

IFE Level 3 Certificate in Passive Fire Protection

Exam Report on March 2025 Examination

Introduction

This report presents an analysis of candidate performance in the IFE Level 3 Certificate in Passive Fire Protection for the March 2025 examination session. The exam consists of multiple-choice questions drawn from a structured question bank, ensuring comprehensive coverage of key competencies.

Please note: all statistics have been rounded to the nearest integer.

Overall Performance

- Pass Rate: 84%
- Average Score: 50
- Score Required for Pass: 45

Performance by Assessment Criteria

(Average percentage of correct answers per assessment criterion)

The highest-scoring assessment criterion was **3.1 Explain what is meant by the term “passive fire protection”** with an average score of 97%.

The lowest-scoring assessment criterion was **3.4 Describe the uses of ductwork and explain the considerations in relation to selection and installations of fire-resistant ducting** with an average score of 48%, indicating an area where candidates may require additional focus.

Fire and Fire Protection

1. Fire science including the chemistry of fire

Assessment Criteria	Knowledge and Understanding	Average Score
1.1 Describe the fire triangle and the fire tetrahedron and explain the implications for extinguishing fire	• The fire triangle • Elements of the tetrahedron - oxygen, heat, fuel and chemical chain reaction • Exothermic reaction • Principles involved in the extinction of fire by: ○ smothering ○ cooling ○ starvation • Actions and media to remove elements in the fire triangle - water, inert gas, foam, vaporising liquids, carbon dioxide and inert gases, dry chemical powders, blanketing, beating	83%

1.2 Describe the process of fire development and explain how this can be affected by passive fire protection	• Fire as a chemical process • Combustion – smouldering and flaming • Stages of fire development: ○ Ignition (incipient) ○ Growth ○ Flashover ○ Fully developed ○ Decay	71%
1.3 Identify and explain the dangers associated with smoke inhalation	• Particles • Vapours • Toxic gases, including carbon monoxide and hydrogen cyanide, and their effects	78%

2. Human behaviour in a fire scenario

Assessment Criteria	Knowledge and Understanding	Average Score
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 and/or mentally 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	72%
2.2 Define and understand the basic 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 • Compartmentation	92%

3. Passive fire protection

Assessment Criteria	Knowledge and Understanding	Average Score
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	97%
3.2 Explain the primary purpose of passive fire protection and explain how passive fire protection can contribute to the prevention and/or extinguishment of fire	- To control the spread of fire and smoke within a given fire compartment for a prescribed period of time - Contribution of different passive fire protection measures in preventing and limiting fire at different stages of fire growth	86%

4. Building performance in fire

Assessment Criteria	Knowledge and Understanding	Average Score
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.	85%
4.2 Explain the factors that affect the way a material behaves in fire	Measured in terms of how the material will: - ignite - spread flame (over their surface) - release heat (rate of/fire propagation) - be combustible to any extent at all - produce flaming droplets and smoke (not used in UK regulations)	57%

5. Fire testing, assessment and product certification process

Assessment Criteria	Knowledge and Understanding	Average Score
5.1 Describe fire testing procedures and explain limitations of testing	• Practicalities of testing in every possible circumstance • Assessments undertaken by laboratories • Importance of documentation specifying the testing that has taken place	79%
5.2 Describe the evidence used to support manufacturers' products in the market	• Certification from a Third-Party Certification Body • Assessment / Expert Judgment from an accredited fire test laboratory or suitably qualified fire consultant • A fire test report	90%

6. Development and implementation of a fire strategy for a building

Assessment Criteria	Knowledge and Understanding	Average Score
6.1 Explain why it is important to establish a fire strategy as part of the initial brief for a building	• Determine objective e.g. to protect people from a fire within the building, to allow adequate time to escape, to protect the building and its contents from a fire • Integral to building design • Installation – plan for correct order and to the correct standard	93%
6.2 Describe roles and responsibilities and their impact on fire safety	• Contractors • Specialist sub-contractors • Regulators • Fire risk assessor • Client/Occupier	80%
6.3 Describe the actions to ensure that the fire provision of the building is maintained	• Monitoring of activities that might affect fire performance e.g. amendments to building and maintenance work that could breach essential fire compartmentation • Use of correct materials and qualified contractors to carry out any maintenance work • Reviews following changes in the use of the building • Ongoing checks for wear and tear and adherence to procedures and standards • Fire Risk Assessment	79%

7. Active Fire Protection

Assessment Criteria	Knowledge and Understanding	Average Score
7.1 Explain what is meant by the term “active fire protection” and explain how active fire protection differs from passive fire protection	Active fire protection: systems that need special energisation or command signal to operate	88%
7.2 Describe smoke and heat detection alarm systems and explain how these may be activated	• Smoke detection ○ Ionisation smoke detectors ○ Optical smoke detectors ○ Aspirating smoke detectors ○ Optical beam detectors • Heat detection ○ Fixed temperature heat detectors ○ Rate-of-rise detectors • Alarm systems ○ Electronic sounders ○ Bell ○ Visual indicators ○ Voice alarms	76%
7.3 Describe different types of firefighting equipment available within a building and explain its operation/use in tackling fire	• Portable fire extinguishers • Fire blankets • Wet and dry rising mains	82%
7.4 Describe different types of fire suppression equipment available within a building and explain its operation/use in extinguishing fire	• Sprinkler systems • Deluge systems • Mist systems • Drenchers • Gaseous fire suppression systems	62%
7.5 Explain how signage and emergency lighting is used to improve the fire safety in a building	• Signage • Signage location • Emergency lighting • Emergency lighting location	87%

Installation of Passive Fire Protection Measures

1. Fire protection to the structural frame of the building and fire retardant coatings

Assessment Criteria	Knowledge and Understanding	Average Score
1.1 Explain the factors affecting the fire resistance of concrete frames and describe the additional passive fire protection measures that may be considered	• Most designed to specific fire resistance period and no need for additional protection • Spalling – circumstances where this may be an issue and actions to protect structure	80%
1.2 Explain the factors affecting the fire resistance of timber frames and describe the additional passive fire protection measures that may be considered	• Heavy timber construction ◦ Glulam or other similarly fabricated beams ◦ sacrificial timber • Lightweight timber framing ◦ requires additional fire protection, usually by a board system	80%
1.3 Explain the factors affecting the fire resistance of steel frames and describe the additional passive fire protection measures that may be considered	• Steel will lose safety margin at around 550°C but varies depending on load and temperature profile • Thicker and heavier steel section will take longer to heat • Insulation to counter the rise in temperature	77%
1.4 Describe fire resistant materials that can be applied to structural designs and the quality and inspection processes to be applied during the application process	• 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 • Processes for application/installation of different products • Inspection process	75%
1.5 Explain the issues to be taken into account when determining choice of fire protection system for different purposes	Issues for consideration • Junctions between different fire protection systems • Level of fire rating required • Appearance/Aesthetics • Environmental conditions • Robustness • Potential future adaptations • Whether developed on-site or off-site • Correct installation	81%

	• Guidance from manufacturers • Testing and meeting appropriate standards • Regulatory requirements	
1.6 Describe the way in which fire retardant coating systems affect the performance of building materials	• Materials to include: ○ Hardwoods ○ Softwoods ○ Chipboard ○ Medium density fibreboard (MDF) • Impact on spread of flame • Impact on fire propagation • Methods to retard the combustion process • Impregnation and surface coating treatments	61%

2. Fire resisting walls, floors and ceilings and fire resistant glazing

Assessment Criteria	Knowledge and Understanding	Average Score
2.1 Describe the function, composition and performance characteristics of fire resisting walls, floors and ceilings and of active fire barrier systems	• Fire walls • Fire resisting floors • Compartment walls and floors • Fire resisting ceilings • Fire resisting partitions • Active fire barrier systems • Firefighting shafts and stairwells	86%
2.2 Explain the factors affecting fire performance	• The specified fire resistance period • Whether fire resistance is expected from one side of both sides of the barrier • The type of fire performance required i.e., stability, integrity and insulation	83%
2.3 Identify and explain factors to be considered in incorporating compartmentation into building design and ensuring that compartmentation remains effective over time	• Local building regulations/codes • Internal designs/client brief • Ensuring that fire is unable to penetrate for the prescribed period of time • Level of fire rating required • Robustness (impact damage) • Consideration of future adaptations (future penetration of the fire resisting wall/floor due to new services installation) • Access for future inspection	83%
2.4 Describe how glass behaves in fire and describe the use of glass in fire resisting situations	• Non-fire rated glass • Fire integrity under the classification “E”/ Fire protective glazing • Fire integrity with limited heat radiation capability under the classification “EW” • Fire integrity with full radiant fire insulating capability under the classification “EI”	78%

2.5 Explain how the framing and support structure affects the ability of glass to perform its function and explain the factors to be considered when specifying and installing fire resistant glazing	• Timber frames • Steel and aluminium frames • Composite frames	62%
2.6 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	63%

3. Fire stopping and penetration seals, cavity barriers, ductwork and dampers and the building envelope

Assessment Criteria	Knowledge and Understanding	Average Score
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	73%
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	77%
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	61%

	• 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	48%
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) • Automatically actuated fire and smoke dampers triggered by smoke detectors	72%
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	86%

3.7 Explain the factors that affect the construction and design of the building envelope and the implications for building in fire protection	• Fire-resisting external walls • Curtain walling systems • Cladding systems • Insulation applied to outside of buildings	66%
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4. Fire resisting doors and hardware

Assessment Criteria	Knowledge and Understanding	Average Score
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	74%
4.2 Describe the components of a fire doorset or assembly and explain the considerations in relation to selection, installation and testing	• Door leaf • Door frame • Door ironmongery • Air transfer grills • Intumescent seals • Smoke seals • Glazing apertures • Signage	78%
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	72%
4.4 Explain the considerations in relation to the use of fire doorsets and assemblies	• Ongoing wear and tear • Maintenance and inspection regime • Third party certification	72%