

IFE Level 2 Award in Passive Fire Protection: Building structural frame and flame retardant coatings

Qualification Specification

Qualification Number: 610/4855/0

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 Award in Passive Fire Protection: Building structural frame and flame retardant coatings

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 Content

The content of the Award is set out in the information presented below. The relevant sections below provide information on the range of topics that must be studied to achieve the Award 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

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

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 Award in Passive Fire Protection: Building structural frame and flame retardant coatings 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 the examination 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 60.5 hours comprising:

- ◆ 60 hours of study. Study may be self-study (please see the section on recommended reading below) and may include relevant training programmes.
- ◆ 30 minutes 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

Achievement

In order to achieve the Award, 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 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 Award in Passive Fire Protection: Building structural frame and flame retardant coatings will be able to build on their learning and progress to the remaining Awards to achieve the IFE Level 2 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 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 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

Building structural frame and flame retardant coatings

Introduction

This Award 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 repair actions	• Profile • Box • Solid • Application/installation/maintenance of methods identified in 1.4 above • Factors effecting effectiveness of

	application/installation
1.6 Describe inspection and quality assurance processes	• Site inspections • Product inspection • Installation inspection • Ongoing maintenance