

IFE Level 2 Certificate in Passive Fire Protection

Qualification Specification

Qualification Number: 603/3640/7

About the Institution of Fire Engineers (IFE)

The IFE is the professional institution for those working in the fire sector.

The IFE is a registered charity working for societal benefit. Founded in 1918, the IFE's mission is to promote, encourage and improve the science, practice and professionalism of fire engineering with the overall aim of protecting and saving lives. Members of the IFE share a commitment to ensuring that the fire profession remains relevant and valued, protecting people, property and the environment from fire.

The IFE Awarding Organisation

The IFE's awarding organisation is non-profitmaking.

The aim of the of the awarding organisation is to encourage those who work in the sector to engage with, and develop, the critical understanding needed to operate effectively and safely and to best professional standards so that they can protect and save lives. In doing this, the awarding organisation contributes to three of the IFE's (six) over-arching strategic priorities i.e.:

- ◆ *Facilitate awareness of fire issues and developments through the communication of ideas, knowledge and information.*
- ◆ *Foster professionalism by establishing and maintaining pathways and recognised standards of fire professionalism and competency.*
- ◆ *Increase knowledge in the science, practice and professionalism of fire engineering.*

All of the IFE's qualifications are designed for those working in the fire sector and to meet the above priorities. Qualifications and their associated assessments (examinations and practical activities/assignments) provided by the IFE are designed, assessed and quality assured by experts with extensive experience of working within the fire sector.

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IFE Level 2 Certificate in Passive Fire Protection

Introduction

The IFE Level 2 Certificate in Passive Fire Protection was originally developed by the Institution of Fire Engineers (IFE) in conjunction with industry specialists. The content and structure of the qualification has been established to cover the basic knowledge and understanding required by those working in the passive fire protection industry.

Aims of the Qualification

This qualification has been designed to recognise:

- ◆ basic knowledge and understanding related to fire science and human behaviour that affects the requirements for passive fire protection
- ◆ specialist technical understanding of passive fire protection measures and of the factors that affect effective passive fire protection measures
- ◆ specialist understanding that supports effective performance in the Passive Fire Protection Industry and those working in the Built Environment.

Target Audience

This qualification will be appropriate for individuals who are directly engaged in installing passive fire protection measures or who work with equipment and materials relevant to passive fire protection measures. It will be of interest to those who are entering into roles involving passive fire protection and also to those who are already employed in the industry who need to demonstrate that they have acquired the key knowledge and understanding relevant to their roles.

The qualification will be specifically relevant to the following roles:

- ◆ Senior Installers of passive fire protection measures
- ◆ Team Leaders/Supervisors working in passive fire protection roles
- ◆ Site Supervisors
- ◆ Technical Sales staff
- ◆ Contract Supervisors

Qualification Structure

In order to achieve the IFE Level 2 Certificate in Passive Fire Protection, candidates must achieve four mandatory Awards as follows:

- ◆ Award 1: Building structural frame and flame retardant coatings
- ◆ Award 2: Walls, floors, ceilings and glazing
- ◆ Award 3: Fire stopping, barriers, ductwork and dampers
- ◆ Award 4: Doors and shutters

Qualification Content

The content of the qualification is set out in the four units presented below. The relevant sections below provide information on the range of topics that must be studied to achieve each unit including the way in which candidates need to show their understanding (Assessment Criteria) and the scope/range/contents in which they can be tested (Knowledge and Understanding).

Candidates are advised to prepare for each examination by covering all topics in the unit content so that they are able to provide comprehensive responses.

Assessment

Each unit is assessed separately by a 30 minute examination. The examinations are closed book and provide a summative assessment of the full range of learning specified in the unit content. There are 25 marks available in each examination. Each unit examination will consist of 10 questions on Fire and Fire Protection and 15 questions on the specialist topic.

Examinations are designed to ensure that all sections of the unit content are tested in each examination and to provide candidates with the opportunity to demonstrate their knowledge and understanding across the content specified in the unit.

Examinations are provided in English only.

In order to achieve a Pass, candidates will be required to attain 17 marks available to them via the 25 questions.

Qualification Learning Time

The length of time needed to complete the Level 2 Certificate in Passive Fire Protection will vary depending upon the starting point (i.e., previous knowledge and experience) for each individual.

Research suggests that most candidates should spend around 60 hours preparing for each unit although some candidates may wish to allocate a higher proportion of their preparation time to one or more units depending on their pre-existing knowledge.

Total qualification time is therefore 242 hours comprising:

- ◆ 240 hours (over 4 units) of study. Study may be self-study (please see the section on recommended reading below) and may include relevant training programmes.
- ◆ 2 hours (over 4 separate examinations of 30 minutes each) of assessment.

Candidates are advised to cross-map their study/training against the content of the unit to ensure that all parts of the unit have been covered. Recommended reading materials are listed below.

Certification

Unit Achievement

Each unit is assessed separately. In order to achieve a unit, candidates must obtain at least 17 marks out of the available 25 in the relevant examination.

Achievement is not graded. Successful candidates are issued with a unit document which recognises that candidates have passed the unit examination.

Certificate Achievement

In order to achieve the IFE Level 2 Certificate in Passive Fire Protection, candidates must achieve a Pass in all four mandatory unit award examinations. The qualification certificate is not graded. Successful candidates will be awarded a Pass Certificate.

Candidates do not need to achieve a Pass in all four units at the same examination session.

Candidates who achieve fewer than four components at one examination session will receive the relevant unit award(s).

Candidates must achieve all four units within five years to achieve the Level 2 Certificate in Passive Fire Protection. The five year period starts from 1 January of the year in which they take and pass their first examination. Candidates who take examinations in March 2023 and October 2023 will be able to combine these with passes from examinations that they sat in 2022, 2021, 2020 and 2019.

The IFE will automatically issue a full Level 2 Passive Fire Protection certificate at the point where candidates have achieved passes in all four of the units required.

Candidates may re-sit unit examinations as often as necessary in order to achieve a Pass.

Entry Requirements

There are no formal entry requirements. As the examination is provided in English only, candidates will need to have a comprehensive understanding of the English language in order to access the examination questions.

Qualification Level

This qualification has been designed to enable candidates to demonstrate their knowledge and understanding at Level 2. Other types of qualifications that are set at Level 2 include Level 2 NVQs, Level 2 Functional Skills and GCSE - grades 9, 8, 7, 6, 5, 4 or grades A*, A, B, C.

The qualifications regulator, Ofqual, has provided the following descriptors to illustrate the knowledge and understanding expected from those who hold qualifications at Level 2

Level 2 Knowledge descriptor

The holder of a qualification at Level 2:

- ◆ Has knowledge and understanding of facts, procedures and ideas in an area of study or field of work to complete well-defined tasks and address straightforward problems.
- ◆ Can interpret relevant information and ideas.
- ◆ Is aware of a range of information that is relevant to the area of study or work.

Candidates are advised to bear these descriptors in mind in preparing for examinations and when presenting responses during examinations.

Progression

Candidates who are successful in achieving the IFE Level 2 Certificate in Passive Fire Protection will be able to build on their learning and progress to the IFE Level 3 Certificate in Passive Fire Protection.

Recommended Reading

Candidates should be aware that this reading list is advisory rather than definitive.

Candidates should use the content of the units as their guide in deciding what reading materials they need to help them prepare for the examination – please see Content section below. The IFE recommends that all candidates should read widely in order to extend the depth and breadth of their knowledge and understanding.

The IFE has applied the following criteria in determining which resources should be included on this recommended reading list:

- ◆ the resource provides information which will be of benefit to the candidate in their professional life, providing depth and breadth of understanding;
- ◆ the resource contains some information that will be relevant to part of the syllabus;
- ◆ the resource is recognised by industry professionals as providing valuable information.

Candidates preparing for the examinations are advised to refer to the list below:

Title, Author and Publisher	Unit			
	1	2	3	4
Elementary Fire Engineering Handbook (IFE 50), Version issued 2017, available via IFE online shop or Google Books.	✓	✓	✓	✓
IFE Passive Fire Protection Resources - MyIFE > Home > Events and resources > Articles	✓	✓	✓	✓
ASFP Purple Book – Fire resisting partitions, 2nd Edition.		✓		
ASFP Black Book – Active Fire Curtains, 1 st edition.		✓		
ASFP Yellow Book – Fire Protection for Structural Protection in Buildings, Volume 1. 5 th edition.	✓			

ASFP Red Book – Fire Stopping, 4 th edition.			✓	
ASFP Blue Book – Fire Resisting Ductwork, 3 rd edition. Volume 1.			✓	
ASFP Grey Book – EN Fire Dampers, 2 nd edition.			✓	
ASFP Technical Guidance Document 11 COP for the specification & on-site installation of Intumescent Coating	✓			
Glass and Glazing Federation – A Guide to Best Practice in the Specification and Use of Fire Resistant Glazing		✓		
ASFP Technical Guidance Document TGD 8 Code of Practice for junctions between different fire protection systems			✓	
ASFP Guide to Passive Fire Protection for Fire Risk Assessors				✓
ASFP Ensuring Best Practice for Passive Fire Protection in Buildings	✓	✓	✓	✓
Approved Document B, Volume 1 – Dwellinghouses and Volume 2 – Buildings other than dwelling houses as amended in 2013	✓	✓	✓	✓
The British Woodworking Federation fire door installation training - https://firedoors.bwf.org.uk/knowledge-centre				✓
Emergency Lighting - https://www.iheem.org.uk/wp-content/uploads/2021/04/Emergency_Lighting_Pocket_Guide_June_2021.pdf	✓	✓	✓	✓
<u>Fire safety risk assessment: small and medium places of assembly</u>				✓
FIS Firestopping of Service Penetrations Best Practice in Design and Installation Firestopping of Service Penetrations - FIS (thefis.org)			✓	

Content

Section 1: Fire and Fire Protection

Note: this section will be included in all 4 unit award examinations.

1. Fire science including the chemistry of fire

Assessment Criteria	Knowledge and Understanding
1.1 Describe the fire triangle and the fire tetrahedron and explain the implications for extinguishing fire	• The fire triangle • Elements of the tetrahedron • Exothermic reaction • Principles involved in the extinction of fire by: ○ Smothering ○ Cooling ○ Starvation • Actions and media to remove elements in the fire triangle/tetrahedron - water, inert gas, foam, vaporising liquids, carbon dioxide and inert gases, dry chemical powders, blanketing, beating
1.2 Describe the process of fire development	• Fire as a chemical process • Stages of fire development: ○ Ignition (incipient) ○ Growth ○ Flashover ○ Fully developed ○ Decay
1.3 Identify and explain the dangers associated with smoke inhalation	• Particles • Vapours • Toxic gases

2. Human behaviour in a fire scenario

Assessment Criteria	Knowledge and Understanding
2.1 Describe the factors that affect behaviour when faced with a threat of fire in a building	• Knowledge of building layout • Regularity of the alarm being heard (e.g., history of false alarms/tests) • Fire drill discipline • Physical state of sleeping, under the influence of alcohol, medication, drugs • Whether able bodied or physically impaired • Friends or family in the building • Whether senses recognise danger e.g., smell, sight, hearing • Actions of others (i.e., herd instinct) • Clarity of fire exit signage • Panic
2.2 Understand the basic	Definition and understanding of the following terms:

principles of means of escape in case of fire	• Means of escape • Occupancy • Construction • Evacuation time • Travel distance • Escape route • Places of safety (reasonable and total) • Management control • Responsible person • Compartmentation
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3. Passive fire protection

Assessment Criteria	Knowledge and Understanding
3.1 Explain what is meant by the term “passive fire protection”	Passive fire protection: components materials and systems that go to make up or sit within the fabric of a building and which do not need any special energisation or command signal to operate
3.2 Describe the primary purpose of passive fire protection and explain how passive fire protection measures contribute to preventing and containing fire.	Control the spread of fire and smoke within a given fire compartment for a prescribed period of time

4. Building performance in fire

Assessment Criteria	Knowledge and Understanding
4.1 Describe factors that affect the fire resistance of a building and components within the building	• Loadbearing capacity – the ability of the building’s supports system to remain intact for a specified period of time • Integrity – ensuring that no gaps of sufficient size open up which allow penetration of hot gases, smoke and flames • Insulation – The fire insulation properties of the unexposed face of a compartment specifically to prevent an average rise of not more than 140deg C or a maximum rise of 180°C above ambient for the duration of the fire resistance period.

5. Active Fire Protection

Assessment Criteria	Knowledge and Understanding
5.1 Explain what is meant by the term “active fire protection”	• Active fire protection: systems that need special energisation or command signal to operate
5.2 Describe smoke and heat detection alarm systems that might be present	• Smoke detection systems and how they are activated ○ Ionisation smoke detectors ○ Optical smoke detectors ○ Aspirating smoke detectors

	○ Optical beam detectors • Heat detection systems and how they are activated ○ Fixed temperature heat detectors ○ Rate-of-rise detectors ○ Electronic sounders ○ Bell ○ Visual indicators ○ Voice alarms
5.3 Describe the firefighting equipment available within a building and explain its operation/use in tackling fire	• Portable fire extinguishers • Fire blankets • Wet and dry rising mains • Gaseous fire suppression systems
5.4 Describe the fire suppression equipment available within a building and explain its operation/use in extinguishing fire	• Sprinkler systems ○ Wet pipe ○ Dry pipe ○ Alternate ○ Pre-action • Deluge systems • Drenchers • Mist systems • Gaseous fire suppression systems • Portable fire extinguishers • Fire blankets
5.5 Explain how signage and emergency lighting is used to improve the fire safety in a building	• Types of signage • Signage location • Emergency lighting • Emergency lighting location

Unit 1: Building structural frame and flame retardant coatings

Introduction

This unit provides candidates with the opportunity to develop and demonstrate their understanding of Fire Protection to the structural frame of the building and flame retardant coatings. The content and structure of the qualification has been established to cover the basic knowledge and understanding required by those working in the passive fire protection industry.

Learning Outcomes

Candidates who achieve this qualification should be able to:

- ◆ Understand basic fire science and the role of passive fire protection in a holistic approach to fire safety in buildings
- ◆ Apply technical understanding to the structural frame of the building and flame retardant coatings.

Content

Note: A selection of questions from Section 1: Fire and Fire Protection (above) will be included in this examination.

Assessment Criteria	Knowledge and Understanding
1.1 Identify the factors affecting the fire resistance of concrete frames and describe the behaviour of concrete in fire	• Properties of concrete • Behaviour of structural concrete in fire • Cast-in concrete and precast concrete
1.2 Identify the factors affecting the fire resistance of timber frames and describe the behaviour of timber in fire	• Heavy timber construction • Lightweight timber framing • Sacrificial timber • Use and effect of fire resisting materials
1.3 Identify the factors affecting the fire resistance of steel frames and describe the behaviour of steel frames in fire	• Effect of heat • Effect of load • Effect of size (thickness) • Behaviour in fire
1.4 Describe fire resistant materials that can be applied to structural designs and explain factors affecting installation and performance	• Reactive (intumescent) paint coatings • Plaster or cementitious-based coating systems to structural steel sections • Cladding systems made from fire-resisting boards or stone wool products • Types of fire protection boards
1.5 Describe the processes for application/installation of protection methods and the processes for remedial and	• Profile • Box • Solid • Application/installation/maintenance of methods identified in 1.4 above

repair actions	• Factors effecting effectiveness of application/installation
1.6 Describe inspection and quality assurance processes	• Site inspections • Product inspection • Installation inspection • Ongoing maintenance

Unit 2: Walls, floors, ceilings and glazing

Introduction

This unit provides candidates with the opportunity to develop and demonstrate their understanding of Fire Protection to the structural frame of the building and flame retardant coatings. The content and structure of the qualification has been established to cover the basic knowledge and understanding required by those working in the passive fire protection industry.

Learning Outcomes

Candidates who achieve this qualification should be able to:

- ♦ Understand basic fire science and the role of passive fire protection in a holistic approach to fire safety in buildings
- ♦ Apply technical understanding to the fire resisting walls, floors and ceilings and fire resistant glazing

Content

Note: A selection of questions from Section 1: Fire and Fire Protection (above) will be included in this examination.

Assessment Criteria	Knowledge and Understanding
2.1 Describe the function, composition and performance characteristics of fire resisting walls, floors and ceilings	• Fire walls • Fire resisting floors • Compartment walls and floors • Fire resisting ceilings • Fire resisting partitions • Firefighting shafts and stairwells
2.2 Describe the function, composition and performance characteristics of active fire barrier systems	• Vertical active fire curtain barriers • Horizontal active fire curtain barriers • Folded or pleated fire curtain barriers
2.3 Describe the factors affecting the degree of fire resistance required	• The specified fire resistance period • Height of the top floor above ground and the intended use of the building • Whether fire resistance is expected from one side or both sides of the barrier • The type of fire performance required i.e., stability, integrity and insulation
2.4 Describe different glazing options and explain the factors to be considered when selecting and implementing options	• Integrity rated glazing ○ Wired glass ○ Laminated float glass ○ Modified toughened glass ○ Borosilicate glass ○ Glass ceramic ○ Partially insulating organic interlayer

	technology • Insulation rated glazing ◦ Water content gel interlayers between toughened glass plates • Laminated composites combining a hard intumescent interlayer between annealed glass
2.5 Explain how the framing and support structure affects the ability of glass to perform its function	• Timber frames • Steel and aluminium frames • Composite frames

Unit 3: Fire stopping, barriers, ductwork and dampers

Introduction

This unit provides candidates with the opportunity to develop and demonstrate their understanding of Fire Protection to the structural frame of the building and flame retardant coatings. The content and structure of the qualification has been established to cover the basic knowledge and understanding required by those working in the passive fire protection industry.

Learning Outcomes

Candidates who achieve this qualification should be able to:

- ◆ Understand basic fire science and the role of passive fire protection in a holistic approach to fire safety in buildings
- ◆ Apply technical understanding to fire stopping and penetration seals, cavity barriers, ductwork and dampers and the building envelope

Content

Note: A selection of questions from Section 1: Fire and Fire Protection (above) will be included in this examination.

Assessment Criteria	Knowledge and Understanding
3.1 Explain the purpose of fire stopping and describe the products and systems that may be used to achieve fire stopping	• Penetration seals • Linear joint seals • Small cavity barriers • Large cavity barriers • Open state cavity barriers
3.2 Explain the factors to be considered when selecting and installing fire stopping	• Fire resistance • Preventing conduction of temperatures along the service to the side isolated from the fire • Providing service supports • Use of penetration sealing systems • Use of loadbearing seals
3.3 Describe fire stopping and sealing systems and explain the factors relevant to their use and installation	• Horizontal cable tray penetration – mortars, plugs/blocks, bags / pillows • Horizontal pipe penetration - pipe closures (plastic pipes only), sealants (metal pipes only) • Sealing of blank opening – mortars, plugs/blocks, coated batts • Horizontal multiple penetration – mortars, plugs/blocks, coated batts • Temporary multiple horizontal penetration - bags / pillows. (note: if adequately supported some bags / pillows can also be used for vertical penetrations), plugs / blocks • Cable penetration – mortar, coated batts, sealants

	• Vertical duct penetration – mortar, mineral fibre and sealant/mastic • Vertical pipe penetration - pipe closures (plastic pipes only), sealants (metal pipes only) • Multiple penetrations (vertical and horizontal) – mortar, coated batts, pipe closures (plastic pipes only), sealants (metal pipes only), plugs/blocks • Vertical and horizontal cable penetration – mortar, coated batts • Movement joints – sealants, foam, preformed elastomeric seals, mineral fibre and sealant/mastic coatings • Horizontal duct penetration- mortar, mineral fibre and sealant/mastic • Fire (including cavity) barrier - coated batts, mineral wool curtains, woven textiles, ridged boards
3.4 Describe the uses of ductwork and explain the considerations in relation to selection and installations of fire-resistant ducting.	• Range of uses: ventilation, smoke extract, kitchen extract and pressurisation • Criteria applied to fire resisting ductwork: stability, integrity, insulation
3.5 Explain the methods used to maintain the fire resistance of walls and floors penetrated by ventilation ducts	• Fire dampers • Fire resisting enclosures • Fire resisting ductwork (including types of ductwork)
3.6 Describe the use of different types of dampers and explain the considerations in the selection and installation fire damper systems	• Curtain fire dampers • Intumescent fire dampers • Multi-blade fire dampers • Single blade fire dampers • Multi-section dampers • Leakage classified fire dampers • Insulated fire dampers • Smoke control damper • Fusible link
3.7 Describe the factors that affect the construction and design of the building envelope and the implications for fire protection.	• Fire-resisting external walls • Curtain walling systems • Cladding systems • Insulation applied to outside of buildings • Façade

Unit 4: Doors and shutters

Introduction

This unit provides candidates with the opportunity to develop and demonstrate their understanding of Fire Protection to the structural frame of the building and flame retardant coatings. The content and structure of the qualification has been established to cover the basic knowledge and understanding required by those working in the passive fire protection industry.

Learning Outcomes

Candidates who achieve this qualification should be able to:

- ◆ Understand basic fire science and the role of passive fire protection in a holistic approach to fire safety in buildings
- ◆ Apply technical understanding to fire resisting doors, industrial shutters and associated hardware

Content

Note: A selection of questions from Section 1: Fire and Fire Protection (above) will be included in this examination.

Assessment Criteria	Knowledge and Understanding
4.1 Explain the role of fire doors and shutters and describe the construction of different types of door and shutter	• Different uses and protection against different hazards • Operation of doors – door closing devices, electrically powered hold open devices, door co-ordinator devices, exit devices • Difference between door assemblies and doorsets • Materials used in construction • Implications of errors in installing or maintaining fire doors • Locations where fire doors should be fitted
4.2 Describe the components of a fire doorset or assembly	• Door leaf • Door frame • Door ironmongery • Air transfer grills • Intumescent seals • Smoke seals • Glazing apertures • Signage
4.3 Describe the factors relevant to fire door installation	• Delivery and storage prior to installation • Checks • Finishing doors on site/coatings • Fitting the frame, door leaf, ironmongery, seals • Post installation checks
4.4 Explain the considerations in relation to the ongoing use of fire	• Ongoing wear and tear

doorsets and assemblies	• Maintenance • Inspection regime
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