



Competency Pathway

Foundation (ExF) Training, NQ & Practicing Technicians & Non-Tech Foundation: Theory



Industries

- Principal to all Ex environments

Entry Quals

- No entry qualification requirements

Entry Knowledge - Expected

- Understands general safe working practices
- Is aware of general H&S legislation and guidance

Entry Skills

- No practical skills required

Job Roles

- New to working in Ex environments
- Trainee, Newly Qualified & Practicing Technicians
- Non-Technical Personnel (on-site)

Entry Experience

- No prior experience of working in Ex environments

Entry Knowledge - Desirable

- Has a basic understanding of Ex environments
- Understands the necessity for safe working practices in Ex environments

Foundation (ExF+)

Training, NQ & Practicing Technician new to Ex Foundation Plus: Theory & Practical



Industries

- Principal to all Ex environments

Entry Quals

Qualifications consistent with a craftsperson in the areas of Electrical, Instrumentation or Mechanical disciplines, e.g. Min NVQ level 2

Entry Knowledge - Expected

- Understands general safe working practices
- Is aware of general H&S legislation and guidance

Entry Skills - Expected

- Practical skills in engineering assembly of a complexity consistent with a craftsperson in the subject areas of electrical, instrumentation or mechanical fitter.

Job Roles

- New to working in Ex environments
- Trainee, Newly Qualified & Practicing Technicians
- Other categories of Technical Personnel (on site)

Entry Experience

- No prior experience of directly working in Ex environments

Entry Knowledge - Desirable

- Has a basic understanding of Ex environments
- Understands the necessity for safe working practices in Ex environments

Entry Skills - Desirable

- Can identify, select and use appropriate practical skills, methods and procedures when working in Ex environments, as required for:
- Glanding and terminating industrial low voltage cables
- Installing and terminating certified Ex cable glands and conductors

Functional Safety (FSF)

Operatives, Technicians, Engineers & Managers Functional Safety: Equipment & Systems



Industries

- Principal to all Ex environments

Entry Quals Guidance

- RQF Level: 3**
- National Vocational Qual (NVQ)
 - National Diploma (ND)
- Discipline:**
- Electrical / Electronic
 - Mechanical
 - Non-Technical

Entry Knowledge - Expected

- Know the relevant legislative, regulatory, local requirements and procedures for safe working practice and systems of work in an industrial setting
- Is aware of general H&S legislation and guidance
- Interprets basic manufacturer's instructions and guidance

Entry Skills - Expected

- No practical skills required

Job Roles *Aspiring to or operating in*

- Trainee, Newly Qualified & Practicing Technicians
- Non-Technical Personnel (on site)

Entry Experience Guidance

- No prior experience of working in Ex environments

Entry Knowledge - Desirable

- Recognises typical Ex environments
- Has factual, procedural and theoretical understanding of Ex environments
- Is aware of the concept of functional safety and safety integrity levels (SIL)
- Understands the necessity for safe working practices in Ex environments and basic protection concepts used for certifying Ex equipment
- Is aware that working in Ex environments is regulated by industry standards and international standards.

Entry Skills - Desirable

- Can identify, select and use appropriate skills, methods and procedures when working in Ex environments.
- Can address well-defined but potentially complex problems and use appropriate investigation to inform actions.

Gases & Vapours (Ex01 – Ex04)

Electrical / Instrument Craftpersons & Engineers

Install, Inspect & Maintain: Gases & Vapours



Industries

- Principal to all Ex environments, with direct application in hazardous vapour and gas environments

Entry Quals

Guidance

Level 3, ECS Gold Card, National Diploma or equivalent

Discipline:

- Electrotechnical
- Instrumentation

** Subject to knowledge, skill and experience candidates may benefit from ExF+*

Entry Knowledge - Expected

- Knows the relevant legislative, regulatory, local requirements.
- Understands procedures for safe working practice and systems of work in an industrial setting
- Can read and interpret relevant engineering drawings, related specifications, quality standards and equipment manuals
- Understands the hierarchy of responsibilities in relation to reporting and decision-making

Entry Skills - Expected

- Practical skills in engineering assembly of a complexity consistent with that of a level 3 craftsperson
- Can apply safe working practices including safe isolation to meet the requirements of statutory and non-statutory regulations.
- Can safely install, inspect, test, commission, diagnose and correct faults in electrical plant, instrumentation, associated cabling, cabling supports and equipment.
- Can select, gland & terminate industrial type cables to a suitable component and associated cable tray in line with details on the appropriate specification.
- Can interpret manufacturers documentation for correct installation, maintenance and inspection.

Job Roles

Aspiring to or operating in

- Installation or Maintenance Electrician
- Electrical or Instrument Technician
- Engineers

Entry Experience

Guidance

- 2 + years' experience operating in a site / industrial environment
- Installing, inspecting, testing and/or maintaining equipment in an industrial setting

Entry Knowledge - Desirable

- Understands the need for and methods of achieving safe working practice in gas and vapour Ex environments.
- Has basic practical, theoretical and technological knowledge and understanding of gas and vapour Ex environments
- Has a basic understanding of the requirements, materials and equipment considerations, in relation to working in gas and vapour Ex environments

Entry Skills - Desirable

- Can select and install a variety of Ex certified cables glands and terminate conductors into equipment.
- Can understand the principles of electrical protection concepts including selection, installation and maintenance
- Understands intrinsically safe concept of protection and installation including the importance of documentation.
- Can inspect new and existing equipment in accordance with appropriate inspection techniques relevant to the different grades of inspection

Maritime Fuels (MTEEx01 – MTEEx04)

Electrical / Instrument Craftpersons & Engineers

Inspect & Maintain: Maritime Fuels



Industries

- Maritime Ex environments involving Bunker Fuels, LNG and LPG (Low Flash point Fuels)

Entry Quals Guidance

Level 3 ECS Gold Card
National Diploma
or equivalent

Discipline:

- Electrotechnical
- Instrumentation

** Subject to knowledge, skill and experience candidates may benefit from ExF+*

Entry Knowledge - Expected

- Knows the relevant legislative, regulatory, local requirements
- Understands procedures for safe working practice and systems of work in a Maritime setting
- Can read and interpret relevant engineering drawings, related specifications, quality standards and equipment manuals
- Understands the hierarchy of responsibilities in relation to reporting and decision-making

Entry Skills - Expected

- Practical skills in engineering assembly of a complexity consistent with that of a level 3 craftsperson
- Can apply safe working practices including safe isolation to meet the requirements of statutory and non-statutory regulations.
- Can safely install, inspect, test, commission, diagnose and correct faults in electrical plant, instrumentation, associated cabling, cabling supports and equipment.
- Can select, gland & terminate industrial type cables to a suitable component and associated cable tray in line with details on the appropriate specification.
- Can interpret manufacturers documentation and certification standards for correct installation, maintenance and inspection.

Job Roles

Aspiring to or operating in

- Installation or Maintenance Electrician
- Level 3 Operatives
- Electrical or Instrument Technician
- Engineers

Entry Experience Guidance

- 2 + years' experience operating in a site / industrial environment
- Installing, inspecting, testing and/or maintaining equipment in an industrial setting

Entry Knowledge - Desirable

- Understands the need for and methods of achieving safe working practice in Maritime Ex environments.
- Has basic practical, theoretical and technological knowledge and understanding of maritime Ex environments
- Has a basic understanding of the requirements, materials and equipment considerations, in relation to working in Maritime Ex environments

Entry Skills - Desirable

- Can select and install a variety of Ex certified cable glands.
- Can understand the principles of electrical protection concepts including selection, installation and maintenance
- Understands intrinsically safe concept of protection and installation including the importance of documentation.
- Can inspect new and existing equipment in accordance with appropriate inspection techniques relevant to the different grades of inspection

Dust (Ex05 – Ex06)

Electrical / Instrument Craftpersons & Engineers Install, Inspect & Maintain: Combustible Dust



Industries

- Dust Ex environments such as animal feed processing plants, timber mills, biomass processing plants and bakeries

Entry Quals Guidance

Level 3 ECS Gold Card
National Diploma
or equivalent

Discipline:

- Electrotechnical
- Instrumentation

** Subject to knowledge, skill and experience candidates may benefit from ExF+*

Entry Knowledge - Expected

- Knows the relevant legislative, regulatory, local requirements
- Understands procedures for safe working practice and systems of work in an industrial setting
- Can read and interpret relevant engineering drawings, related specifications, quality standards and equipment manuals
- Understands the hierarchy of responsibilities in relation to reporting and decision-making

Entry Skills - Expected

- Practical skills in engineering assembly of a complexity consistent with that of a level 3 craftsperson
- Can apply safe working practices including safe isolation to meet the requirements of statutory and non-statutory regulations.
- Can safely install, inspect, test, commission, diagnose and correct faults in electrical plant, instrumentation, associated cabling, cabling supports and equipment.
- Can select, gland & terminate industrial type cables to a suitable component and associated cable tray in line with details on the appropriate specification.
- Can interpret manufacturers documentation and certification standards for correct installation maintenance and inspection.

Job Roles

Aspiring to or operating in

- Installation or Maintenance Electrician
- Level 3 Operatives
- Electrical or Instrument Technician
- Engineers

Entry Experience Guidance

- 2 + years' experience operating in a site / industrial environment
- Installing, inspecting, testing and/or maintaining equipment in an industrial setting

Entry Knowledge - Desirable

- Understands the need for and methods of achieving safe working practice in dust Ex environments.
- Has practical, theoretical and technological knowledge and understanding of combustible dust Ex environments
- Understands the requirements, materials and equipment considerations, in relation to working in combustible dust Ex environments and also understands the benefits of good housekeeping

Entry Skills - Desirable

- Can select and install a variety of Ex certified cable glands.
- Can understand the principles of electrical protection concepts including selection, installation and maintenance
- Understands intrinsically safe concept of protection and installation including the importance of documentation.
- Can inspect new and existing equipment in accordance with appropriate inspection techniques relevant to the different grades of inspection

Fuel Forecourts (Ex07 – Ex08)

Electrotechnical Craftpersons & Engineers

Install, Inspect, Test & Maintain: Fuel Filling



Industries

- Fuel Ex environments such as Petrol Filling Station Forecourts, associated fuel transfer, re-filling and storage

Entry Quals Guidance

Level 3 ECS Gold Card
National Diploma
or equivalent

Discipline:

- Electrotechnical
- Instrumentation

** Subject to knowledge, skill and experience candidates may benefit from ExF+*

Entry Knowledge - Expected

- Knows the relevant legislative, regulatory, local requirements
- Understands procedures for safe working practice and systems of work in a commercial or industrial setting
- Can read and interpret relevant engineering drawings, related specifications, quality standards and equipment manuals
- Understands the hierarchy of responsibilities in relation to reporting and decision-making

Entry Skills - Expected

- Practical skills in engineering assembly of a complexity consistent with that of a level 3 craftsperson
- Can apply safe working practices including safe isolation to meet the requirements of statutory and non-statutory regulations.
- Can safely install, inspect, test, commission, diagnose and correct faults in electrical plant, instrumentation, associated cabling, cabling supports and equipment.
- Can select, gland & terminate industrial type cables to a suitable component and associated cable tray in line with details on the appropriate specification.
- Can interpret manufacturers documentation and certification standards for correct installation, maintenance and inspection.

Job Roles

Aspiring to or operating in

- Installation or Maintenance Electrician
- Level 3 Operatives
- Electrical or Instrument Technician
- Engineers

Entry Experience Guidance

- 2 + years' experience operating in a site, commercial or industrial environment
- Installing, inspecting, testing and/or maintaining Equipment in a commercial or industrial setting

Entry Knowledge - Desirable

- Understands the need for and methods of achieving safe working practice in fuel filling Ex environments.
- Has practical, theoretical and technological knowledge and understanding of Ex fuel filling environments
- Understands the requirements, materials and equipment considerations, in relation to working in Ex fuel filling environments
- A working knowledge of the APEA "blue book" 4th edition 2018 (5th edition pending)

Entry Skills - Desirable

- Can select and install a variety of Ex certified cable glands.
- Can understand the principles of electrical protection concepts including selection, installation and maintenance
- Understands intrinsically safe concept of protection and installation including the importance of documentation.
- Can inspect new and existing equipment in accordance with appropriate inspection techniques relevant to the different grades of inspection

Water Utilities (Ex09 – Ex10)

Electrical / Instrument Craftpersons & Engineers in the Wastewater industry



Industries

- Water Utilities Ex environments involving waste water, treatment and holding

Entry Quals Guidance

Level 3 ECS Gold Card
National Diploma
or equivalent

Discipline:

- Electrotechnical
- Instrumentation

** Subject to knowledge, skill and experience candidates may benefit from ExF+*

Entry Knowledge - Expected

- Knows the relevant legislative, regulatory, local requirements
- Understands procedures for safe working practice and systems of work in an industrial setting
- Can read and interpret relevant engineering drawings, related specifications, quality standards and equipment manuals
- Understands the hierarchy of responsibilities in relation to reporting and decision-making

Entry Skills - Expected

- Practical skills in engineering assembly of a complexity consistent with that of a level 3 craftsperson
- Can apply safe working practices including safe isolation to meet the requirements of statutory and non-statutory regulations.
- Can safely install, inspect, test, commission, diagnose and correct faults in electrical plant, instrumentation, associated cabling, cabling supports and equipment.
- Can select, gland & terminate industrial type cables to a suitable component and associated cable tray in line with details on the appropriate specification.
- Can interpret manufacturers documentation and certification standards for correct installation, maintenance and inspection.

Job Roles

Aspiring to or operating in

- Installation or Maintenance Electrician
- Level 3 Operatives
- Electrical or Instrument Technician
- Engineers

Entry Experience Guidance

- 2+ years' experience operating in a Water Industry Ex environment, installing, inspecting, testing and/or maintaining Ex Certified equipment

Entry Knowledge - Desirable

- Has practical, theoretical and technological knowledge and understanding of water industry Ex environments
- Understands the need for and methods of achieving safe working practice in water industry Ex environments.
- Understands the requirements, materials and equipment considerations, in relation to working in water industry Ex environments
- A working knowledge of WIMES and water industry related specifications

Entry Skills - Desirable

- Can select and install a variety of Ex certified cable glands.
- Can understand the principles of electrical protection concepts including selection, installation and maintenance
- Understands intrinsically safe concept of protection and installation including the importance of documentation.
- Can inspect new and existing equipment in accordance with appropriate inspection techniques relevant to the different grades of inspection

Mechanical (Ex11)

Mechanical Craftpersons & Engineers

Install, Inspect & Maintain: Gases, Vapours & Dust

Industries

- Principal to all Ex environments, with direct application in hazardous gas, vapour and dust environments

Entry Quals Guidance

National Diploma , NVQ Level 3 or equivalent in a technical subject e.g. mechanical, operations, technical services, multiskilled engineering, maintenance

Discipline:

- Mechanical engineering
- Multiskilled engineering

Entry Knowledge - Expected

- Knows the relevant legislative, regulatory, local requirements
- Understands procedures for safe working practice and systems of work in an industrial setting
- Can read and interpret relevant engineering drawings, related specifications, quality standards and equipment manuals
- Understands the hierarchy of responsibilities in relation to reporting and decision-making

Entry Skills - Expected

- Can apply general safe working practices.
- Can accurately measure test components with micrometres, verniers and Dial Test Indicator and record results
- Can disassemble, clean, inspect and repair a range of mechanical components as per manufacturers specifications including rotating equipment such as fan assemblies, gearboxes, pumps and liner elements such as double acting pneumatic cylinders
- Can strip down, check dimensions, replace seals, and rebuild rotating equipment such as centrifugal pumps
- Can dismantle, assemble and hand torque flanged joints, including inspection of flanges, fault reporting, and securing a flanged pipework joint as per a specified drawing and within set tolerances

Job Roles

Aspiring to or operating in

- Mechanical, Electro-Mechanical & Multi-Skilled Craftpersons / Engineers
- Asset / Site Mechanical Maintenance Technician

Entry Experience Guidance

- 2 + years' experience operating in a site / industrial environment
- Installing, inspecting, testing and/or maintaining Equipment in an industrial setting

Entry Knowledge - Desirable

- Understands the need for and particular methods of achieving safe working practice in Ex environments.
- Has practical, theoretical and technological knowledge and understanding of Ex environments
- Understands the requirements, materials and equipment considerations, in relation to working in Ex environments

Entry Skills - Desirable

- Can safely assemble, install, maintain, test, repair and disassemble mechanical equipment and systems, working safely in Ex environments

Application Design Engineer (Ex12)

Application Design Engineers

Specify Electrical Equipment in Ex Atmospheres

Industries

- Principal to all Ex environments, with direct application in hazardous gas, vapour and dust environments

Entry Quals

Guidance

Minimum Academic route

- HNC
- HND
- Degree

Discipline: Engineering

**Or relevant demonstratable knowledge and experience.*

Entry Knowledge - Expected

- Has an understanding and is able to read and interpret engineering drawings
- Can interpret manufacturer's data for electrical equipment relevant to its application in an Ex area
- Evaluate the performance of equipment, assemblies or systems of relevance to application in Ex areas
- Should have a working knowledge of the relevant parts of IEC 60079 Part 14

Entry Skills - Expected

- No practical skills required
- Be able to analyse data effectively

Job Roles

Aspiring to or operating in

- EC&I Engineer
- EC&I Designer

Entry Experience

Guidance

- A good understanding of basic electrical application design practice.
- Have at least 2 years' experience working in Ex environments

Entry Knowledge - Desirable

- Have a level of understanding that is equivalent to or exceeds ExF
- Understand those aspects of equipment design which affect the installation of Ex equipment of IEC 60079 Part 14
- Understanding those aspects of equipment design which affect inspection and maintenance requirements of IEC 60079 Part 14

Responsible Person (Ex14)

Senior Managers & Supervisors

Managing People, Processes & Procedures



Industries

- Principal to all Ex environments, with direct application in hazardous gas, vapour and dust environments

Entry Quals

Guidance

Minimum Academic route

- HNC
- HND
- Degree

Discipline: Engineering

** Or relevant demonstratable knowledge and experience.*

Entry Knowledge - Expected

- Has a general understanding of relevant electrical engineering.
- Understands Safe systems of work including Permit to work
- Has a basic understanding of the importance of equipment inspection
- Aware of responsibilities under HSE COMAH (UK or equivalent)

Entry Skills - Expected

- No practical skills required
- Appreciation of the impact that installation, inspection and maintenance will have on plant/site operations.

Job Roles

Aspiring to or operating in

- Plant/Site/Engineering/Maintenance Manager
- Supervisor/ Technical Authority/ Duty Holder

Entry Experience

Guidance

- 2+ years' experience of supervising or managing people, processes and procedures in Ex environments
- 2+ years' experience of electrical and/or mechanical equipment, systems and installations

Entry Knowledge - Desirable

- Can read and assess relevant engineering drawings
- Has practical understanding of explosion protection principles and techniques
- Has a working knowledge and understanding of the relevant standards in explosion protection.
- Has a knowledge of quality assurance, including the principles of auditing, documentation, traceability of measurement and instrument calibration