safe use of hand tools, mechanical tools and equipment in for the fabrication, repair, installation and decommissioning of a pipework system
- Application of knowledge of common and specialist pipe materials such as ferrous, non-ferrous and non-metallic including fittings associated with the pipework components and systems
- Pipework preparation, fabrication, installation, testing and decommissioning techniques commonly used throughout the Engineering Construction industry
- Application of appropriate codes, practices and industry standards to ensure quality requirements are met.

During the assessment the apprentice pipefitter should demonstrate the following behaviours:

- Solving problems by applying technical skills and knowledge to define, identify, evaluate and select alternative solutions if required
- Take responsibility as an individual for the quality of the work
- Work safely in accordance with health, safety and environmental legislation, regulations and company-specific requirements
- Maintain a safe, clean and tidy work area
- Check for and identify potential hazards in the workplace and take responsibility to maintain a safe working environment.

Resources used to complete the tasks

Apprentices will need access to the following resources

- A workshop with a range of hand tools, mechanical tools and equipment for the fabrication, installation and decommissioning of a pipework system
- Health and safety equipment
- The raw materials and sundries required to produce the fabricated parts
- The rig to bolt their completed assembly onto. This is provided by EUIAS.

Guidance for apprentices

You have responsibility to read the assignment carefully and to understand what you need to do. You may seek clarification from the Independent Assessor if you are unsure of requirements.

Health and safety and potential risks are an essential part of this assessment. In order to pass this assessment all aspects of safety must be demonstrated. **Failure to follow safety procedures will result in the assessment being halted**.

Task overview

The assessment will involve the fabrication of a pipe spool containing diverse ways of assembling pipework.

The assembled spool will be pressure tested before installation.

The three parts of the spool will be assembled as a joint operation.

The completed fabrication should be lifted into place onto the rig and bolted into position.

After installation the spool will be safely dismantled to its individual component pieces.

Resources

- A workshop with a range of hand tools, mechanical tools and equipment for the fabrication, repair, installation and decommissioning of a pipework system
- Health and safety equipment
- The raw materials and sundries required to produce the fabricated parts
- A rig to bolt their completed assembly onto
- The engineering drawing, provided by EUIAS
- Pressure testing template, provided by EUIAS
- Access to appropriate supporting documentation such as risk assessments, dimension tolerances.

Conditions

- Duration: maximum 8 hours
- Conditions: Controlled and invigilated by an Independent Assessor
- Materials: as stated in the engineering drawing.

Task detail

Identify health and safety aspects associated with pipework fabrication

a. Extract information from current specifications to indicate legal and site requirements.
b. Determine the actions required to prepare the work area for the fabrication of the pipe spool
c. Determine the arrangements that may need to be made to achieve safe access when installing the spool
d. Complete a personal risk assessment.

Interpret information and marking out pipe work materials

a. Apply safe working practices
b. Interpret the drawing of the spool.

Preparation, joining and erection of pipe work assemblies

a. Apply safe practices
b. Cut the appropriate pipe sizes after producing a cutting list
c. Prepare and clean pipe and fittings for fabrication-
d. Bend pipework safely using hydraulic bender to measurements within specified tolerances specified on the drawing
e. Safely thread pipework ready for the fitting
f. Fabricate spool using the most economic methods ready for installation.

Installation and testing of pipe work systems

a. Apply safe practices
b. Prior to installation the spool is to be pressure tested using the hydrostatic testing method stated. The spool will then be depressurised and drained safely.
c. Using the correct lifting equipment and methods safely lift spool to correct position.
d. Using the correct tightening sequence safely bolt spool into position.

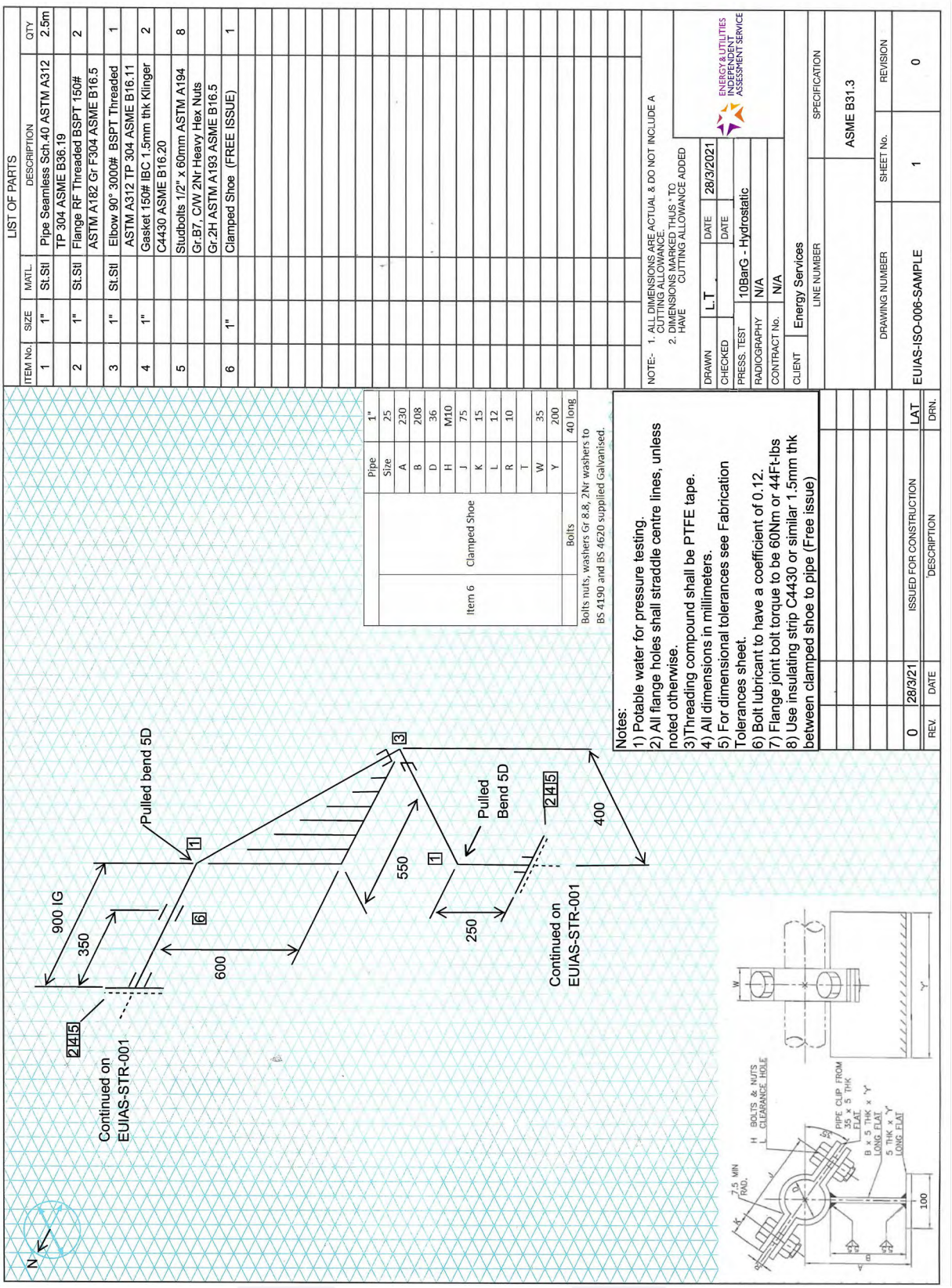
Recover tools, area and equipment

a. Apply safe practices
b. Make all isolations and disconnections in line with approved procedures
c. Remove the required components using the correct techniques and tools
d. Correctly record and store components for reuse
e. Dispose of any waste in line with procedures and regulations.

Sample Engineering Drawing

A copy of the drawing can be downloaded from EUIAS website

[EPA Resources - End Point Assessment (euias.co.uk)]



Safety Pressure Test Report

General Information			
Report no.		Test location	
Test Date		Piping Assembly Reference	
Type of Test	☐ Hydrostatic	☐ Pneumatic	
Required Test Pressure		Test Duration	
Test Medium		Test Material	

Testing			
Start Time		End Time	
Test Pressure at Start		Test Pressure at End	
Actual Test Fluid Temperature		Actual Holding Time	
Environmental Controls			
Test Area Controls (e.g. signage, barricades)			

Test Equipment Used (e.g. Gauge, Pressure Recorder, Temperature Recorder)				
Type	Description / Serial Number	Pressure Range	Calibration date	Certificate Number

Test Result			
Results			
Pressure Test	☐ Satisfactory	☐ Unsatisfactory (explain)	
Remarks / Additional Information			
This is to certify that the above item has been tested satisfactorily using the parameters specified			
Apprentice performing test		Signature	Date
Witnessed by IA Inspecting Test		Signature	Date

ECP Evidence Report for Structured Professional Review

Full Name of Apprentice	
Employer	

Demonstrating your competence

You will need to demonstrate your competence to carry out tasks correctly, safely, effectively and consistently. To achieve this requires the right level of knowledge, understanding, skills and behaviours.

Your evidence will need to demonstrate how you:

- apply proven technical techniques and procedures to the solution of practical engineering problems.
- have the ability to carry out supervisory or technical responsibility.
- contribute to the design, development, manufacture, commissioning, decommissioning, operation or maintenance of products, equipment, processes or services.
- manage and apply safe systems of working.
- show evidence of interpersonal skills in communicating technical matters, and commitment to professional engineering values.

The questions in this form is your chance to set out the experience you have from **three different** jobs, projects or tasks that demonstrate these competences.

- Keep the evidence personal. Use terms such as 'I built, made, tested….'
- Avoid unnecessary or unexplained abbreviations

Please save this form and supporting evidence as one pdf document before submitting it.

The form must be signed and authenticated by you and your supervisor

Declaration

Apprentice's declaration

I certify the information contained in this report and any accompanying documentation is correct.

Signature: ---------- Date: ----------

Supervisor's declaration

I confirm I have known the apprentice for a minimum of one year. To the best of my knowledge, all the information contained in this report is correct.

Name: ----------

Signature: ---------- Date: ----------

SECTION ONE

Pipefitting experience

Describe your roles and responsibilities carefully and concisely.

This is intended to give the panel members an **overview** of your particular working environment.

SECTION TWO

In this section you need to provide evidence that shows you

- Understand the required standards of workplace performance and behaviours
- Can identify how your performance meets the standard
- Have reflected on your learning
- Have met the content of the UK Spec for EngTech.

You should describe your role and contribution to specific projects, activities or tasks, so that you can clearly show how you have become more competent.

Give an example of a project or task where you solved a technical problem, explaining your role and how you selected the appropriate techniques, procedures and methods used.

Include details about any scientific, technical or engineering principles you used

[450-500 words]

Reference to ECP Standard (ST0162/AP02)

S2 Correctly select and safely use tools and equipment for the fabrication, assembly, installation and decommissioning of pipework components and systems
S3 Plan, organise and undertake the fabrication, assembly, installation, maintenance and decommissioning of pipework components and systems
S4 Read, interpret and apply engineering drawing information
S5 Shape pipework components using hand and power tools to cut, drill, shape and finish components to the required tolerance, specification and standard
S6 Assemble and install pipework using the appropriate methods, techniques and equipment in accordance with the specification including welded, threaded, bolted and clamped jointing solutions.
S7 Ensure the integrity of joints in accordance with specifications, in line with specified quality procedures and to precise tolerances
S8 Undertake the testing and inspection of the fabricated and/or installed pipework using the appropriate techniques
S10 Apply techniques for the temporary or permanent removal of an engineering construction piping related system or component
B2 Solve problems within their area of responsibility by applying technical skills and knowledge to define, identify, evaluate and select alternative solutions if required
B6 Work safely in accordance with health, safety and environmental legislation, regulations and company-specific requirements

EngTech (UK Spec) Reference
A Use engineering knowledge and understanding to apply technical and practical skills

Give an example of how you have identified, planned, and organised the resources needed to effectively complete a project or task, explaining how you took into consideration cost, quality, safety and any environmental impact.

Remember to think about what equipment was used, and/or how data was gathered and analysed to produce the desired outcome.

[450-500 words]

Reference to ECP Standard (ST0162/AP02)

S1 Comply with appropriate health and safety, risk and quality requirements
S2 Correctly select and safely use tools and equipment for the fabrication, assembly, installation and decommissioning of pipework components and systems
S3 Plan, organise and undertake the fabrication, assembly, installation, maintenance and decommissioning of pipework components and systems
S11 Communicate by keeping others informed about work plans or activities which may affect them and seek assistance from others without causing undue disruption to normal work activities
B2 Solve problems within their area of responsibility by applying technical skills and knowledge to define, identify, evaluate and select alternative solutions if required
B3 Take responsibility as an individual and team member for the quality of the work
B6 Work safely in accordance with health, safety and environmental legislation, regulations and company-specific requirements
B7 Maintain a safe, clean and tidy work area,
B8 Check for and identify potential hazards in the workplace and take collective responsibility to maintain a safe working environment

EngTech (UK Spec) Reference

B Contribute to the design, development, manufacture, construction, commissioning, operation or maintenance of products, equipment, processes, systems or services

Give an example of how you have identified and taken responsibility for completing a task or activity that demonstrates your skills, including working to agreed procedures and codes, managing resources and assigning tasks to others.

[450-500 words]

Reference to ECP Standard (ST0162/AP02)
S1 Comply with appropriate health and safety, risk and quality requirements
S3 Plan, organise and undertake the fabrication, assembly, installation, maintenance and decommissioning of pipework components and systems
S9 Work with others and contribute to effective working relationships within an Engineering Construction environment
B2 Solve problems within their area of responsibility by applying technical skills and knowledge to define, identify, evaluate and select alternative solutions if required
B3 Take responsibility as an individual and team member for the quality of the work
B6 Work safely in accordance with health, safety and environmental legislation, regulations and company-specific requirements
B8 Check for and identify potential hazards in the workplace and take collective responsibility to maintain a safe working environment

EngTech (UK Spec) Reference
C Accept and exercise personal responsibility

Give examples of how you have contributed to discussions, meetings, presentations or reports, communicated and worked effectively with colleagues and others, showing your awareness of the importance of issues such as diversity and equality.

[450-500 words]

Reference to ECP Standard (ST0162/AP02)
S9 Work with others and contribute to effective working relationships within an Engineering Construction environment
S11 Communicate by keeping others informed about work plans or activities which may affect them and seek assistance from others without causing undue disruption to normal work activities

EngTech (UK Spec) Reference
D Use effective communication and interpersonal skills

Give an example of how you have:

- **Complied with your company's Code of Conduct**
- **Taken personal responsibility for your safety and the safety of others**
- **Contributed to sustainable development including environmental, social and economic aspects**
- **Kept in touch with developments in your technical area and continued to develop your knowledge and skills.**

[450-500 words]

Reference to ECP Standard (ST0162/AP02)
S1 Comply with appropriate health and safety, risk and quality requirements
B3 Take responsibility as an individual and team member for the quality of the work
B7 Maintain a safe, clean and tidy work area

EngTech (UK Spec) Reference
E Make a personal commitment to an appropriate code of professional conduct, recognising obligations to society, the profession and the environment

Annex 1: Checklist of appropriate codes, practices and industry standards (K9)

Piping design codes	
ASME B31 - American Society of Mechanical Engineers (ASME) code for pressure piping	ASME B31.1 - Power piping ASME B31.2 - Fuel Gas piping ASME B31.3 - Process piping ASME B31.4 - Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids ASME B31.5 - Refrigeration Piping and Heat Transfer Components ASME B31.8 - Gas Transmission and Distribution Piping Systems. ASME B31.8S - Managing System Integrity of Gas Pipelines. ASEM B31.9 - Building Services Piping. ASME B31.11 - Slurry Transportation Piping Systems. ASME B31.12 - Hydrogen Piping and Pipelines. ASME B31G - Manual for Determining Remaining Strength of Corroded Pipelines.
ISO EN 13480 – European metallic industrial piping	ISO EN 13480-1 – General ISO EN 13480-2 – Materials ISO EN 13480-3 – Design & Calculation ISO EN 13480-4 – Fabrication & installation ISO EN 13480-5 – Inspection & testing ISO EN 13480-6 – Additional requirements for buried piping ISO EN 13480-7 - Metallic industrial piping Guidance on the use of conformity assessment procedures ISO EN 13480-8 - Additional requirements for aluminium and aluminium alloy piping
ASME Dimensional Standards	
	B1.20.1 - Pipe Threads, General Purpose (Inch) B16.1 - Cast Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250 B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300 B16.5 - Pipe Flanges and Flanged Fittings NPS 1/2 Through NPS 24 Metric/Inch Standard B16.9 - Factory-Made Wrought Buttwelding Fittings B16.10 - Face-to-Face and End-to-End Dimensions of Valves B16.11 - Forged Fittings, Socket-Welding and Threaded B16.20 - Metallic Gaskets for Pipe Flanges: Ring-Joint, Spiral-Wound, and Jacketed B16.21 - Nonmetallic Flat Gaskets for Pipe Flanges B16.25 - Buttwelding Ends

	B16.28 - Wrought Steel Buttwelding Short Radius Elbows and Returns B16.34 - Valves: Flanged, Threaded, and Welding End B16.36 - Orifice Flanges B16.39 - Malleable Iron Threaded Pipe Unions B16.42 - Ductile Iron Pipe Flanges and Flanged Fittings, Classes 150 and 300 B16.47 - Large Diameter Steel Flanges (NPS 26 Through NPS 60) B16.48 - Steel Line Blanks B36.10 - Welded and Seamless Wrought Steel Pipe B36.19 - Stainless Steel Pipe
Flange joint integrity	ASME PCC-1 - Guidelines for Pressure Boundary Bolted Flange Joint Assembly BS EN 1591-4 - Flanges and their joints. Qualification of personnel competency in the assembly of the bolted connections of critical service pressurized systems Energy Institute (EI) - Guidelines for the Management of the Integrity of Bolted Joints in Pressurised Systems
The Manufactures Standardisation Society (MSS)	
	MSS-SP-6 - Standard Finishes for Contact Faces of Pipe Flanges and Connecting-End Flanges of Valves and Fittings MSS-SP-9 - Spot Facing for Bronze, Iron and Steel Flanges MSS-SP-25 - Standard Marking Systems for Valves, Fittings, Flanges, and Unions MSS-SP-42 - Class 150 (PN 20) Corrosion Resistant Gate, Globe, Angle and Check Valves With Flanged and Butt Weld Ends MSS-SP-43 - Wrought Stainless Steel Butt-Welding Fittings Including Reference to Other Corrosion Resistant Materials MSS-SP-44 - Steel Pipe Line Flanges MSS-SP-45 - Bypass and Drain Connections MSS-SP-51 - Class 150LW Corrosion Resistant Flanges and Cast Flanged Fittings MSS-SP-58 - Pipe Hangers and Supports MSS-SP-65 - High Pressure Chemical Industry Flanges and Threaded Stubs for Use with Lens Gaskets MSS-SP-69 - Pipe Hangers and Supports MSS-SP-70 - Cast Iron Gate Valves, Flanged and Threaded Ends MSS-SP-71 - Gray Iron Swing Check Valves, Flanged and Threaded Ends MSS-SP-72 - Ball Valves With Flanged or Buttwelding Ends for General Service MSS-SP-75 - Specifications for High Test Wrought Buttwelding Fittings

	MSS-SP-79 - Socket-Welding Reducer Inserts MSS-SP-81 - Stainless Steel, Bonnetless, Flanged, Knife Gate Valves MSS-SP-83 - Class 3000 Steel Pipe Unions, Socket-Welding and Threaded MSS-SP-85 - Gray Iron Globe and Angle Valves, Flanged and Threaded Ends MSS-SP-88 - Diaphragm Type Valves MSS-SP-95 - Swage(d) Nipples and Bull Plugs MSS-SP-97 - Integrally Reinforced Forged Branch Outlet Fittings
ASTM International – American Society for Testing and Materials	
ASTM Materials for steel pipes	A-53 - Welded and Seamless Steel Pipe A-106 - Seamless Carbon Steel Pipe for High-Temperature Service A-120 - Pipe, steel, black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Ordinary Uses A-134 - Electric Fusion (Arc)-Welded Steel Plate Pipe (Sizes 16 in. and Over) A-135 - Electric-Resistance-Welded Steel Pipe A-139 - Electric-Fusion (Arc)-Welded Steel Plate Pipe (Sizes 4 in. and Over) A-155 - Electric-Fusion-Welded Steel Pipe for High-Pressure Service A-211 - Spiral-Welded Steel or Iron Pipe A-312 - Seamless and Welded Austenitic Stainless Steel Pipe A-333 - Seamless and Welded Steel Pipe for Low Temperature Service A-335 - Seamless Ferritic Alloy Steel Pipe for High-Temperature Service A-358 - Electric-Fusion-Welded Austenitic Chromium-Nickel Alloy Steel Pipe for High Temperature Service A-369 - Carbon and Ferritic Alloy Steel Forged and 80red Pipe for High Temperature Service A-376 - Seamless Austenitic Steel Pipe for High-Temperature Central-Station Service A-381 - Metal-Arc-Welded Steel Pipe for High-Pressure Transmission Systems A-405 - Seamless Ferritic Alloy Steel Pipe Specially Heat Treated for High Temperature Service A-523 - Plain End Seamless and Electric-Resistance-Welded Steel Pipe for High Pressure Pipe-Type Cable Circuits A-524 - Seamless Carbon Steel Pipe for Process Piping A-530 - General Requirements for Specialized Carbon and Alloy Steel Pipe API-5L - Line Pipe API-5LX - High-Test Line Pipe API-5LS - Spiral Weld Line Pipe

ASTM Materials for butt welding fittings	A234 - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service. A420 - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Low-Temperature Service. A403 - Standard Specification for Wrought Austenitic Stainless Steel Piping Fittings.
ASTM Materials for forgings	A105 - Standard Specification for Carbon Steel Forgings for Piping Applications. A181 - Standard Specification for Carbon Steel Forgings, for General-Purpose Piping. A182 - Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service. A350 - Standard Specification for Carbon and Low-Alloy Steel Forgings, Requiring Notch Toughness Testing for Piping Components.
ISO 9001 – Implementation of quality management systems	
ISO 14001 – Environmental management systems	
ISO 45001 – Occupational health and safety management systems	
Company quality assurance and quality control procedures	